NOTATION

The following is a list of acronyms and abbreviations, chemical names, and units of measure used in this document. Some acronyms used only in tables may be defined only in those tables.

GENERAL ACRONYMS AND ABBREVIATIONS

AADT	annual average daily traffic
AASHTO	American Association of State Highway and Transportation Officials
AC	alternating current
ACC	air-cooled condenser
ACEC	Area of Critical Environmental Concern
ADEQ	Arizona Department of Environmental Quality
ACHP	Advisory Council on Historic Preservation
ADOT	Arizona Department of Transportation
ADWR	Arizona Department of Water Resources
AERMOD	AMS/EPA Regulatory Model
AFC	Application for Certification
AGL	above ground level
AIM	Assessment, Inventory and Monitoring
AIRFA	American Indian Religious Freedom Act
AMA	active management area
AML	animal management level
ANHP	Arizona National Heritage Program
APE	area of potential effect
APLIC	Avian Power Line Interaction Committee
APP	Avian Protection Plan
APS	Arizona Public Service
AQCR	Air Quality Control Region
AQRV	air quality–related value
ARB	Air Resources Board
ARRA	American Recovery and Reinvestment Act of 2009
ARRTIS	Arizona Renewable Resource and Transmission Identification Subcommittee
ARS	Agricultural Research Service
ARZC	Arizona and California
ATSDR	Agency for Toxic Substances and Disease Registry
AUM	animal unit month
AVSE	Arlington Valley Solar Energy
AVWS	Audio Visual Warning System
AWBA	Arizona Water Banking Authority
AWEA	American Wind Energy Association
AWRM	Active Water Resource Management
AZDA	Arizona Department of Agriculture
AZGFD	Arizona Game and Fish Department

AZGS	Arizona Geological Survey
BA	biological assessment
BAP	base annual production
BEA	Bureau of Economic Analysis
BISON-M	Biota Information System of New Mexico
BLM	Bureau of Land Management
BLM-CA	Bureau of Land Management, California
BMP	best management practice
BNSF	Burlington Northern Santa Fe
BO	biological opinion
BOR	U.S. Bureau of Reclamation
BPA	Bonneville Power Administration
BRAC	Blue Ribbon Advisory Council on Climate Change
BSE	Beacon Solar Energy
BSEP	Beacon Solar Energy Project
BTS	Bureau of Transportation Statistics
CAA	Clean Air Act
CAAQS	California Air Quality Standards
CAISO	California Independent System Operator
Caltrans	California Department of Transportation
C-AMA	California-Arizona Maneuver Area
CAP	Central Arizona Project
CARB	California Air Resources Board
CAReGAP	California Regional Gap Analysis Project
CASQA	California Stormwater Quality Association
CASTNET	Clean Air Status and Trends NETwork
CAWA	Colorado Agricultural Water Alliance
CCC	Civilian Conservation Corps
CDC	Centers for Disease Control and Prevention
CDCA	California Desert Conservation Area
CDFG	California Department of Fish and Game
CDNCA	California Desert National Conservation Area
CDOT	Colorado Department of Transportation
CDOW	Colorado Division of Wildlife (now Colorado Parks and Wildlife)
CDPHE	Colorado Department of Public Health and Environment
CDWR	California Department of Water Resources
CEC	California Energy Commission
CEQ	Council on Environmental Quality
CES	constant elasticity of substitution
CESA	California Endangered Species Act
CESF	Carrizo Energy Solar Farm
CFR	*Code of Federal Regulations*
CGE	computable general equilibrium
CHAT	crucial habitat assessment tool

CIRA	Cooperative Institute for Research in the Atmosphere
CLFR	compact linear Fresnel reflector
CNDDB	California Natural Diversity Database
CNEL	community noise equivalent level
CNHP	Colorado National Heritage Program
Colorado DWR	Colorado Division of Water Resources
CO_2e	carbon dioxide equivalent
CPC	Center for Plant Conservation
CPUC	California Public Utilities Commission
CPV	concentrating photovoltaic
CRBSCF	Colorado River Basin Salinity Control Forum
CREZ	competitive renewable energy zone
CRPC	Cultural Resources Preservation Council
CRSCP	Colorado River Salinity Control Program
CSA	Candidate Study Area
CSC	Coastal Services Center
CSFG	carbon-sequestration fossil generation
CSP	concentrating solar power
CSQA	California Stormwater Quality Association
CSRI	Cultural Systems Research, Incorporated
CTG	combustion turbine generator
CTPG	California Transmission Planning Group
CTSR	Cumbres & Toltec Scenic Railroad
CUP	Conditional Use Permit
CVP	Central Valley Project
CWA	Clean Water Act
CWCB	Colorado Water Conservation Board
CWHRS	California Wildlife Habitat Relationship System
DC	direct current
DEM	digital elevation model
DHS	U.S. Department of Homeland Security
DIMA	Database for Inventory, Monitoring and Assessment
DLT	dedicated-line transmission
DNA	Determination of NEPA Adequacy
DNI	direct normal insulation
DNL	day-night average sound level
DoD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOI	U.S. Department of the Interior
DOL	U.S. Department of Labor
DOT	U.S. Department of Transportation
DRECP	California Desert Renewable Energy Conservation Plan
DSM	demand-side management
DSRP	Decommissioning and Site Reclamation Plan
DTC/C-AMA	Desert Training Center/California–Arizona Maneuver Area

DWMA	Desert Wildlife Management Area
DWR	Division of Water Resources
EA	environmental assessment
EBID	Elephant Butte Irrigation District
ECAR	East Central Area Reliability Coordination Agreement
ECOS	Environmental Conservation Online System (USFWS)
EERE	Energy Efficiency and Renewable Energy (DOE)
Eg	band gap energy
EIA	Energy Information Administration (DOE)
EIS	environmental impact statement
EISA	Energy Independence and Security Act of 2007
EMF	electromagnetic field
E.O.	Executive Order
EPA	U.S. Environmental Protection Agency
EPRI	Electric Power Research Institute
EQIP	Environmental Quality Incentives Program
ERCOT	Electric Reliability Council of Texas
ERO	Electric Reliability Organization
ERS	Economic Research Service
ESA	Endangered Species Act of 1973
ESRI	Environmental Systems Research Institute
FAA	Federal Aviation Administration
FBI	Federal Bureau of Investigation
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FLPMA	Federal Land Policy and Management Act of 1976
FONSI	Finding of No Significant Impact
FR	*Federal Register*
FRCC	Florida Reliability Coordinating Council
FSA	Final Staff Assessment
FTE	full-time equivalent
FY	fiscal year
G&TM	generation and transmission modeling
GCRP	U.S. Global Climate Research Program
GDA	generation development area
GHG	greenhouse gas
GIS	geographic information system
GMU	game management unit
GPS	global positioning system
GTM	Generation and Transmission Model

GUAC	Groundwater Users Advisory Council
GWP	global warming potential
HA	herd area
HAP	hazardous air pollutant
HAZCOM	hazard communication
HCE	heat collection element
HCP	Habitat Conservation Plan
HMA	herd management area
HMMH	Harris Miller Miller & Hanson, Inc.
HRSG	heat recovery steam generator
HSPD	Homeland Security Presidential Directive
HTF	heat transfer fluid
HUC	hydrologic unit code
HVAC	heating, ventilation, and air-conditioning
I	Interstate
IARC	International Agency for Research on Cancer
IBA	important bird area
ICE	internal combustion engine
ICPDS	Imperial County Planning & Development Services
ICWMA	Imperial County Weed Management Area
IDT	interdisplinary team
IEC	International Electrochemical Commission
IFR	instrument flight rule
IID	Imperial Irrigation District
IM	Instruction Memorandum
IMPS	Iron Mountain Pumping Station
IMS	interim mitigation strategy
INA	Irrigation Non-Expansion Area
IOP	Interagency Operating Procedure
IOU	investor-owned utility
IPCC	Intergovernmental Panel on Climate Change
ISA	Independent Science Advisor; Instant Study Area
ISB	Intermontane Seismic Belt
ISCC	integrated solar combined cycle
ISDRA	Imperial Sand Dunes Recreation Area
ISEGS	Ivanpah Solar Energy Generating System
ISO	independent system operator; iterative self-organizing
ITFR	Interim Temporary Final Rulemaking
ITP	incidental take permit
IUCNNR	International Union for Conservation of Nature and Natural Resources
IUCNP	International Union for Conservation of Nature Pakistan
KGA	known geothermal resources area
KML	keyhole markup language

KOP	key observation point
KSLA	known sodium leasing area
LCC	Landscape Conservation Cooperative
LCCRDA	Lincoln County Conservation, Recreation, and Development Act of 2004
LCOE	levelized cost of energy
L_{dn}	day-night average sound level
LDWMA	Low Desert Weed Management Area
L_{eq}	equivalent sound pressure level
LiDAR	light detection and ranging
LLA	limited land available
LLRW	low-level radioactive waste (waste classification)
LPN	listing priority number
LRG	Lower Rio Grande
LSA	lake and streambed alteration
LSE	load-serving entity
LTMP	long-term monitoring and adaptive management plan
LTVA	long-term visitor area
MAAC	Mid-Atlantic Area Council
MAIN	Mid-Atlantic Interconnected Network
MAPP	methyl acetylene propadiene stabilizer; Mid-Continent Area Power Pool
MCAS	Marine Corps Air Station
MCL	maximum contaminant level
MEB	Marine Expeditionary Brigade
MFP	Management Framework Plan
MIG	Minnesota IMPLAN Group
MLA	maximum land available
MOA	military operating area
MOU	Memorandum of Understanding
MPDS	maximum potential development scenario
MRA	Multiple Resource Area
MRI	Midwest Research Institute
MRO	Midwest Reliability Organization
MSDS	Material Safety Data Sheet
MSL	mean sea level
MTR	military training route
MVEDA	Mesilla Valley Economic Development Alliance
MWA	Mojave Water Agency
MWD	Metropolitan Water District
MWMA	Mojave Weed Management Area
NAAQS	National Ambient Air Quality Standard(s)
NADP	National Atmospheric Deposition Program
NAGPRA	Native American Graves Protection and Repatriation Act
NAHC	Native American Heritage Commission (California)
NAIC	North American Industrial Classification System

NASA	National Aeronautics and Space Administration
NCA	National Conservation Area
NCCAC	Nevada Climate Change Advisory Committee
NCDC	National Climatic Data Center
NCES	National Center for Education Statistics
NDAA	National Defense Authorization Act
NDCNR	Nevada Department of Conservation and Natural Resources
NDEP	Nevada Division of Environmental Protection
NDOT	Nevada Department of Transportation
NDOW	Nevada Department of Wildlife
NDWP	Nevada Division of Water Planning
NDWR	Nevada Division of Water Resources
NEAP	Natural Events Action Plan
NEC	National Electric Code
NED	National Elevation Database
NEP	Natural Events Policy
NEPA	National Environmental Policy Act of 1969
NERC	North American Electricity Reliability Corporation
NGO	non-governmental organization
NHA	National Heritage Area
NHD	National Hydrography Dataset
NHNM	National Heritage New Mexico
NHPA	National Historic Preservation Act of 1966
NID	National Inventory of Dams
NLCS	National Landscape Conservation System
NMAC	*New Mexico Administrative Code*
NMBGMR	New Mexico Bureau of Geology and Mineral Resources
NMDGF	New Mexico Department of Game and Fish
NM DOT	New Mexico Department of Transportation
NMED	New Mexico Environment Department
NMED-AQB	New Mexico Environment Department-Air Quality Board
NMFS	National Marine Fisheries Service
NMOSE	New Mexico Office of the State Engineer
NMSU	New Mexico State University
NNHP	Nevada Natural Heritage Program
NNL	National Natural Landmark
NNSA	National Nuclear Security Administration
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NP	National Park
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NPS	National Park Service
NPV	net present value
NRA	National Recreation Area

NRCS	Natural Resources Conservation Service
NREL	National Renewable Energy Laboratory
NRHP	*National Register of Historic Places*
NRS	*Nevada Revised Statutes*
NSC	National Safety Council
NSO	no surface occupancy
NSTC	National Science and Technology Council
NTHP	National Trust for Historic Preservation
NTS	Nevada Test Site
NTTR	Nevada Test and Training Range
NVCRS	Nevada Cultural Resources Inventory System
NV DOT	Nevada Department of Transportation
NWCC	National Wind Coordinating Committee
NWI	National Wetlands Inventory
NWIS	National Water Information System (USGS)
NWPP	Northwest Power Pool
NWR	National Wildlife Refuge
NWSRS	National Wild and Scenic River System
O&M	operation and maintenance
ODFW	Oregon Department of Fish and Wildlife
OHV	off-highway vehicle
ONA	Outstanding Natural Area
ORC	organic Rankine cycle
OSE/ISC	Office of the State Engineer/Interstate Stream Commission
OSHA	Occupational Safety and Health Administration
OTA	Office of Technology Assessment
PA	Programmatic Agreement
PAD	Preliminary Application Document
PAH	polycyclic aromatic hydrocarbon
PAT	peer analysis tool
PCB	polychlorinated biphenyl
PCM	purchase change material
PCS	power conditioning system
PCU	power converting unit
PEIS	programmatic environmental impact statement
PFYC	potential fossil yield classification
PGH	Preliminary General Habitat
PIER	Public Interest Energy Research
P.L.	Public Law
PLSS	Public Land Survey System
PM	particulate matter
$PM_{2.5}$	particulate matter with a diameter of 2.5 μm or less
PM_{10}	particulate matter with a diameter of 10 μm or less
PPA	Power Purchase Agreement

P-P-D	population-to-power density
PPH	Preliminary Priority Habitat
POD	plan of development
POU	publicly owned utility
PPA	Power Purchase Agreement
PPE	personal protective equipment
PSD	Prevention of Significant Deterioration
PURPA	Public Utility Regulatory Policy Act
PV	photovoltaic
PVID	Palo Verde Irrigation District
PWR	public water reserve
QRA	qualified resource area
R&I	relevance and importance
RAC	Resource Advisory Council
RCE	Reclamation Cost Estimate
RCI	residential, commercial, and industrial (sector)
RCRA	Resource Conservation and Recovery Act of 1976
RD&D	research, development, and demonstration; research, development, and deployment
RDBMS	Relational Database Management System
RDEP	Restoration Design Energy Project
REA	Rapid Ecoregional Assessment
REAT	Renewable Energy Action Team
REDA	Renewable Energy Development Area
REDI	Renewable Energy Development Infrastructure
REEA	Renewable Energy Evaluation Area
ReEDS	Regional Energy Deployment System
REPG	Renewable Energy Policy Group
RETA	Renewable Energy Transmission Authority
RETAAC	Renewable Energy Transmission Access Advisory Committee
RETI	Renewable Energy Transmission Initiative
REZ	renewable energy zone
RF	radio frequency
RFC	Reliability First Corporation
RFDS	reasonably foreseeable development scenario
RGP	Rio Grande Project
RGWCD	Rio Grande Water Conservation District
RMP	Resource Management Plan
RMPA	Rocky Mountain Power Area
RMZ	Resource Management Zone
ROD	Record of Decision
ROI	region of influence
ROS	recreation opportunity spectrum
ROW	right-of-way

RPG	renewable portfolio goal
RPS	Renewable Portfolio Standard
RRC	Regional Reliability Council
RSEP	Rice Solar Energy Project
RSI	Renewable Systems Interconnection
RTO	regional transmission organization
RTTF	Renewable Transmission Task Force
RV	recreational vehicle
SAAQS	State Ambient Air Quality Standard(s)
SAMHSA	Substance Abuse and Mental Health Services Administration
SCADA	supervisory control and data acquisition
SCE	Southern California Edison
SCRMA	Special Cultural Resource Management Area
SDRREG	San Diego Regional Renewable Energy Group
SDWA	Safe Drinking Water Act of 1974
SEGIS	Solar Energy Grid Integration System
SEGS	Solar Energy Generating System
SEI	Sustainable Energy Ireland
SEIA	Solar Energy Industrial Association
SES	Stirling Energy Systems
SETP	Solar Energy Technologies Program (DOE)
SEZ	solar energy zone
SHPO	State Historic Preservation Office(r)
SIP	State Implementation Plan
SLRG	San Luis & Rio Grande
SMA	Special Management Area
SMART	specific, measurable, achievable, relevant, and time sensitive
SMP	suggested management practice
SNWA	Southern Nevada Water Authority
SPP	Southwest Power Pool
SRMA	Special Recreation Management Area
SSA	Socorro Seismic Anomaly
SSI	self-supplied industry
ST	solar thermal
STG	steam turbine generator
SUA	special use airspace
SWAT	Southwest Area Transmission
SWIP	Southwest Intertie Project
SWPPP	Stormwater Pollution Prevention Plan
SWReGAP	Southwest Regional Gap Analysis Project
TAP	toxic air pollutant
TCC	Transmission Corridor Committee
TDS	total dissolved solids
TEPPC	Transmission Expansion Planning Policy Committee

TES	thermal energy storage
TRACE	Transmission Routing and Configuration Estimator
TSA	Transportation Security Administration
TSCA	Toxic Substances Control Act of 1976
TSDF	treatment, storage, and disposal facility
TSP	total suspended particulates
UACD	Utah Association of Conservation Districts
UBWR	Utah Board of Water Resources
UDA	Utah Department of Agriculture
UDEQ	Utah Department of Environmental Quality
UDNR	Utah Department of Natural Resources
UDOT	Utah Department of Transportation
UDWQ	Utah Division of Water Quality
UDWR	Utah Division of Wildlife Resources
UGS	Utah Geological Survey
UNEP	United Nations Environmental Programme
UNPS	Utah Native Plant Society
UP	Union Pacific
UREZ	Utah Renewable Energy Zone
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USC	*United States Code*
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
Utah DWR	Utah Division of Water Rights
UTTR	Utah Test and Training Range
UWS	Underground Water Storage, Savings and Replenishment Act
VACAR	Virginia–Carolinas Subregion
VCRS	Visual Contrast Rating System
VFR	visual flight rule
VOC	volatile organic compound
VRHCRP	Virgin River Habitat Conservation & Recovery Program
VRI	Visual Resource Inventory
VRM	Visual Resource Management
WA	Wilderness Area
WECC	Western Electricity Coordinating Council
WECC CAN	Western Electricity Coordinating Council–Canada
WEG	wind erodibility group
Western	Western Area Power Administration
WGA	Western Governors' Association
WGFD	Wyoming Game and Fish Department

WHA	wildlife habitat area
WHO	World Health Organization
WIA	Wyoming Infrastructure Authority
WRAP	Water Resources Allocation Program; Western Regional Air Partnership
WRCC	Western Regional Climate Center
WREZ	Western Renewable Energy Zones
WRRI	Water Resources Research Institute
WSA	Wilderness Study Area
WSC	wildlife species of special concern
WSMR	White Sands Missile Range
WSR	Wild and Scenic River
WSRA	Wild and Scenic Rivers Act of 1968
WWII	World War II
WWP	Western Watersheds Project
YPG	Yuma Proving Ground
ZITA	zone identification and technical analysis
ZLD	zero liquid discharge

CHEMICALS

CH_4	methane	NO_2	nitrogen dioxide
CO	carbon monoxide	NO_x	nitrogen oxides
CO_2	carbon dioxide		
		O_3	ozone
H_2S	hydrogen sulfide		
Hg	mercury	Pb	lead
N_2O	nitrous oxide	SF_6	sulfur hexafluoride
NH_3	ammonia	SO_2	sulfur dioxide
		SO_x	sulfur oxides

UNITS OF MEASURE

ac-ft	acre-foot (feet)	dBA	A-weighted decibel(s)
bhp	brake horsepower		
		°F	degree(s) Fahrenheit
°C	degree(s) Celsius	ft	foot (feet)
cf	cubic foot (feet)	ft^2	square foot (feet)
cfs	cubic foot (feet) per second	ft^3	cubic foot (feet)
cm	centimeter(s)		
		g	gram(s)
dB	decibel(s)	gal	gallon(s)

GJ	gigajoule(s)
gpcd	gallon per capita per day
gpd	gallon(s) per day
gpm	gallon(s) per minute
GW	gigawatt(s)
GWh	gigawatt hour(s)
GWh/yr	gigawatt hour(s) per year
h	hour(s)
ha	hectare(s)
Hz	hertz
in.	inch(es)
J	joule(s)
K	degree(s) Kelvin
kcal	kilocalorie(s)
kg	kilogram(s)
kHz	kilohertz
km	kilometer(s)
km^2	square kilometer(s)
kPa	kilopascal(s)
kV	kilovolt(s)
kVA	kilovolt-ampere(s)
kW	kilowatt(s)
kWh	kilowatt-hour(s)
kWp	kilowatt peak
L	liter(s)
lb	pound(s)
m	meter(s)
m^2	square meter(s)
m^3	cubic meter(s)
mg	milligram(s)
Mgal	million gallons
mi	mile(s)
mi^2	square mile(s)
min	minute(s)
mm	millimeter(s)
MMt	million metric ton(s)
MPa	megapascal(s)
mph	mile(s) per hour
MVA	megavolt-ampere(s)
MW	megawatt(s)
MWe	megawatt(s) electric
MWh	megawatt-hour(s)
ppm	part(s) per million
psi	pound(s) per square inch
psia	pound(s) per square inch absolute
rpm	rotation(s) per minute
s	second(s)
scf	standard cubic foot (feet)
TWh	terawatt hour(s)
VdB	vibration velocity decibel(s)
W	watt(s)
yd^2	square yard(s)
yd^3	cubic yard(s)
yr	year(s)
µg	microgram(s)
µm	micrometer(s)

9 UPDATE TO AFFECTED ENVIRONMENT AND IMPACT ASSESSMENT FOR PROPOSED SOLAR ENERGY ZONES IN CALIFORNIA

The U.S. Department of the Interior Bureau of Land Management (BLM) has carried 17 solar energy zones (SEZs) forward for analysis in this Final Solar Programmatic Environmental Impact Statement (PEIS). These SEZs total approximately 285,000 acres (1,153 km^2) of land potentially available for development. This chapter includes analyses of potential environmental impacts for the proposed SEZs in California, Imperial East and Riverside East, as well as summaries of the Iron Mountain and Pisgah SEZs and why they were eliminated from further consideration. The SEZ-specific analyses provide documentation from which the BLM will tier future project authorizations, thereby limiting the required scope and effort of project-specific National Environmental Policy Act of 1969 (NEPA) analyses.

The BLM is committed to collecting additional SEZ-specific resource data and conducting additional analysis in order to more efficiently facilitate future development in SEZs. The BLM developed action plans for each of the 17 SEZs carried forward as part of the Supplement to the Draft Solar PEIS (BLM and DOE 2011). These action plans described additional data that could be collected for individual SEZs and proposed data sources and methods for the collection of those data. Work is underway to collect additional data as specified under these action plans (e.g., additional data collection to support evaluation of cultural, visual, and water resources has begun). As the data become available, they will be posted to the project Web site (http://solareis.anl.gov) for use by applicants and the BLM and other agency staff.

To accommodate the flexibility described in the BLM's program objectives and in light of anticipated changes in technologies and environmental conditions over time, the BLM has removed some of the prescriptive SEZ-specific design features presented in the Draft Solar PEIS (BLM and DOE 2010) and the Supplement to the Draft Solar PEIS (e.g., height restrictions on technologies used to address visual resource impacts). Alternatively, the BLM will give full consideration to any outstanding conflicts in SEZs as part of the competitive process being developed through rulemaking (see Section 2.2.2.2.1).

In preparing selected parcels for competitive offer, the BLM will review all existing analysis for an SEZ and consider any new or changed circumstances that may affect the development of the SEZ. The BLM will also work with appropriate federal, state, and local agencies, and affected tribes, as necessary, to discuss SEZ-related issues. This work would ultimately inform how a parcel would be offered competitively (e.g., parcel size and configuration, technology limitations, mitigation requirements, and parcel-specific competitive process). Prior to issuing a notice of competitive offer, the BLM would complete appropriate NEPA analysis to support the offer. This analysis would tier to the analysis for SEZs in the Solar PEIS to the extent practicable.

It is the BLM's goal to compile all data, information, and analyses for SEZs from the Draft Solar PEIS, the Supplement to the Draft, and this Final Solar PEIS into a single location accessible via the project Web site (http://solareis.anl.gov) for ease of use by applicants and the BLM and other agency staff.

This chapter is an update to the information on California SEZs presented in the Draft Solar PEIS. As stated previously, the Iron Mountain and Pisgah SEZs were dropped from further consideration through the Supplement to the Draft Solar PEIS. For the remaining two California SEZs, Imperial East and Riverside East, the information presented in this chapter supplements and updates, but does not replace, the information provided in the corresponding Chapter 9 on proposed SEZs in California in the Draft Solar PEIS. Corrections to incorrect information in Sections 9.1 and 9.4 of the Draft Solar PEIS and in Sections C.2.1 and C.2.2 in Appendix C of the Supplement to the Draft are provided in Sections 9.1.26 and 9.4.26 of this Final Solar PEIS.

9.4 RIVERSIDE EAST

9.4.1 Background and Summary of Impacts

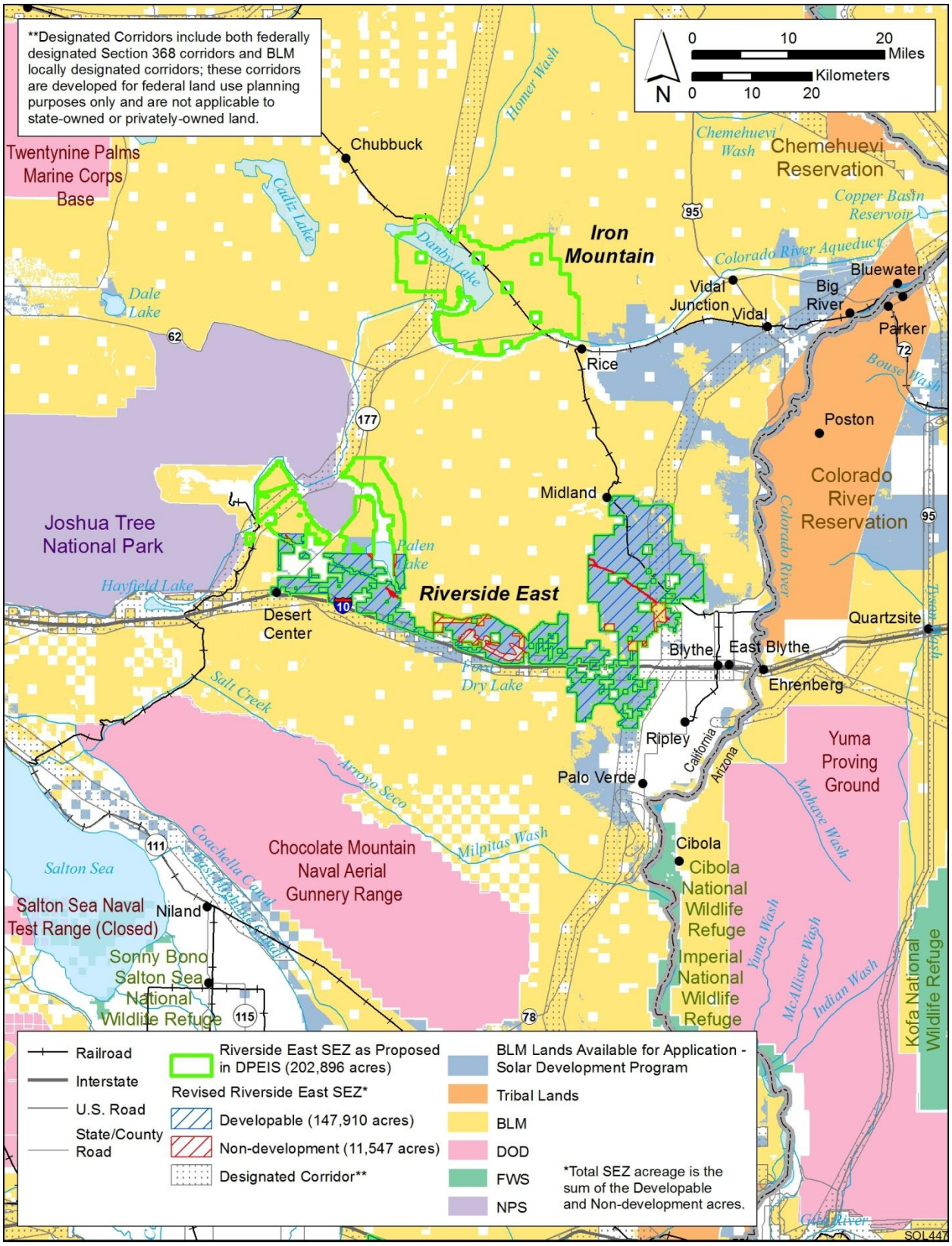
9.4.1.1 General Information

The proposed Riverside East SEZ is located in Riverside County in southeastern California. In 2008, the county population was 84,443. The small town of Desert Center is located at the far southwestern edge of the SEZ, along I-10, which runs east–west along the southern boundary of the SEZ. Other paved roads that cross parts of the Riverside East SEZ include State Route 177, which runs north–south through the western section of the SEZ, and Midland Road, which crosses the northeastern portion of the SEZ. U.S. 95 runs north–south about 3 mi (5 km) from the eastern boundary of the SEZ and through the City of Blythe, which is located about 6 mi (10 km) southeast of the SEZ. The nearest operating railroad is the ARZC Railroad, which passes through Rice, about 18 mi (29 km) north of the large eastern section of the proposed Riverside East SEZ.

As of October 28, 2011, two solar projects totaling 1,250 MW and about 9,000 acres had been approved within the proposed Riverside East SEZ, and seven additional solar project applications were pending in the SEZ. The combined areas of these approved projects and pending applications covers about 57,000 acres (534 km^2)of the proposed SEZ; the combined projected capacity is 4,000 MW. There is an additional approved 550-MW PV project on BLM-administered lands under construction adjacent to the western boundary of the SEZ.

As published in the Draft Solar PEIS (BLM and DOE 2010), the proposed Riverside East SEZ had a total area of 202,896 acres (821 km^2). In the Supplement to the Draft Solar PEIS (BLM and DOE 2011), the size of the SEZ was reduced, eliminating 43,439 acres (176 km^2) in the northwest portion of the SEZ (see Figure 9.4.1.1-1). Eliminating this area is primarily intended to reduce impacts on Joshua Tree NP. In addition, 11,547 acres (47 km^2) within the SEZ boundaries have been identified as non-development areas (see Figure 9.4.1.1-2). These areas consist of intermittent lakes, major washes, and areas identified for non-development through investigations for approved projects. The remaining developable area within the SEZ is 147,910 acres (599 km^2).

Because of the extensive potential impacts from solar development in the portion of the Riverside East SEZ that has been eliminated, those lands are proposed as solar ROW exclusion areas; that is, applications for solar development on these lands will not be accepted by the BLM. In addition, lands within the SEZ identified during investigations for approved projects as areas where solar energy development should not occur will be defined as non-development areas. All proposed projects within the Riverside East SEZ will continue to be reviewed by California's Renewable Energy Action Team to ensure consistency with the ongoing efforts of the DRECP (see Section 1.6.2.3).



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2 **FIGURE 9.4.1.1-1 Proposed Riverside East SEZ as Revised**

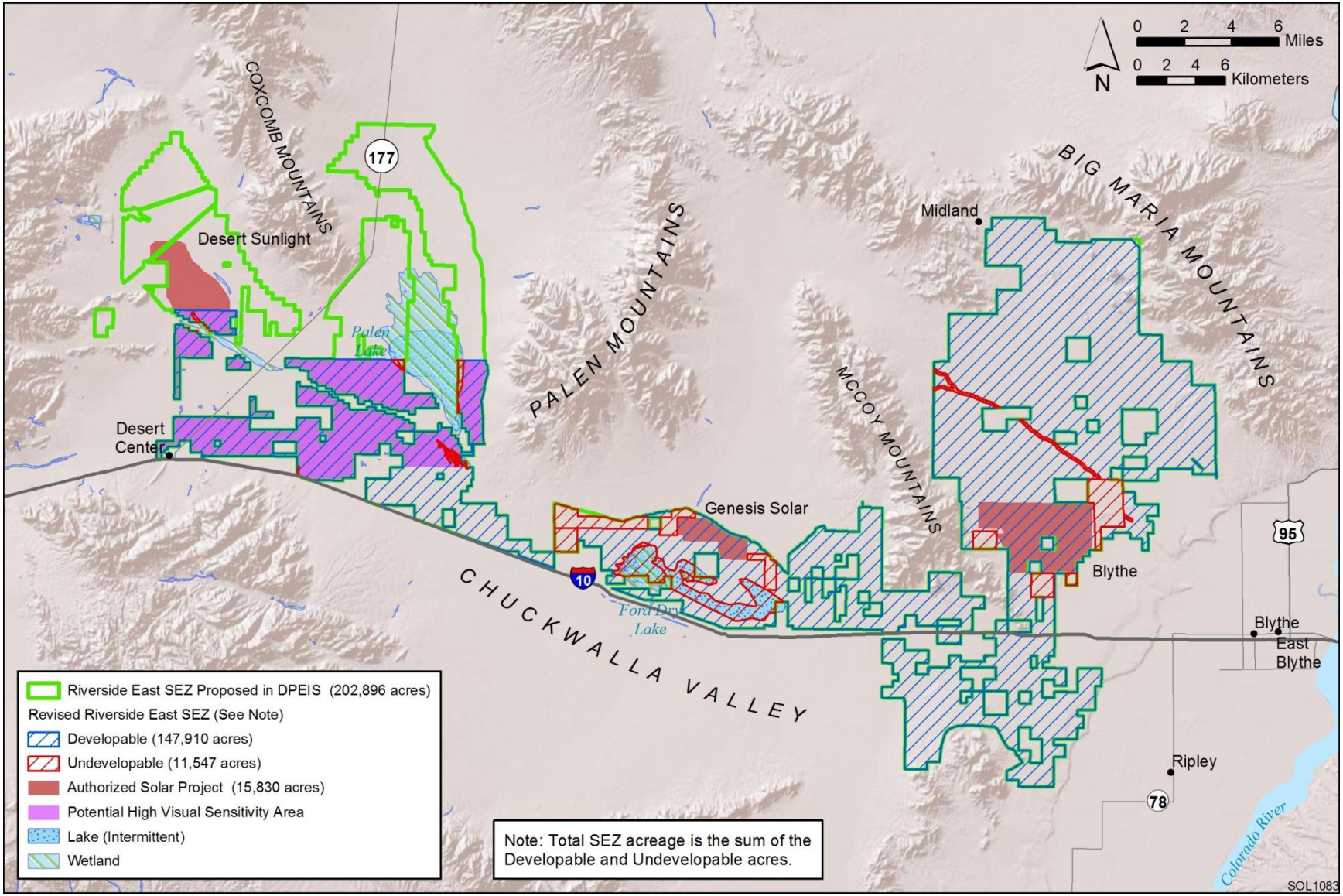

FIGURE 9.4.1.1-2 Developable and Non-development Areas for the Proposed Riverside East SEZ as Revised

The analyses in the following sections update the affected environment and potential environmental, cultural, and socioeconomic impacts associated with utility-scale solar energy development in the Riverside East SEZ as described in the Draft Solar PEIS.

9.4.1.2 Development Assumptions for the Impact Analysis

Maximum solar development of the proposed Riverside East SEZ is assumed to be 80% of the developable SEZ area over a period of 20 years, a maximum of 118,328 acres (479 km^2) (the actual area developed may be less). Full development of the Riverside East SEZ would allow development of facilities with an estimated total of between 13,148 MW (power tower, dish engine, or PV technologies, 9 acres/MW [0.04 km^2/MW]) and 23,666 MW (solar trough technologies, 5 acres/MW [0.02 km^2/MW]) of electrical power capacity.

Availability of transmission from SEZs to load centers will be an important consideration for future development in SEZs. For the proposed Riverside East SEZ, the nearest existing transmission line as identified in the Draft Solar PEIS is a 500-kV transmission line that runs through the SEZ. In addition, a 69-kV line passes through the eastern portion of the SEZ. It is possible that these existing lines could be used to provide access from the SEZ to the transmission grid, but the capacity of these lines would not be adequate for 13,148 to 23,666 MW of new capacity. Therefore, at full build-out capacity, new transmission lines and upgrades of existing transmission lines would be required to bring electricity from the proposed Riverside East SEZ to load centers. An assessment of the most likely load center destinations for power generated at the Riverside East SEZ and a general assessment of the impacts of constructing and operating all new transmission facilities for those load centers are provided in Section 9.4.23. In addition, the generic impacts of transmission lines and associated infrastructure construction and of line upgrades for various resources are discussed in Chapter 5 of this Final Solar PEIS. Project-specific analyses would also be required to identify the specific impacts of any new transmission construction and/or line upgrades for any projects proposed within the SEZ.

The Riverside East SEZ overlaps a Section 368 federally designated energy corridor along I-10.[1] In addition, there is one north–south locally designated transmission corridor located in the western portion of the SEZ. For this impact assessment, it is assumed that up to 80% of the proposed SEZ could be developed. This does not take into account the potential limitations to solar development that may result from siting constraints associated with these corridors. The development of solar facilities and existing corridors will be dealt with by the BLM on a case-by-case basis; see Section 9.4.2.2 on impacts on lands and realty for further discussion.

For the proposed Riverside East SEZ, I-10 passes along the southern edge of the SEZ, and there are several exits from I-10 as it passes by and through the SEZ. Existing road access to

[1] Section 368 of the Energy Policy Act of 2005 (P.L. 109-58) required federal agencies to engage in transmission corridor planning (see Section 1.6.2.1 of the Draft Solar PEIS). As a result of this mandate, the BLM, DOE, USFS, and DoD prepared a PEIS to evaluate the designation of energy corridors on federal lands in 11 western states, including the 6 states evaluated in this study (DOE and DOI 2008). The BLM and USFS issued RODs to amend their respective land use plans to designate numerous corridors, often referred to as Section 368 corridors.

the proposed Riverside East SEZ should be adequate to support construction and operation of solar facilities. No additional road construction outside of the SEZ is assumed to be required to support solar development, as summarized in Table 9.4.1.2-1.

9.4.1.3 Programmatic and SEZ-Specific Design Features

The proposed programmatic design features for each resource area to be required under the BLM Solar Energy Program are presented in Section A.2.2 of Appendix A of this Final Solar PEIS. These programmatic design features are intended to avoid, minimize, and/or mitigate adverse impacts from solar energy development and will be required for development on all BLM-administered lands including SEZ and non-SEZ lands.

The discussions below addressing potential impacts of solar energy development on specific resource areas (Sections 9.4.2 through 9.4.22) also provide an assessment of the effectiveness of the programmatic design features in mitigating adverse impacts from solar development within the SEZ. SEZ-specific design features to address impacts specific to the proposed Riverside East SEZ may be required in addition to the programmatic design features. The proposed SEZ-specific design features for the Riverside East SEZ have been updated on the basis of revisions to the SEZ since the Draft Solar PEIS (such as boundary changes and the identification of non-development areas) and on the basis of comments received on the Draft

TABLE 9.4.1.2-1 Assumed Development Acreages, Solar MW Output, and Locations of Nearest Major Road and Transmission Line for the Proposed Riverside East SEZ as Revised

Total Developable Acreage and Assumed Developed Acreage (80% of Total)	Assumed Maximum SEZ Output for Various Solar Technologies	Distance to Nearest State, U.S. or Interstate Highway	Distance and Capacity of Nearest Existing Transmission Line	Assumed Area of Road ROW	Distance to Nearest Designated Transmission Corridor[d]
147,910 acres[a] and 118,328 acres	13,148MW[b] 23,666 MW[c]	Adjacent (I-10)	Through the SEZ, 500 kV	0 acres	Through the SEZ[e]

[a] To convert acres to km^2, multiply by 0.004047.

[b] Maximum power output if the SEZ were fully developed using power tower, dish engine, or PV technologies, assuming 9 acres/MW (0.04 km^2/MW) of land required.

[c] Maximum power output if the SEZ were fully developed using solar trough technologies, assuming 5 acres/MW (0.02 km^2/MW) of land required.

[d] BLM-designated corridors are developed for federal land use planning purposes only and are not applicable to state-owned or privately owned land.

[e] A Section 368 federally designated 2-mi (3-km) wide energy corridor runs adjacent to the south boundary of the SEZ.

Solar PEIS and Supplement to the Draft. All applicable SEZ-specific design features identified to date (including those from the Draft Solar PEIS that are still applicable) are presented in Sections 9.4.2 through 9.4.22.

9.4.2 Lands and Realty

9.4.2.1 Affected Environment

The boundaries of the proposed Riverside East SEZ have been revised, reducing the total acreage of the area from 202,896 acres (821 km^2) to 159,457 (645 km^2). Most of the acreage that was eliminated was located in the western portion of the SEZ near Joshua Tree NP. Within the remaining SEZ, an additional 11,547 acres (46.7 km^2) have been identified as non-development areas for various reasons, including the presence of intermittent lakes and major drainages; areas also have been identified for non-development through investigations of specific applications for solar energy development. Since the Draft Solar PEIS was published, two utility-scale solar energy projects have been approved within the SEZ in the central and eastern portions of the proposed SEZ (Genesis Solar and Blythe Solar, respectively). The Desert Sunlight PV project (previously inside the boundaries of the proposed SEZ but now adjacent to the western boundary of the SEZ) has also been approved. There are an additional seven pending projects within the area of the proposed SEZ. With the revision of the SEZ boundaries, the SEZ is no longer adjacent to the Colorado River Aqueduct. Two designated energy corridors still pass through the SEZ. The remaining description of the affected environment in the Draft Solar PEIS remains valid.

9.4.2.2 Impacts

Full development of the SEZ is anticipated to disturb about 118,328 acres (479 km^2), create a very large and continuous industrial-type area along a 45-mi (72-km) stretch of I-10, and exclude many existing and potential uses of the public land. Solar development along I-10, CA 177, and Midland Road would fundamentally change the viewscape of these areas for the traveling public. Because of the interspersed nature of private and public lands in the western portion of the proposed SEZ, solar development will likely raise concerns for some private landowners. There are approximately 11,640 acres (47 km^2) of private and state lands located within the external boundaries of or in near proximity to the SEZ that could be used for solar development in a manner similar to public lands if the landowners agree. Roads and trails that cross solar development areas could be closed to public use. Based on the analysis of applications for solar energy development both approved and filed to date, there is a high likelihood of isolating public lands in and around solar energy facilities such that these lands would not be readily accessible and may be hard to manage.

The Riverside East SEZ partially overlaps one Section 368 federally designated energy corridor and one locally designated transmission corridor. These existing corridors will be used primarily for the siting of transmission lines and other infrastructure such as pipelines. These

existing corridors will be the preferred locations for any transmission development that is required to support solar development and future transmission grid improvements related to the build-out of the Riverside East SEZ. Any use of the corridor lands within the Riverside SEZ for solar energy facilities, such as solar panels or heliostats, must be compatible with the future use of the existing corridors. The BLM will assess solar projects in the vicinity of existing corridors on a case-by-case basis, and it will review and approve individual project plans of development to ensure compatible development that maintains the use of the corridor.

9.4.2.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on lands and realty are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide some mitigation for the identified impacts but will not mitigate all adverse impacts. For example, impacts related to the exclusion of many existing and potential uses of the public land, the visual impact of an industrial-type solar facility within an otherwise rural area, and induced land use changes, if any, on nearby or adjacent state and private lands will not be fully mitigated.

No SEZ-specific design features for lands and realty have been identified through this Final Solar PEIS. Some SEZ-specific design features may be established for parcels within the Riverside East SEZ through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

9.4.3 Specially Designated Areas and Lands with Wilderness Characteristics

9.4.3.1 Affected Environment

The proposed Riverside SEZ is near or adjacent to Joshua Tree NP, seven designated WAs (including wilderness within Joshua Tree NP), and eight ACECs. The revised northwestern boundary of the proposed SEZ between the Coxcomb and Palen Mountains removes the area within the SEZ where solar development could be located very near to the National Park boundary and to the western boundary of the BLM-administered Palen-McCoy WA. The movement of the boundary in the very northwest corner of the SEZ between the Coxcomb and Eagle Mountains also moves the SEZ boundary farther from the National Park, but the approved Desert Sunlight project is located within the area that is no longer part of the SEZ. The remainder of the area removed from the proposed SEZ in the Draft Solar PEIS is now identified as an exclusion area for development of solar energy facilities.

A change from the Supplement to the Draft Solar PEIS is that the proposed technology restrictions have been removed in favor of identifying the visually sensitive areas that would be evaluated when solar energy development is considered through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

A recent inventory of wilderness characteristics has identified an area of about 20,000 acres (81 km^2) that possesses wilderness characteristics located on the valley floor adjacent to the foot of the eastern side of the McCoy Mountains. This area contains numerous channels that are tributary to McCoy Wash and is part of the area identified as desert tortoise connectivity habitat. Portions of the area likely would be classified as microphyll woodland because of the density of ironwood present. Approximately 11,925 acres (48.3 km^2) of this area is located within the boundary of the proposed SEZ (Figure 9.4.3.1-1).

9.4.3.2 Impacts

Moving the northwestern boundary of the proposed SEZ originally located between the Coxcomb and Palen Mountains to the south substantially reduces potential visual impacts on this part of Joshua Tree NP and designated wilderness within the park and on BLM-administered wilderness resources in the western side of the Palen-McCoy WA. Moving the boundary of the very northwestern portion of the proposed SEZ located between the Coxcomb and Eagle Mountains to the south prevents additional solar development on BLM-administered public lands in this area near the National Park. Designation of the lands removed from the proposed SEZ in the Draft Solar PEIS as solar exclusion areas will prevent future solar development of these areas. The BLM-authorized Desert Sunlight project in this area is now outside of the proposed SEZ boundary, but the impacts of this project will remain. Solar energy development within the revised SEZ boundary would still be very visible to portions of the National Park and designated wilderness and to surrounding BLM wilderness areas, and would still adversely affect these resources. Visual impacts of solar energy development within the western portion of the revised SEZ will be dependent upon the technologies employed and the mitigation measures required.

Except for the reduction of the potential impact on wilderness resources on the eastern side of the National Park and on the western border of the Palen-McCoy WA, the impacts on wilderness resources in the Palen-McCoy (on the southwestern and southern boundaries), Rice Valley, Big Maria Mountains, and Chuckwalla and Little Chuckwalla Mountains WAs and in the seven ACECs that are described in the Draft Solar PEIS remain valid.

The BLM is proposing that the 11,925 acres (48.3 km^2) of lands possessing wilderness characteristics within the SEZ east of the McCoy Mountains not be managed to protect those wilderness characteristics. The BLM has determined that the Riverside East SEZ has generally low resource conflict and high potential for solar energy development including access to transmission. The BLM has identified utility-scale solar energy development on public lands as a potentially important component in meeting the nation's energy goals and objectives in applicable orders and mandates (see Sections 1 and 1.1 of this Final Solar PEIS). The build out of the Riverside East SEZ for utility-scale solar energy development and the associated infrastructure would likely create impacts that would limit the BLM's effectiveness in managing

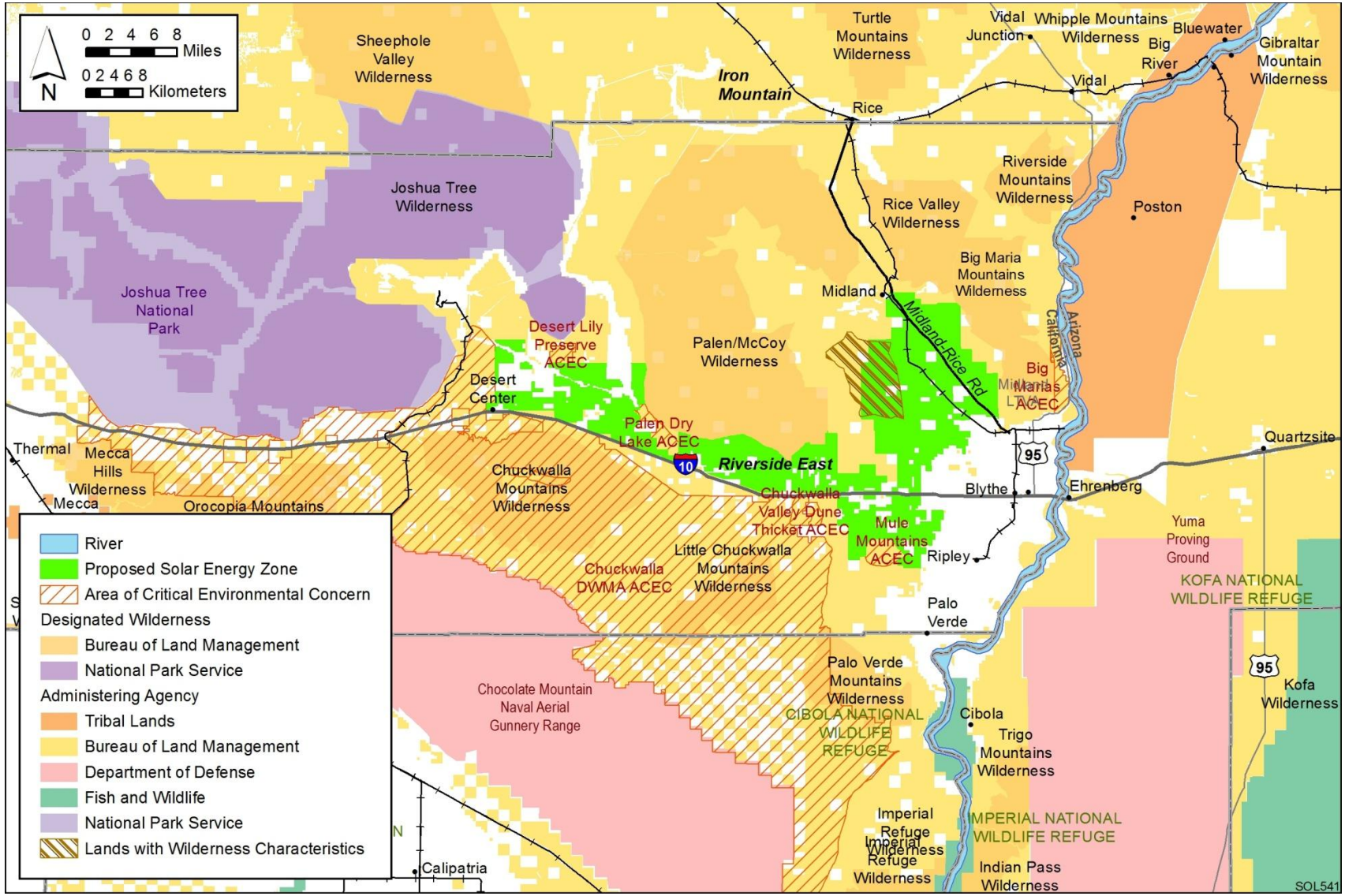

FIGURE 9.4.3.1-1 Specially Designated Areas and Lands with Wilderness Characteristics in the Vicinity of the Proposed Riverside East SEZ as Revised

to protect the subject lands with wilderness characteristics. Solar development on or near to these lands would eliminate the wilderness characteristics that currently exist. Solar energy development within the SEZ would also likely eliminate or adversely affect the wilderness characteristics on the remaining approximately 8,000 acres (32.3 km^2) of land possessing wilderness characteristics that are adjacent to the proposed SEZ boundary.

9.4.3.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on specially designated areas are described in Section A.2.2 of Appendix A of this Final Solar PEIS (design features for both specially designated areas and visual resources would address impacts). Implementing the programmatic design features will provide some mitigation for the identified impacts but will not mitigate all adverse impacts on the National Park and on wilderness characteristics in both the National Park and BLM-administered wilderness.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, the following SEZ-specific design feature has been identified:

- Once construction of solar energy facilities begins, the BLM would monitor whether there are increases in human traffic to the seven ACECs in and near the SEZ and determine whether additional design features are required to protect the resources in these areas.

The need for additional SEZ-specific design features will be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

9.4.4 Rangeland Resources

9.4.4.1 Livestock Grazing

9.4.4.1.1 Affected Environment

As presented in the Draft Solar PEIS, there are no active grazing allotments in the proposed Riverside East SEZ. The revised area of the SEZ does not alter this finding.

9.4.4.1.2 Impacts

Because the SEZ does not contain any active grazing allotments, solar energy development within the SEZ would have no impact on livestock and grazing.

9.4.4.1.3 SEZ-Specific Design Features and Design Feature Effectiveness

Because the SEZ does not contain any active grazing allotments, no SEZ-specific design features to protect livestock grazing have been identified in this Final Solar PEIS.

9.4.4.2 Wild Horses and Burros

9.4.4.2.1 Affected Environment

As presented in the Draft Solar PEIS, no wild horse or burro HMAs occur within the proposed Riverside East SEZ or in close proximity to it. The revised area of the SEZ does not alter this finding.

9.4.4.2.2 Impacts

As presented in the Draft Solar PEIS, solar energy development within the proposed Riverside East SEZ would not affect wild horses and burros. Development within the revised area of the Riverside East SEZ does not affect this conclusion.

9.4.4.2.3 SEZ-Specific Design Features and Design Feature Effectiveness

Because solar energy development within the proposed Riverside East SEZ would not affect wild horses and burros, no SEZ-specific design features to address wild horses and burros have been identified in this Final Solar PEIS.

9.4.5 Recreation

9.4.5.1 Affected Environment

With the exception of the Midland long-term visitor area (LTVA) in the eastern portion of the SEZ (described in the Draft Solar PEIS), the lands within the proposed Riverside East SEZ are not believed to support a large amount of recreational use. Although there are a wide variety of recreational opportunities within the SEZ, there are no recreational use statistics documenting use of the area. The fact that this public land is currently available for easy public access and use, has an existing network of roads and trails, and is near both large and small population centers gives it significant potential value for recreational use. The description in the Draft Solar PEIS remains valid.

9.4.5.2 Impacts

Recreation users would be displaced from areas developed for solar energy production. Currently open vehicle routes within the proposed SEZ could be closed or rerouted. It currently is unknown whether solar energy development would have an adverse impact on the use of the Midland LTVA.

Recreational users would be displaced from areas developed for solar energy production within the Riverside East SEZ. Vehicle routes currently open within the proposed SEZ could be closed or rerouted. In addition, lands that are outside of the proposed SEZ may be acquired or managed for mitigation of impacts on other resources (e.g., sensitive species). Managing these lands for mitigation could further exclude or restrict recreational use, potentially.leading to additional losses in recreational opportunities in the region. The impact of acquisition and management of mitigation lands would be considered as a part of the environmental analysis of specific solar energy projects.

It currently is unknown whether solar energy development would have an adverse impact on the use of the Midland LTVA. The determination of impacts will be conducted as part of the process of preparing parcels for competitive offer and subsequent project-specific analysis.

9.4.5.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on recreational resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide adequate mitigation for most identified impacts with the possible exception of impacts on the Midland LTVA.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, the following SEZ-specific design feature has been identified:

- A buffer area should be established between the LTVA and solar development to preserve the setting of the LTVA. The size of the buffer area should be determined based on site and visitor-specific criteria.

The need for additional SEZ-specific design features will be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

9.4.6 Military and Civilian Aviation

9.4.6.1 Affected Environment

The description in the Draft Solar PEIS remains valid. The proposed Riverside East is located under numerous MTRs and between two SUAs. There are two civilian airports, Blythe and Desert Center, in close proximity to the SEZ. A large portion of the proposed SEZ is covered by eight MTRs.

9.4.6.2 Impacts

The development of any solar energy or transmission facilities that encroach into military airspace could interfere with military training activities and could be a safety concern. Concerns have been raised that thermal plumes from condensers associated with solar facilities and reflected glare from solar collectors or mirrors could be hazardous for pilots approaching or departing the local airports. The description in the Draft Solar PEIS remains valid.

9.4.6.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on military and civilian aviation are described in Section A.2.2 of Appendix A of this Final Solar PEIS. The programmatic design features require early coordination with the DoD to identify and avoid, minimize, and/or mitigate, if possible, potential impacts on the use of military airspace.

No SEZ-specific design features for military and civilian aviation have been identified in this Final Solar PEIS. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

9.4.7 Geologic Setting and Soil Resources

9.4.7.1 Affected Environment

9.4.7.1.1 Geologic Setting

Data provided in the Draft Solar PEIS remain valid, with the following updates:

- The proposed Riverside East SEZ spans the length of the Chuckwalla Valley; its western end covers portions of the northern Chuckwalla, and its eastern end covers the Palo Verde Mesa (Figure 9.4.7.1-1). The boundaries of the proposed SEZ have been changed to eliminate 43,439 acres (176 km^2) in the

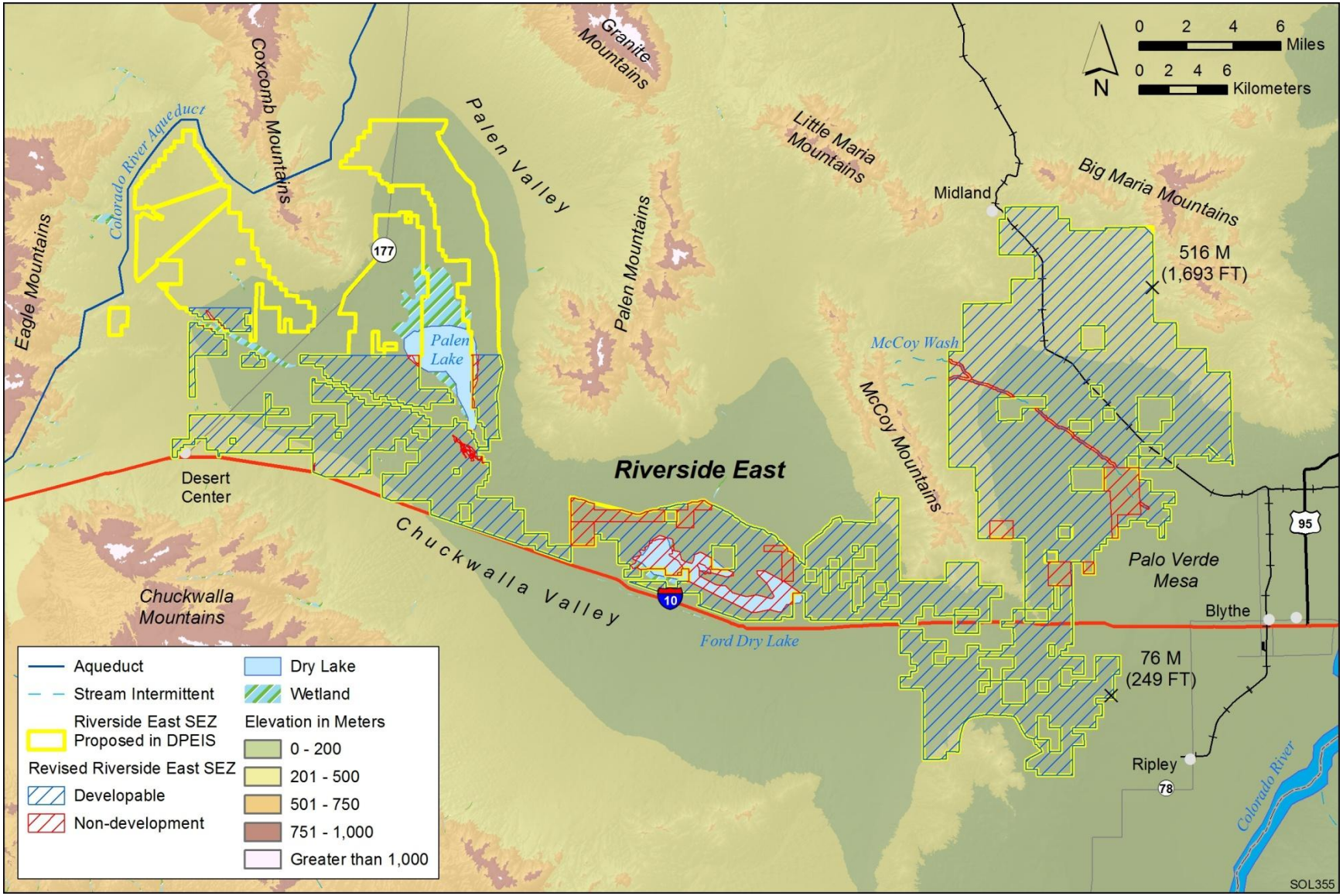

FIGURE 9.4.7.1-1 General Terrain of the Proposed Riverside East SEZ as Revised

northwest portion of the site. Within this revised area, another 11,547 acres (46.7 km^2) of intermittent lakes and major washes were identified as non-development areas. On the basis of these changes, the western part of the SEZ in the Chuckwalla Valley slopes to the northeast, with elevations ranging from about 820 ft (250 m) near Desert Center to less than 490 ft (150 m) in the sand dunes region along the southwestern edge of Palen Lake. The topography of the site along the central part of the Chuckwalla Valley and on Palo Verde Mesa are the same as previously described.

- The McCoy Wash is an ephemeral stream; it is not a perennial stream as stated in the Draft Solar PEIS.

- The levees referred to here do not channel runoff to the Colorado River Aqueduct; rather, these features are V-dikes that provide flood protection for the Colorado River Aqueduct. The V-dikes channel water away from the open canal segments of the Colorado River Aqueduct to the larger washes that the Colorado River Aqueduct crosses underneath by means of inverted siphons. No floodwater or other surface runoff is ever channeled to the Colorado River Aqueduct.

- The levees channel runoff into culverts and underpass channels passing beneath I-10, concentrating flows that are more diffuse to the north (upslope) of I-10.

9.4.7.1.2 Soil Resources

Data provided in the Draft Solar PEIS remain valid, with the following updates:

- Soils within the proposed Riverside East SEZ as revised are predominantly gravelly loams typical of alluvial fan terraces, which together make up about 67% of the site's soil coverage (Table 9.4.7.1-1). Dune land soils cover about 20% of the SEZ.

- Soil unit coverage at the proposed Riverside East SEZ as revised is shown in Figure 9.4.7.1-2. Taken together, the new SEZ boundaries and non-development areas eliminate 20,114 acres (81 km^2) of the Vaiva–Quilotosa–Hyder–Cipriano–Cherioni series, 6,270 acres (25 km^2) of the Rillito–Gunsight series, 19,253 acres (78 km^2) of the Rositas–Dune land–Carsitas series, 1,430 acres (5.7 km^2) of the Rositas–Orita–Carrizo–Aco series, 5,774 acres (23 km^2) (all) of the Rositas–Carrizo series, 2,055 acres (8.3 km^2) of Playas, 125 acres (0.51 km^2) of Tecopa–Rock outcrop–Lithic Torriorthents series, and 2 acres (0.0081 km^2) (all) of the St. Thomas–Rock outcrop series.

TABLE 9.4.7.1-1 Summary of Soil Series within the Proposed Riverside East SEZ as Revised

Map Unit Symbol	Map Unit Name	Erosion Potential		Description	Area[a] in Acres[b] (percentage of SEZ)
		Water[a]	Wind[b]		
s1141	Vaiva–Quilotosa–Hyder–Cipriano–Cherioni	–[c]	–	Vaiva series, Quilatosa, and Hyder series are soils on hills and mountains with slopes of 1 to 70%. Very shallow and shallow and well to excessively drained soils with medium to high runoff and moderate to moderately rapid permeability. Typically very gravelly loams to extremely gravelly coarse sandy loam. Used mainly for livestock grazing, wildlife habitat, and recreation. Cipriano and Cherioni series soils are formed on fan terraces and hills with slopes of 0 to 70%. Shallow and very shallow (to a hardpan) and somewhat excessively drained soils with low to very high runoff and moderate permeability. Typically very gravelly loam to very gravelly fine sandy loam. Used mainly for livestock grazing (both) and wildlife habitat (Cipriano series only).	64,057 (40.2)[d]
s1140	Rillito–Gunsight	–	–	Rillito series are nearly level to gently sloping soils on fan terraces (gradients of 0 to 3%). Deep and well-drained soils with low to medium surface-runoff potential and moderate to moderately rapid permeability. Gunsight series are gently sloping to sloping soils on fan or stream terraces (gradients of 0 to 60%). Very deep and somewhat excessively drained with very low to high surface-runoff potential and moderate to moderately rapid permeability. Aridic soil moisture regime. Typically very gravelly loam. Used mainly for livestock grazing and recreation.	44,268 (27.8)[e]

TABLE 9.4.7.1-1 (Cont.)

Map Unit Symbol	Map Unit Name	Erosion Potential		Description	Area[a] in Acres[b] (percentage of SEZ)
		Water	Wind		
s1136	Rositas–Dune land–Carsitas	–	–	Rositas series are gently sloping soils on dunes and sand sheets (gradients of 0 to 30%). Very deep and somewhat excessively drained with low surface-runoff potential (high infiltration rate) and rapid permeability. Typically fine sand. Dune land soils are constantly shifting medium-grained sand deposited by wind blowing across the valley. Parent material consists of eolian sands. Little or no vegetation; very rapid permeability. Carsitas series are nearly level to strongly sloping soils on alluvial fans, moderately steep valley fills, and dissected alluvial fan remnants. Excessively drained with slow surface runoff (except during torrential events) and rapid permeability. Typically gravelly sand. Used for watershed and recreation; commercial source of sand and gravel.	32,120 (20.1)[f]
s1041	Rositas–Orita–Carrizo–Aco	–	–	Rositas series described above. Orita series are nearly level to gently sloping soils on fan remnants and terraces (gradients of 0 to 2%). Parent material consists of alluvium from mixed sources. Very deep and well-drained soils with very low to medium surface-runoff potential and moderate permeability. Well suited for cultivation if irrigated but not as rangeland. Carrizo series are gently sloping soils on floodplains, alluvial fans, fan piedmonts, and bolson floors (gradients of 0 to 15%). Parent material consists of alluvium from mixed sources. Very deep and excessively drained soils with negligible to very low surface-runoff potential and rapid to very rapid permeability. Typically extremely gravelly sand. Aridic soil moisture regime.	14,561 (9.1)[g]
s1138	Playas	–	–	Very poorly drained soils formed in flats and closed basins; moderately to strongly saline. Medium surface runoff potential and low permeability.	2,378 (1.5)[h]

TABLE 9.4.7.1-1 (Cont.)

Map Unit Symbol	Map Unit Name	Erosion Potential: Water	Erosion Potential: Wind	Description	Area[a] in Acres[b] (percentage of SEZ)
s1126	Tecopa–Rock outcrop Lithic torriorthents	–	–	Tecopa series are sloping soils on low hills and low mountain side slopes (gradients of 15 to 75%). Very shallow and well-drained soils formed in residuum and colluvium weathered from metamorphic rocks with medium to rapid surface runoff and moderate permeability. Typically very gravelly sandy loam. Used mainly as desert rangeland. Rock outcrop occurs as low ridges or boulder piles and consists of variable rock types. Rapid surface runoff and barren of vegetation. Lithic Torriorthents are sloping soils on steep hill and mountain side slopes (gradients 15 to 60% or more) with rapid surface runoff. Typically very gravelly sand loam or loam.	2,043 (1.3)

[a] Soil series not included here: Vaiva–Rock outcrop–Lithic Torriorthents (21 acres [0.085 km^2]) and Rositas–Ripley–Indio-Gilman (9 acres [0.036 km^2]).

[b] To convert acres to km^2, multiply by 0.004047.

[c] A dash indicates water and wind erosion potential not rated at the Soil Series taxonomic level.

[d] A total of 3,820 acres within the Vaiva–Quilotosa–Hyder–Cipriano–Cherioni series (s1141) is currently categorized as non-development areas (denoted by red areas in Figure 9.4.7.1-2).

[e] A total of 1,473 acres (6.0 km^2) within the Rillito–Gunsight series (s1140) is currently categorized as non-development areas (denoted by red areas in Figure 9.4.7.1-2).

[f] A total of 3,136 acres (13 km^2) within the Rositas–Dune land–Carsitas series (s1136) is currently categorized as non-development areas (denoted by red areas in Figure 9.4.7.1-2).

[g] A total of 1,427 acres (5.8 km^2) within the Rositas–Orita–Carriza–Aco series (s1041) is currently categorized as non-development areas (denoted by red areas in Figure 9.4.7.1-2).

[h] A total of 1,691 acres (6.8 km^2) within the Playas (s1138) is currently categorized as non-development areas (denoted by red areas in Figure 9.4.7.1-2).

Sources: NRCS (2006); CEC (2010a).

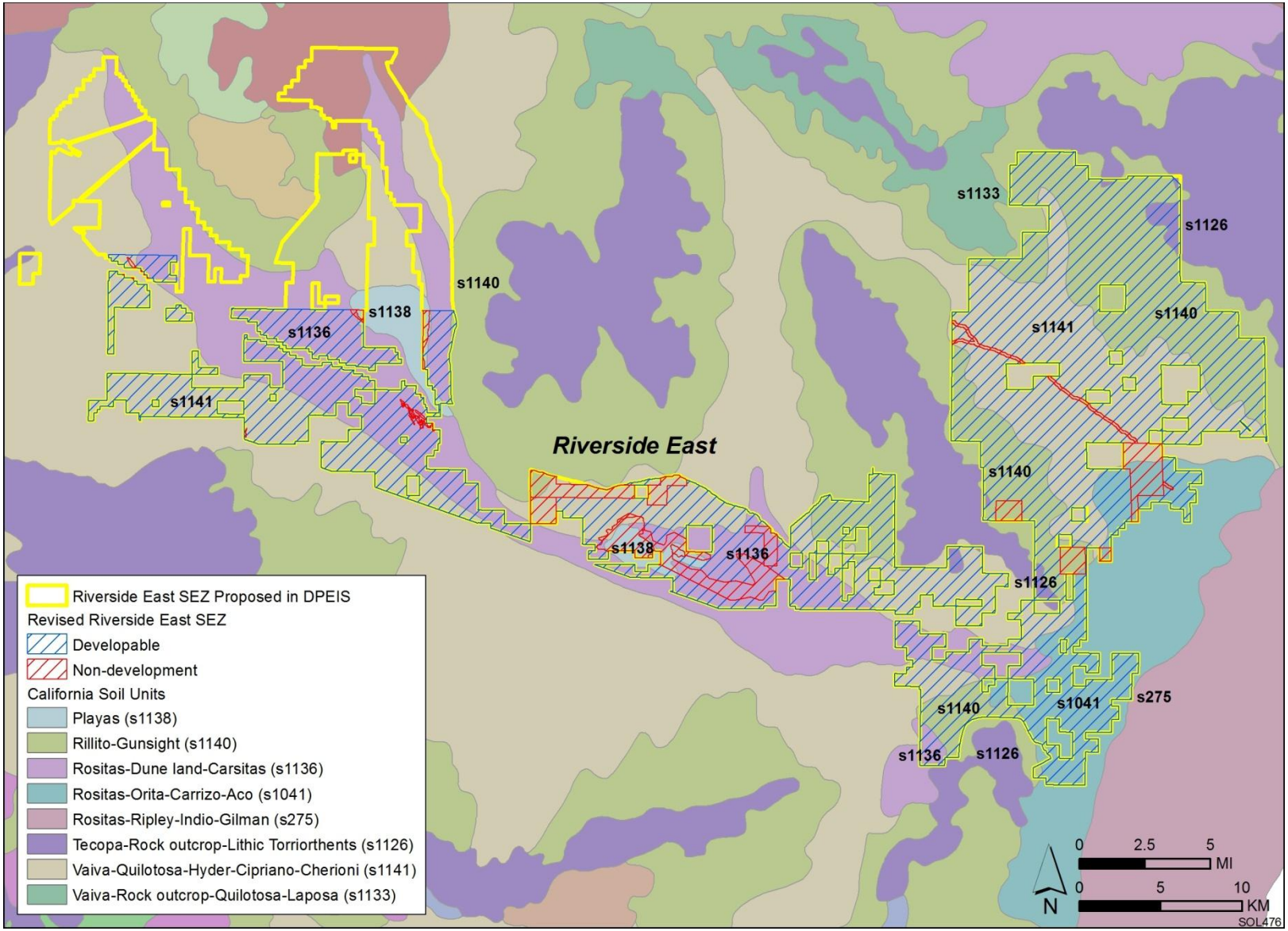

FIGURE 9.4.7.1-2 Soil Map for the Proposed Riverside East SEZ as Revised (NRCS 2008)

9.4.7.2 Impacts

Impacts on soil resources would occur mainly as a result of ground-disturbing activities (e.g., grading, excavating, and drilling), especially during the construction phase of a solar project. Because soil mapping is not complete for the California Desert area, soils have not been rated for erodibility. However, because many of the soils eliminated (or identified as non-development areas) are playas and dune land soils (about 21,300 acres [86 km^2]), the impacts related to wind erodibility are expected to be less. The assessment provided in the Draft Solar PEIS remains valid, with the following update:

- Soil disturbance of areas covered by desert pavement, especially within the western portion of the Riverside East SEZ, could result in significant soil erosion by wind, because these surfaces are underlain by fine soil particles that are highly vulnerable to erosion once exposed.

9.4.7.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on soils are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will reduce the potential for soil impacts during all project phases.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features were identified for soil resources at the proposed Riverside East SEZ. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

9.4.8 Minerals (Fluids, Solids, and Geothermal Resources)

A mineral potential assessment for the proposed Riverside East SEZ has been prepared and reviewed by BLM mineral specialists knowledgeable about the region where the SEZ is located (BLM 2012c). The BLM is proposing to withdraw the SEZ from settlement, sale, location, or entry under the general land laws, including the mining laws, for a period of 20 years (see Section 2.2.2.2.4 of the Final Solar PEIS). The potential impacts of this withdrawal are discussed in Section 9.4.24.

9.4.8.1 Affected Environment

A new review of mining claim information in the BLM LR2000 System relevant to the proposed Riverside East SEZ shows there currently is one placer claim and one mill site claim in Township 4 South, Range 21 E, SBM, in Sections 22 and 27, respectively, and one placer claim in Township 4 South, Range 22 E, SBM, in Section 33 (BLM 2010a). The remaining description in the Draft Solar PEIS is still valid.

9.4.8.2 Impacts

The description of impacts in the proposed SEZ in the Draft Solar PEIS is still accurate. If valid, the existing mining claims would be a prior existing right and would be protected. If the area is identified as an SEZ, it would continue to be closed to all incompatible forms of mineral development. Some future development of oil and gas resources beneath the SEZ would be possible, and production of common minerals could take place in areas not directly developed for solar energy production.

9.4.8.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on mineral resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide adequate protection of mineral resources.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for mineral resources have been identified in this Final Solar PEIS. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

9.4.9 Water Resources

9.4.9.1 Affected Environment

The overall size of the proposed Riverside East SEZ has been reduced by 21% from the area described in the Draft Solar PEIS. The resulting total area of 159,457 acres (645 km^2) includes 11,547 acres (46.7 km^2) designated as non-development areas, consisting of intermittent lakes and major intermittent/ephemeral streams. The description of the affected environment given in the Draft Solar PEIS relevant to water resources at the Riverside East SEZ remains valid and is summarized in the following paragraphs.

The proposed Riverside East SEZ is within the Southern Mojave–Salton Sea subbasin of the California hydrologic region. The SEZ spans the Chuckwalla Valley and Palo Verde Mesa regions of the Mojave Desert, where precipitation is between 4 and 6 in./yr (10 and 15 cm/yr), and pan evaporation rates are estimated to be on the order of 130 in./yr (330 cm/yr). No perennial surface water features are located within the Riverside East SEZ. McCoy Wash is a significant intermittent/ephemeral stream that bisects the eastern portion of the SEZ, which includes designated non-development areas. Ford Dry Lake is located near the center of the SEZ, and Palen Lake is a wet playa (shallow depth to groundwater) located in the western portion of the SEZ. Wetland areas associated with these dry lakes and playas have been designated as non-development areas as well. Several intermittent/ephemeral streams from the surrounding

mountains flow through the area, in which the general drainage pattern is from northwest to southeast.

The proposed SEZ is located in the Chuckwalla Valley and Palo Verde Mesa groundwater basins where the principal aquifer consists of alluvium and fanglomerate deposits that are on the order of 1,200 ft (366 m) thick. Groundwater typically flows eastward toward the Colorado River. Recent studies associated with fast-track solar energy developments have provided additional information pertaining to groundwater balances (summary of groundwater inflow and outflow rates) in the vicinity of the Riverside East SEZ. The Palo Verde Mesa groundwater basin receives groundwater underflow from the surrounding Chuckwalla, Palo Verde, and Colorado River basins equaling 400, 1,244, and 1,200 ac-ft/yr (493,400, 1.5 million, and 1.5 million m^3/yr), respectively, with an additional inflow from mountain front recharge estimated to be 3,086 ac-ft/yr (3.8 million m^3/yr) and irrigation return flows estimated to be 770 ac-ft/yr (950,000 m^3/yr); groundwater water withdrawals were estimated to equal the total groundwater inputs equal to 6,700 ac-ft/yr (8.3 million m^3/yr) (BLM 2010b). In the Chuckwalla Valley, groundwater recharge from precipitation is estimated to be 8,588 ac-ft/yr (10.6 million m^3/yr), groundwater underflow from the Pinto Valley and Orocopia Valley combine to be 3,500 ac-ft/yr (4.3 million m^3/yr), irrigation and wastewater pond return flows are estimated to be 1,631 ac-ft/yr (2 million m^3/yr); groundwater withdrawals are estimated at 10,361 ac-ft/yr (12.8 million m^3/yr), groundwater underflow to the Palo Verde Mesa basin is 400 ac-ft/yr (493,400 m^3/yr), and evapotranspiration from Palen Lake is estimated to be 350 ac-ft/yr (431,700 m^3/yr) (BLM 2010e, 2011m). Groundwater surface elevations have remained steady for several decades; however, it is suspected that further groundwater development in the area may lead to a decline in groundwater elevation. The best water quality in terms of TDS is in the western portion of the Chuckwalla Valley, because TDS concentrations increase as the groundwater flows eastward. High concentrations of arsenic, selenium, fluoride, chloride, boron, sulfate, and TDS occasionally restrict the use of groundwater for domestic and agricultural applications.

California uses a "plura" system to manage water resources, where riparian and prior appropriation doctrines are used for surface waters, and groundwater management is conducted primarily through local governments, local agencies, or ordinances. Groundwater for most of the proposed SEZ is subject to State of California laws, because there are no local management entities in the area. The primary water management consideration relevant to the Riverside East SEZ is the assemblage of compacts, federal laws, court decrees, and contracts that form the "Law of the River," which pertains to the management of the Colorado River. In accordance with the Law of the River, the USGS developed a method for identifying groundwater wells outside of the Colorado River's floodplain, where groundwater is replenished by Colorado River water. This method is known as the Accounting Surface, and it establishes a surface of static groundwater elevations, below which water is accounted for as Colorado River water and above which water is accounted for as local tributary replenished water. The Colorado River Accounting Surface is at an elevation between 238 and 240 ft (72.5 and 73 m) for most of the Chuckwalla Valley and Palo Verde Mesa groundwater basins. Any groundwater extractions from the Riverside East SEZ would need to coordinate with the U.S. Bureau of Reclamation regarding the potential extraction of groundwater below the Colorado River Accounting Surface, which is subject to management under the Law of the River.

In addition to the water resources information provided in the Draft Solar PEIS, this section provides a planning-level inventory of available climate, surface water, and groundwater monitoring stations within the immediate vicinity of the Riverside East SEZ and surrounding basin. Additional data regarding climate, surface water, and groundwater conditions are presented in Tables 9.4.9.1-1 through 9.4.9.1-7 and in Figures 9.4.9.1-1 through 9.4.9.1-3. Fieldwork and hydrologic analyses to determine 100-year floodplains and jurisdictional water bodies would need to be coordinated with appropriate federal, state, and local agencies. Areas within the Riverside East SEZ that are found to be within a 100-year floodplain will be designated as non-development areas. Any water features within the Riverside East SEZ determined to be jurisdictional will be subject to the permitting process described in the CWA.

9.4.9.2 Impacts

9.4.9.2.1 Land Disturbance Impacts on Water Resources

The discussion of land disturbance effects on water resources in the Draft Solar PEIS remains valid. As stated in the Draft Solar PEIS, land disturbance activities could potentially affect drainage patterns, along with groundwater recharge and discharge processes. Particular areas of concern regarding land disturbance mentioned in the Draft Solar PEIS include the regions around McCoy Wash, Palen Lake, Ford Dry Lake, sand dune areas near Palen Lake, and several alluvial fan features. Identified non-development areas within the proposed Riverside East SEZ include McCoy Wash, along with portions of Palen Lake and Ford Dry Lake, which reduces the potential for adverse impacts associated with land disturbance activities.

TABLE 9.4.9.1-1 Watershed and Water Management Basin Information Relevant to the Proposed Riverside East SEZ as Revised

Basin	Name	Area (acres)[b]
Subregion (HUC4)[a]	Southern Mojave–Salton Sea (1810)	10,260,588
Subregion (HUC4)	Lower Colorado (1503)	11,008,867
Cataloging unit (HUC8)	Southern Mojave (18100100)	5,627,073
Cataloging unit (HUC8)	Imperial Reservoir (15030104)	2,194,903
Groundwater basin	Palo Verde Mesa	226,000
Groundwater basin	Chuckwalla Valley	605,000
SEZ	Riverside East	159,457

[a] HUC = Hydrologic Unit Code; a USGS system for characterizing nested watersheds that includes large-scale subregions (HUC4) and small-scale cataloging units (HUC8).

[b] To convert acres to km^2, multiply by 0.004047.

TABLE 9.4.9.1-2 Climate Station Information Relevant to the Proposed Riverside East SEZ as Revised

Climate Station (COOP ID[a])	Elevation[b] (ft)[c]	Distance to SEZ (mi)[d]	Period of Record	Mean Annual Precipitation (in.)[e]	Mean Annual Snowfall (in.)
Blythe, California (040924)	268	18	1913–2011	3.80	0.00
Eagle Mountain, California (042598)	973	33	1933–2011	3.65	0.00
Hayfield Reservoir, California (043855)	1,370	42	1933–2011	4.14	0.10
Iron Mountain, California (044297)	922	33	1935–2011	3.44	0.10

[a] National Weather Service's Cooperative Station Network station identification code.

[b] Surface elevations for the proposed Riverside East SEZ range from 450 to 1,000 ft.

[c] To convert ft to m, multiply by 0.3048.

[d] To convert mi to km, multiply by 1.6093.

[e] To convert in. to cm, multiply by 2.540.

Source: NOAA (2012).

TABLE 9.4.9.1-3 Total Lengths of Selected Streams at the Subregion, Cataloging Unit, and SEZ Scale Relevant to the Proposed Riverside East SEZ as Revised

	Subregion, HUC4		Subbasin, HUC8		
Water Feature	Southern Mojave–Salton Sea (ft)[a]	Lower Colorado (ft)	Southern Mojave (ft)	Imperial Reservoir (ft)	SEZ (ft)
Unclassified streams	0	11,539	0	0	0
Perennial streams	48,188	1,433,435	48,065	344,398	0
Intermittent/ephemeralstreams	130,375,835	213,542,849	81,901,598	44,916,235	3,449,894
Canals	17,608,394	8,079,744	956,372	4,404,123	28,561

[a] To convert ft to m, multiply by 0.3048.

Source: USGS (2012a).

TABLE 9.4.9.1-4 Stream Discharge Information Relevant to the Proposed Riverside East SEZ as Revised

Parameter	Station (USGS ID)	
	Colorado River at Palo Verde Dam, California–Arizona (09429010)	Palo Verde Canal near Blythe, California (09429000)
Period of record	1984–1988	1985–2012
No. of observations	49	281
Discharge, median (ft^3/s)[a]	15,000	1,365
Discharge, range (ft^3/s)	3,190–30,150	310–2,290
Discharge, most recent observation (ft^3/s)	9,340	1,160
Distance to SEZ (mi)[b]	22	22

[a] To convert ft^3 to m^3, multiply by 0.0283.

[b] To convert mi to km, multiply by 1.6093.

Source: USGS (2012b).

Land clearing, land leveling, and vegetation removal during the development of the SEZ have the potential to disrupt intermittent/ephemeral stream channels. Several programmatic design features described in Section A.2.2 of Appendix A of this Final Solar PEIS would avoid, minimize, and/or mitigate impacts associated with the disruption of intermittent/ephemeral water features. Additional analyses of intermittent/ephemeral streams are presented in this update, including an evaluation of functional aspects of stream channels with respect to groundwater recharge, flood conveyance, sediment transport, geomorphology, and ecological habitats. Only a summary of the results from these surface water analyses is presented in this section; more information on methods and results is presented in Appendix O.

The study region considered for the intermittent/ephemeral stream evaluation relevant to the Riverside East SEZ is a subset of the Southern Mojave and Imperial Reservoir watersheds (HUC8), for which information regarding stream channels is presented in Tables 9.4.9.1-3 and 9.4.9.1-4 in this Final Solar PEIS. The results of the intermittent/ephemeral stream evaluation are shown in Figures 9.4.9.2-1 and 9.4.9.2-2, which depict flow lines from the National Hydrography Dataset (USGS 2012a) labeled as low, moderate, and high sensitivity to land disturbance. Within the study area, 16% of the intermittent/ephemeral stream channels had low sensitivity, 82% had moderate sensitivity, and 2% had high sensitivity to land disturbance. Several intermittent/ephemeral stream reaches with moderate sensitivity to land disturbance are found within the SEZ. High concentrations of these sensitive stream reaches are located along the western boundary just north of Desert Center (Figure 9.4.9.2-1), along the western face of the McCoy Mountains (Figure 9.4.9.2-1), and in the northeastern portion of the SEZ (Figure 9.4.9.2-2).

TABLE 9.4.9.1-5 Surface Water Quality Data Relevant to the Proposed Riverside East SEZ as Revised

Parameter	Station (USGS ID)[a]	
	09429010	09429030
Period of record	1986	1961–1983
No. of records	1	827
Temperature (°C)[b]	26	20 (1.7–31.5)
Total dissolved solids (mg/L)	NA[c]	1,170 (722–1,670)
Dissolved oxygen (mg/L)	8.3	NA
pH	8	7.9 (7.1–8.3)
Total nitrogen (mg/L)	NA	NA
Phosphorus (mg/L as P)	NA	NA
Organic carbon (mg/L)	NA	NA
Calcium (mg/L)	NA	137.5 (91–190)
Magnesium (mg/L)	NA	44 (28–85)
Sodium (mg/L)	NA	210 (110–320)
Chloride (mg/L)	NA	172 (90–980)
Sulfate (mg/L)	NA	480 (220–680)
Arsenic (µg/L)	2	NA

[a] Median values are listed; the range in values is shown in parentheses.

[b] To convert °C to °F, multiply by 1.8, then add 32.

[c] NA = no data collected for this parameter.

Source: USGS (2012b).

9.4.9.2.2 Water Use Requirements for Solar Energy Technologies

Changes in the Riverside East SEZ boundaries resulted in changes to the estimated water use requirements and a reduction in the land affected by surface disturbances. This section presents changes in water use estimates for the reduced SEZ area and additional analyses pertaining to groundwater. The additional analyses of groundwater include a basin-scale groundwater budget and a simplified, one-dimensional groundwater model of potential groundwater drawdown. Only a summary of the results from these groundwater analyses is presented in this section; more information on methods and results is presented in Appendix O.

Table 9.4.9.2-1 presents the revised estimates of water requirements for both construction and operation of solar facilities at the Riverside East SEZ, assuming 80% build-out of the SEZ and accounting for its decreased size. A basin-scale groundwater budget was assembled using available data on groundwater inputs, outputs, and storage for both the Chuckwalla Valley and Palo Verde Mesa groundwater basins, with results presented in Table 9.4.9.2-2.

TABLE 9.4.9.1-6 Water Quality Data from Groundwater Samples Relevant to the Proposed Riverside East SEZ as Revised

	Station (USGS ID)[a]	
Parameter	333939114411501	332828114443501
Period of record	1967	1980-1981
No. of records	1	8
Temperature (°C)[b]	32	21.3 (18.4–23.3)
Total dissolved solids (mg/L)	NA[c]	5,910 (5,800–6,350)
Dissolved oxygen (mg/L)	NA	NA
pH	7.5	8.35 (8.1–8.5)
Nitrate + nitrite (mg/L as N)	NA	NA
Phosphate (mg/L)	NA	NA
Organic carbon (mg/L)	NA	NA
Calcium (mg/L)	154	73.5 (65–80)
Magnesium (mg/L)	9.4	39.35 (36.6–42.7)
Sodium (mg/L)	NA	1,995 (1,800–2,150)
Chloride (mg/L)	578	1,565 (1,540–1,750)
Sulfate (mg/L)	475	1,985 (1,910–2,090)
Arsenic (µg/L)	NA	NA
Fluoride (mg/L)	NA	NA
Boron (µg/L)	NA	NA

[a] Median values are listed; the range in values is shown in parentheses.

[b] To convert °C to °F, multiply by 1.8, then add 32.

[c] NA = no data collected for this parameter.

Source: USGS (2012b).

TABLE 9.4.9.1-7 Groundwater Surface Elevations Relevant to the Proposed Riverside East SEZ as Revised

	Station (USGS ID)	
Parameter	334438115211101	333939114411501
Period of record	1952–1992	1968–2011
No. of observations	5	71
Surface elevation (ft)[a]	598	400
Well depth (ft)	347	252
Depth to water, median (ft)	199.29	147.39
Depth to water, range (ft)	108–112.86	146.15–157.76
Depth to water, most recent observation (ft)	188.38	147.08
Distance to SEZ (mi)[b]	26	12

[a] To convert ft to m, multiply by 0.3048.

[b] To convert mi to km, multiply by 1.6093.

Source: USGS (2012b).

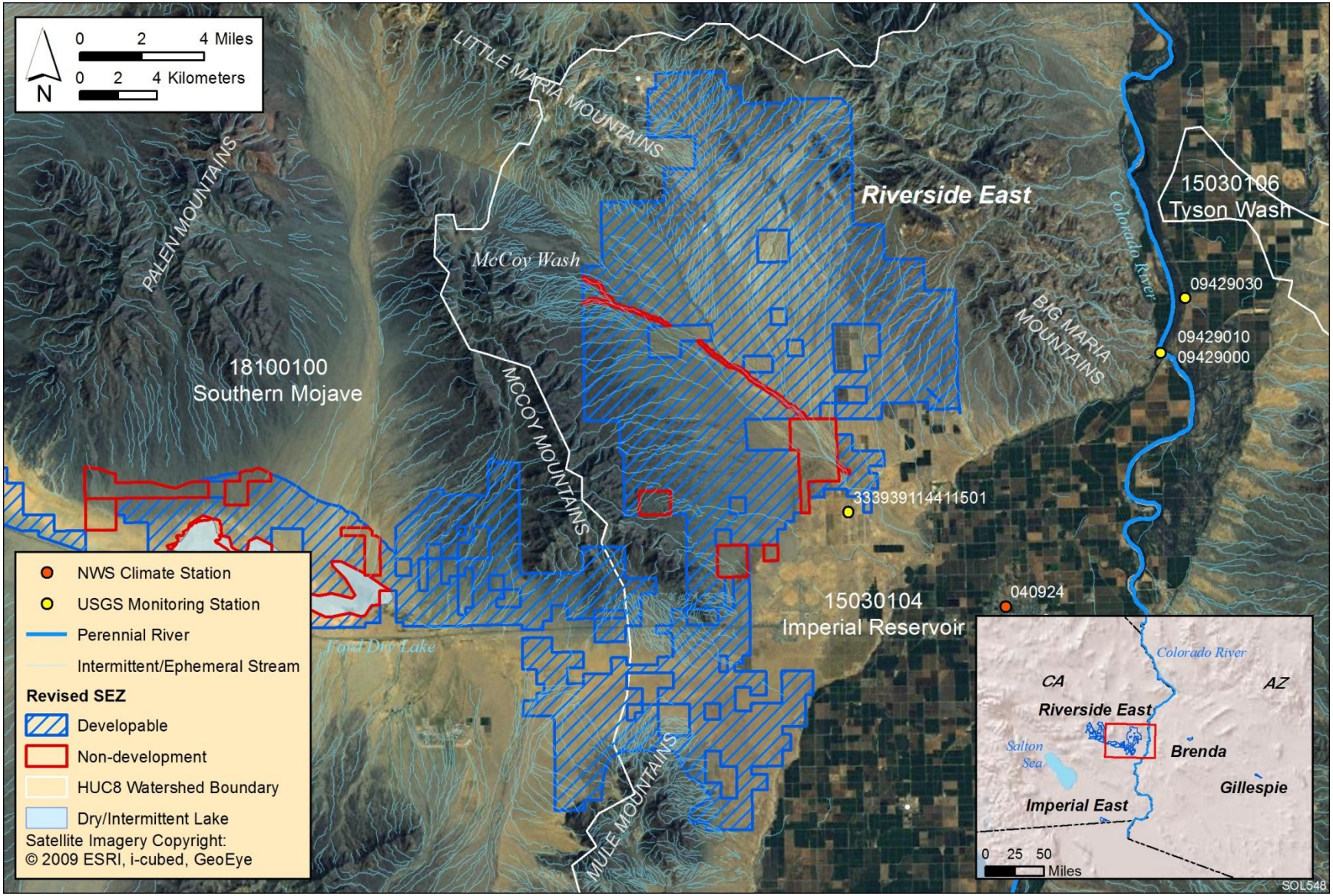

FIGURE 9.4.9.1-1 Water Features near the Proposed Riverside East SEZ as Revised, Eastern Half

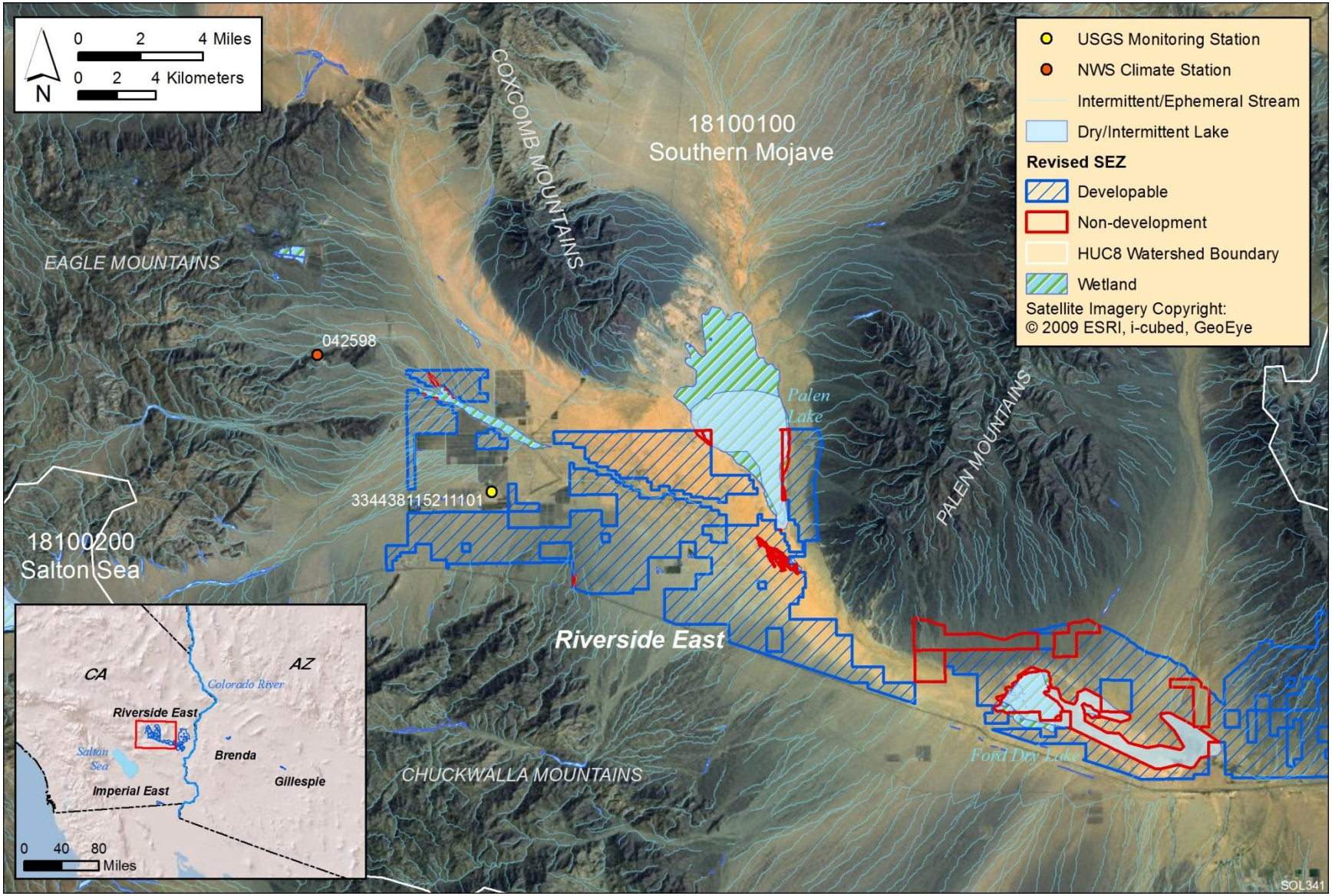

FIGURE 9.4.9.1-2 Water Features near the Proposed Riverside East SEZ as Revised, Western Half

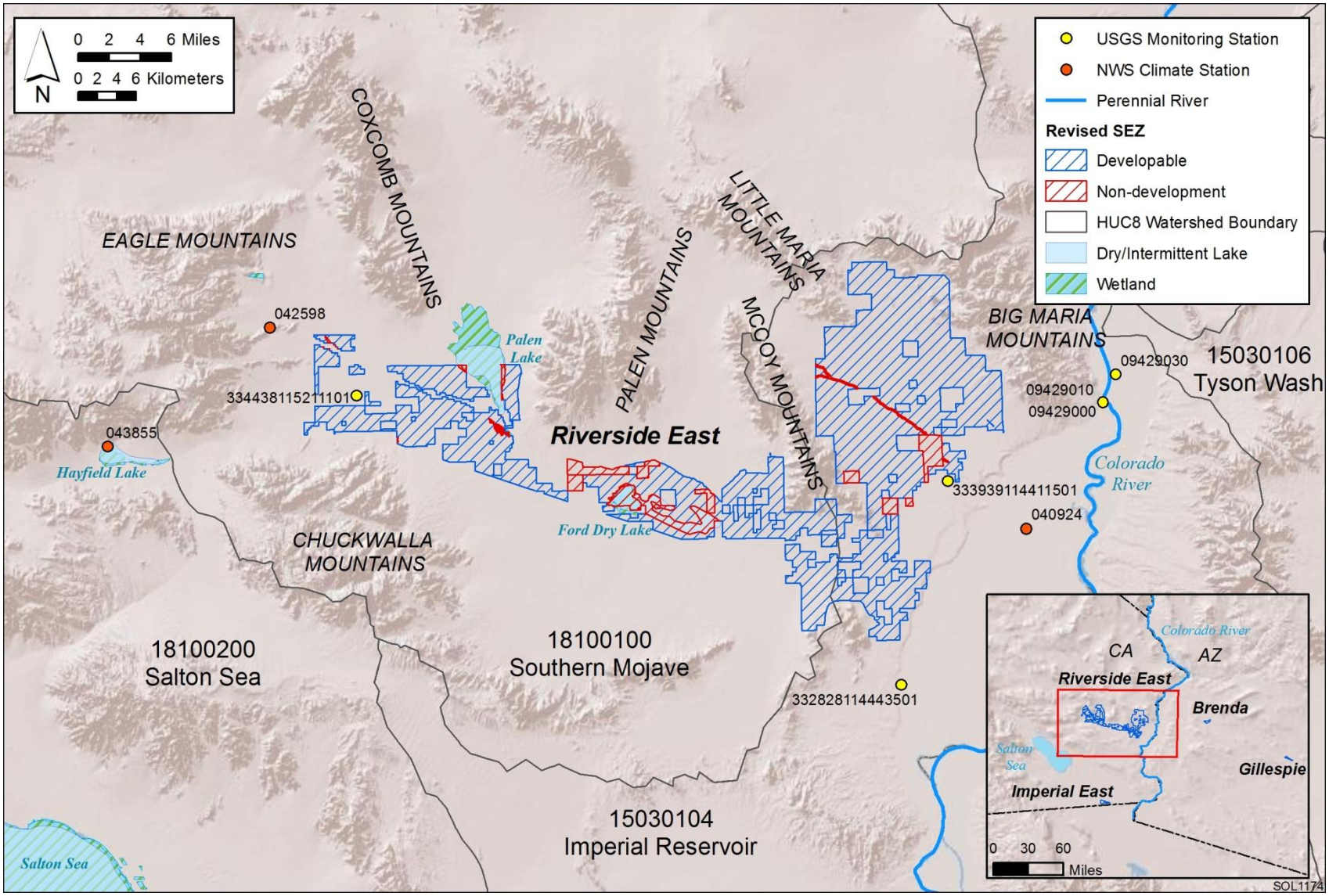

FIGURE 9.4.9.1-3 Water Features within the Southern Mojave and Imperial Reservoir Watersheds, Which Include the Proposed Riverside East SEZ as Revised

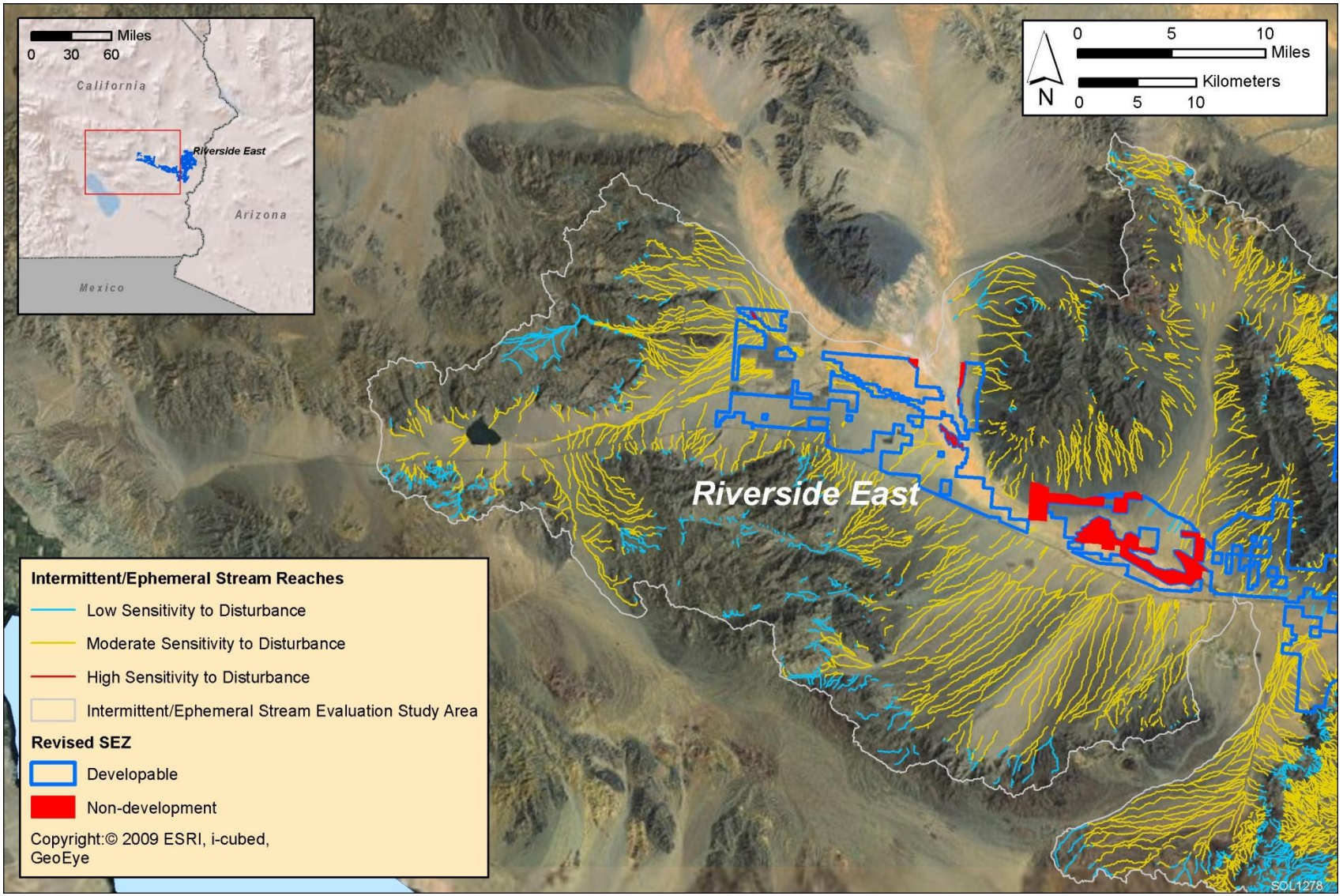

FIGURE 9.4.9.2-1 Intermittent/Ephemeral Stream Channel Sensitivity to Surface Disturbances in the Vicinity of the Western Portion of the Proposed Riverside East SEZ as Revised

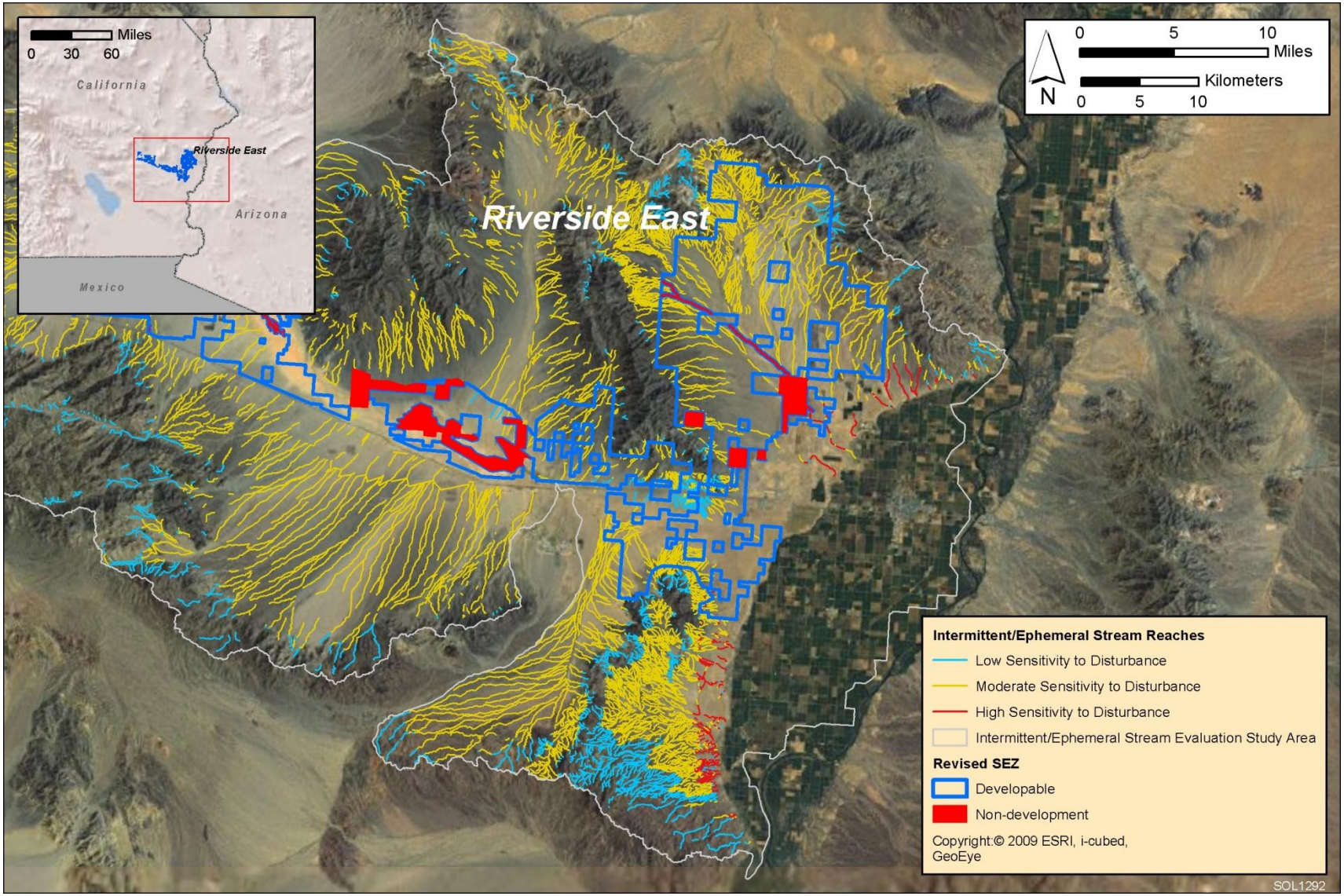

FIGURE 9.4.9.2-2 Intermittent/Ephemeral Stream Channel Sensitivity to Surface Disturbances in the Vicinity of the Eastern Portion of the Proposed Riverside East SEZ as Revised

TABLE 9.4.9.2-1 Estimated Water Requirements for the Proposed Riverside East SEZ as Revised[a]

Activity	Parabolic Trough	Power Tower	Dish Engine	PV
Construction—Peak Year				
Water use requirements				
Fugitive dust control (ac-ft)[b]	4,452	6,678	6,678	6,678
Potable supply for workforce (ac-ft)	222	135	56	28
Total water use requirements (ac-ft)	4,674	6,813	6,734	6,706
Wastewater generated				
Sanitary wastewater (ac-ft)	222	135	56	28
Operations				
Water use requirements				
Mirror/panel washing (ac-ft/yr)	11,833	6,574	6,574	657
Potable supply for workforce (ac-ft/yr)	332	147	147	15
Dry cooling (ac-ft/yr)	4,733–23,666	2,630–13,148	NA	NA
Wet cooling (ac-ft/yr)	106,495–343,151	59,164–190,640	NA	NA
Total water use requirements				
Non-cooled technologies (ac-ft/yr)	NA[c]	NA	6,721	672
Dry-cooled technologies (ac-ft/yr)	16,898–35,831	9,351–19,869	NA	NA
Wet-cooled technologies (ac-ft/yr)	118,660–335,316	65,885–197,361	NA	NA
Wastewater generated				
Blowdown (ac-ft/yr)	6,723	3,735	NA	NA
Sanitary wastewater (ac-ft/yr)	332	147	147	15

[a] See Section M.9.2 of Appendix M of the Draft Solar PEIS for methods used in estimating water use requirements.

[b] To convert ac-ft to m^3, multiply by 1,234.

[c] NA = not applicable.

The estimated total water use requirements during the peak construction year would be as high as 6,813 ac-ft/yr (8.4 million m^3/yr), which is approximately 33% of the annual groundwater inputs to the Chuckwalla Valley and Palo Verde Mesa groundwater basins combined, but less than 1% of the estimated groundwater storage in the Chuckwalla Valley. This level of groundwater pumping could cause localized groundwater drawdown impacts, but given the short duration of construction activities, the water use estimate for construction is not a primary concern to water resources in the region.

The long duration of groundwater pumping during operations (20 years) poses the greatest threat to groundwater resources in the region. The water use estimates for full build out of wet-cooled solar facilities is as high as 118,660 ac-ft/yr (146 million m^3/yr), assuming a 30% operation time (a 30% operational time was considered for all solar facility types on the

basis of operations estimates for proposed utility-scale solar energy facilities; data suggest that full build-out assuming 60% operation time is not achievable) at the Riverside East SEZ. This level of groundwater extraction far exceeds any of the groundwater recharge, discharge, and storage magnitudes presented in Table 9.4.9.2-2, which makes it an unfeasible development scenario to consider.

The additional groundwater budget and one-dimensional modeling analyses considered low, medium, and high groundwater pumping scenarios that represent a full build-out of PV, one-half the amount of water needed for full build-out of dry-cooled parabolic trough (30% operational time), and the full amount of water for full build-out of dry-cooled parabolic trough (30% operational time), respectively. The low, medium, and high pumping scenarios result in groundwater withdrawals that range from 672 to 16,898 ac-ft/yr (829,000 to 20.8 million m^3/yr), or 13,440 to 337,960 ac-ft (16.6 million to 417 million m^3) over the 20-year operational period. From a groundwater budgeting perspective, the high pumping scenario of full build-out of dry cooled facilities is similar to the combined groundwater inputs to the Chuckwalla and Palo Verde Mesa groundwater basins, and over the 20-year analysis period it represents 38% of the groundwater storage in the Chuckwalla basin. The medium pumping scenario (one-half the water needs for full build-out of dry-cooled facilities) is similar to the amount of groundwater recharge via precipitation and mountain front recharge for the entire Chuckwalla Valley. The low pumping scenario over the 20-year analysis period represents 1.5% of the groundwater storage in the Chuckwalla Valley.

Groundwater budgeting allows for quantification of complex groundwater processes at the basin scale, but it ignores the temporal and spatial components of how groundwater withdrawals affect groundwater surface elevations, groundwater flow rates, and connectivity to surface water features such as streams, wetlands, playas, and riparian vegetation. A one-dimensional groundwater modeling analysis was performed to present a simplified depiction of the spatial and temporal effects of groundwater withdrawals by examining groundwater drawdown in a radial direction around the center of the SEZ for the low, medium, and high pumping scenarios. The specifics of the groundwater modeling analysis are presented in Appendix O. Note, however, that the aquifer parameters used for the one-dimensional groundwater model (Table 9.4.9.2-3) represent available literature data, and that the model aggregates these value ranges into a simplistic representation of the aquifer. For the one-dimensional groundwater modeling analysis of the Riverside East SEZ, groundwater modeling parameters presented in the analysis by Leake et al. (2008) were used. This approach uses lower- and upper-bound estimates of transmissivity to capture potential groundwater drawdown with respect to heterogeneity of the aquifer.

Depth to groundwater ranges between 80 and 270 ft (24 and 82 m) below the surface across the Chuckwalla Valley and Palo Verde Mesa. Figure 9.4.9.2-3 shows the groundwater modeling results for the upper bound of the transmissivity parameter. Groundwater drawdown ranges up to 100 ft (30 m) for the high pumping scenario, up to 50 ft (15 m) for the medium pumping scenario, and up to 5 ft (1.5 m) for the low pumping scenario. Groundwater drawdown

TABLE 9.4.9.2-2 Groundwater Budget for the Chuckwalla Valley and Palo Verde Mesa Groundwater Basins, Which Include the Proposed Riverside East SEZ as Revised

Process	Amount
Chuckwalla Valley Groundwater Basin (western and central portions of SEZ)	
Inputs	
Recharge from precipitation (ac-ft/yr)[a]	8,588
Underflow-Pinto/Orocopia Valleys (ac-ft/yr)	3,500
Irrigation return flows (ac-ft/yr)	800
Wastewater lagoon return flows (ac-ft/yr)	831
Outputs	
Groundwater withdrawals (ac-ft/yr)	10,361
Underflow to Palo Verde Mesa (ac-ft/yr)	400
Evapotranspiration – Palen Lake (ac-ft/yr)	350
Storage	
Storage – 100 ft of saturated aquifer (ac-ft)[b]	900,000
Groundwater storage capacity (ac-ft)[b,c]	9,100,000
Palo Verde Mesa Groundwater Basin (eastern portion of SEZ)	
Inputs	
Recharge from precipitation (ac-ft/yr)	3,086
Underflow-Chuckwalla/Palo Verde Mesa (ac-ft/yr)	2,844
Irrigation return flows (ac-ft/yr)	770
Outputs	
Groundwater withdrawals (ac-ft/yr)	6,700
Storage	
Groundwater storage capacity (ac-ft)[b,c]	6,840,000

[a] To convert ac-ft to m^3, multiply by 1,234.

[b] CDWR (2004)

[c] Groundwater storage capacity is the potential storage based on aquifer dimensions, not the actual groundwater storage.

Sources: BLM (2010b, e)

assuming high transmissivity is primarily limited to a 6-mi (10 km) radius from the center of pumping. Figure 9.4.9.2-3 also shows the groundwater modeling results for the lower bound of the transmissivity parameter. Groundwater drawdown ranges up to 375 ft (114 m) for the high pumping scenario, up to 180 ft (55 m) for the medium pumping scenario, and up to 15 ft (6 m) for the low pumping scenario. Groundwater drawdown assuming low transmissivity is primarily limited to a 3-mi (5-km) radius from the center of pumping.

TABLE 9.4.9.2-3 Aquifer Characteristics and Assumptions Used in the One-Dimensional Groundwater Model for the Proposed Riverside East SEZ as Revised

Parameter	Value
Aquifer type/conditions	Unconfined/basin fill
Aquifer thickness (ft)[a]	500
Transmissivity (ft^2/day)	6,300–26,200
Specific yield	0.2
Analysis period (yr)	20
High pumping scenario (ac-ft/yr)[b]	16,898
Medium pumping scenario (ac-ft/yr)	8,449
Low pumping scenario (ac-ft/yr)	672

[a] To convert ft to m, multiply by 0.3048.

[b] To convert ac-ft to m^3, multiply by 1,234.

Source: Leake et al. (2008).

The one-dimensional groundwater modeling results presented in Figure 9.4.9.2-3 is a simplified representation of potential impacts on groundwater resulting from groundwater withdrawals for solar energy development. Given the size of the Riverside East SEZ and the large quantities of groundwater withdrawals, it is likely that several groundwater wells would be needed and these wells would be distributed across the SEZ, whereas the modeling results assume one well. Groundwater well capacities within the vicinity of the Riverside East SEZ have been reported to range from 40 to 105 ac-ft/yr/ft-drawdown (443 to 1,165 m^3/day/m-drawdown) (BLM 2010b), which suggests that groundwater wells could probably be expected to withdraw on the order of 4,000 ac-ft/yr (4.9 million m^3/yr) as a high-end estimate.

The management of the Colorado River under the various laws, compacts, and decrees known as the "Law of the River" affects how much groundwater can be withdrawn from the Riverside East SEZ, because both the Chuckwalla Valley and Palo Verde Mesa groundwater basins are considered to be within the Colorado River's floodplain. As described in the Draft Solar PEIS, the USGS developed a method for quantifying the Colorado River Accounting Surface, which defines groundwater surface elevations that below which the groundwater is considered to be waters replenished by Colorado River Water and subject to management under the Law of the River. In the vicinity of the Riverside East SEZ, the Colorado River Accounting Surface is at an elevation of 238 and 240 ft (72.5 and 73 m) (Wiele et al. 2008). Currently, groundwater surface elevations depict a groundwater gradient eastward toward the Colorado River, with groundwater elevations at 488 ft (149 m) near Desert Center, 288 ft (88 m) near Palen Lake, and 245 ft (75 m) near the boundary between the Chuckwalla Valley and Palo Verde Mesa. This information suggests that groundwater drawdown cannot exceed 248 ft (76 m) near Desert Center, 48 ft (15 m) near Palen Lake, and 5 ft (1.5 m) near the Chuckwalla Valley and Palo Verde Mesa boundary. These estimates of allowable groundwater drawdown relative to the Colorado Accounting Surface are guidelines only, and solar energy developers would have to

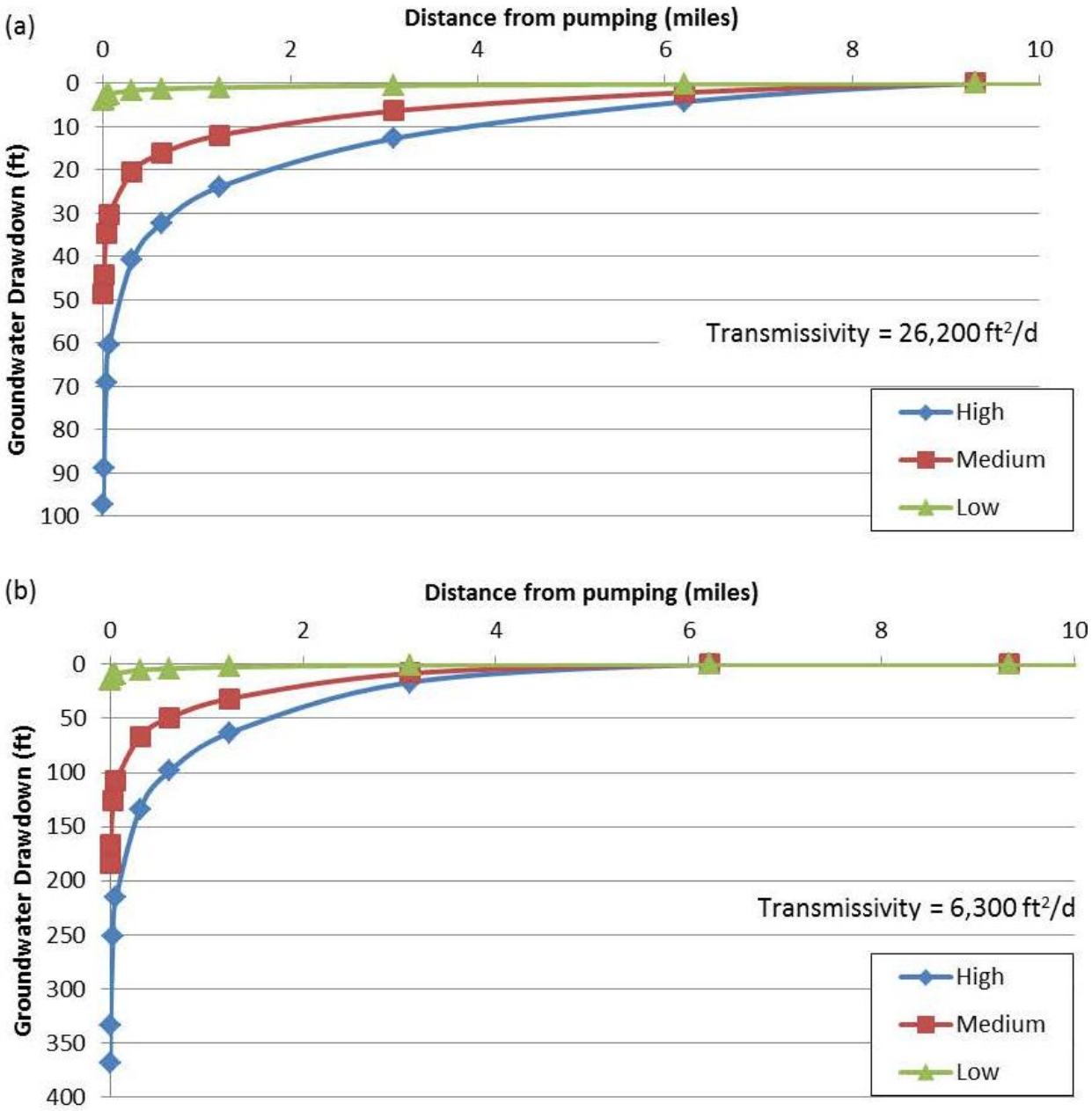

FIGURE 9.4.9.2-3 Estimated One-Dimensional Groundwater Drawdown Resulting from High, Medium, and Low Groundwater Pumping Scenarios over the 20-Year Operational Period at the Proposed Riverside East SEZ as Revised Considering (a) High Transmissivity Values and (b) Low Transmissivity Values

coordinate with the Bureau of Reclamation (BOR) (lead managing agency regarding the Law of the River) regarding any potential groundwater depletions that might affect the Colorado River Accounting Surface.

9.4.9.2.3 Off-Site Impacts: Roads and Transmission Lines

As stated in the Draft Solar PEIS, impacts associated with the construction of roads and transmission lines primarily deal with water use demands for construction, water quality concerns relating to potential chemical spills, and land disturbance effects on the natural hydrology. Water needed for transmission line construction activities (e.g., for soil compaction, dust suppression, and potable supply for workers) could be trucked to the construction area from an off-site source. If this occurred, water use impacts at the SEZ would be negligible. The Draft Solar PEIS assessment of impacts on water resources from road and transmission line construction remains valid.

9.4.9.2.4 Summary of Impacts on Water Resources

The additional information and analyses of water resources presented in this update agree with the information provided in the Draft Solar PEIS, which indicates that the Riverside East SEZ is located in a large desert valley with predominately intermittent/ephemeral surface water features and groundwater in a basin-fill aquifer. The large size of the SEZ corresponds to large estimates of water use for the full build-out scenario (80% of the area developed) and the potential for large land disturbances. The estimated water use requirements assuming full build-out of wet-cooling technologies would not be feasible. The high groundwater pumping scenario considered for this analysis corresponded to full build-out of dry-cooled parabolic trough with a 30% operational time.

The change in boundaries and identified non-development areas of the Riverside East SEZ exclude portions of Palen Lake, Ford Dry Lake, and McCoy Wash. These changes in the SEZ boundaries have reduced potential impacts on surface water features associated with land disturbance. The intermittent/ephemeral stream evaluation identified several stream reaches within the SEZ that have a moderate sensitivity to land disturbance. Many of these intermittent/ephemeral stream reaches within the SEZ are clustered in alluvial fan features along the western boundary just north of Desert Center (Figure 9.4.9.2-1), along the western face of the McCoy Mountains (Figure 9.4.9.2-1) and in the northeastern portion of the SEZ (Figure 9.4.9.2-2). Ultimately, any alterations to intermittent/ephemeral surface water features within the Riverside East SEZ would be subject to permitting by the CDFG's Lake and Streambed Alteration Program.

Groundwater withdrawals for solar energy facilities pose a substantial threat to groundwater resources in the Chuckwalla Valley and the Palo Verde Mesa groundwater basins. The low pumping scenario is preferred over the medium and high pumping scenarios given the results of the groundwater budget and one-dimensional modeling analyses. The vertical and horizontal extent of groundwater drawdown is largely controlled by aquifer characteristics, and

the modeling results for upper and lower bounds of transmissivity shows how a lower tranmissivity value results in a larger vertical groundwater drawdown but with a lesser horizontal effect (Figure 9.4.9.3-3). The potential to withdraw groundwater below the Colorado River Accounting Surface makes understanding potential groundwater drawdown effects crucial in order to not affect the management of the Colorado River under the Law of the River. In addition to the Colorado River Accounting Surface, groundwater drawdown could affect surface water–groundwater interactions, which are particularly important in the vicinity of Palen Lake, which supports groundwater-dependent vegetation communities (see Section 9.4.10 of the Draft Solar PEIS).

Predicting impacts associated with groundwater withdrawal in desert regions is often difficult given the heterogeneity of aquifer characteristics, the long time period between the onset of pumping and its effects, and limited data. One of the primary mitigation measures to protect water resources is the implementation of long-term monitoring and adaptive management (see Section A.2.4 of Appendix A). For groundwater, this requires the combination of monitoring and modeling to fully identify the temporal and spatial extent of potential impacts. The BLM is currently working on the development of a more detailed numerical groundwater model for the Riverside East SEZ, which would more accurately predict potential impacts on surface water features and groundwater drawdown. When the detailed model is completed, it will be made available through the project Web site (http://solareis.anl.gov) for use by applicants, the BLM, and other stakeholders. Initial efforts are focused on modifying the numerical modeling framework developed by Leake et al. (2008), which has been used for assessing impacts for fast-track solar projects within the SEZ (BLM 2010b,e). Further refinement of this modeling framework is needed to have the potential to assess multiple projects on this large SEZ and to include finer-scale resolution of potential impacts on surface water features and the Colorado River Accounting Surface. This modeling framework can also be used to interpret groundwater monitoring data and guide adaptive management plans.

9.4.9.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on surface water and groundwater are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide some protection of and reduce impacts on water resources.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, the following SEZ-specific design features have been identified:

- Groundwater analyses suggest that full build-out of wet-cooled or dry-cooled technologies is not feasible; for mixed-technology development scenarios, any proposed wet- or dry-cooled projects should utilize water conservation practices;

- During site characterization, coordination and permitting with the CDFG regarding California's Lake and Streambed Alteration Program would be required for any proposed alterations to surface water features; and

- The use of groundwater in the Chuckwalla Valley and Palo Verde Mesa should be planned for and monitored in cooperation with the BOR and the USGS in reference to the Colorado River Accounting Surface and the rules set forth in the Law of the River.

The need for additional SEZ-specific design features will be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

9.4.10 Vegetation

9.4.10.1 Affected Environment

Revisions to the boundaries of the proposed Riverside East SEZ have eliminated several wetlands mapped by the NWI and two dry lakes, Palen Lake and Ford Dry Lake, in the western and central portions of the SEZ. In addition, McCoy Wash, a large drainage in the eastern portion of the SEZ, was identified as a non-development area.

As presented in Section 9.4.10.1 of the Draft Solar PEIS, 13 cover types were identified within the area of the proposed Riverside East SEZ, while 16 cover types were identified within 5 mi (8 km) of the SEZ boundary (the indirect effects area). Sensitive habitats on the SEZ include desert dry wash woodlands, desert chenopod scrub/mixed salt desertscrub (primarily associated with Ford Dry Lake), sand dune communities, and playa communities. Characteristic Sonoran Desert species observed on the SEZ include ironwood, western honey mesquite, smoketree, and blue palo verde. Desert dry washes in the SEZ support microphyll woodlands that include ironwood, smoketree, and blue palo verde. An ironwood forest, identified by the BLM as a Unique Plant Assemblage, occurs in the upper reaches of McCoy Wash. Plant communities that are dependent on groundwater include mesquite bosque and bush seep-weed communities, both primarily associated with Palen Lake, where groundwater is relatively shallow. Because of the SEZ boundary changes, the North American Warm Desert Riparian Mesquite Bosque cover type no longer occurs within the SEZ. Figure 9.4.10.1-1 shows the cover types within the affected area of the Riverside East SEZ as revised. Additional information was received regarding rare plants and plant associations on or in the vicinity of the Riverside East SEZ (Suba 2012). Alverson's foxtail cactus (*Coryphantha alversonii* [=*Escobaria alversonii*]) is a rare plant species known only from southern California and is ranked as vulnerable; it is limited in distribution but has a low degree of threats. It occurs in small isolated populations in Mohavean and Sonoran desertscrub on desert pavement, sandy or gravelly soils, alluvial fans, and coarse alluvial deposits (eFloras.org 2010; NatureServe 2010) and may be present in many of the cover types within the SEZ. A number of rare plant associations are also known from the SEZ and vicinity (Table 9.4.10.1-1).

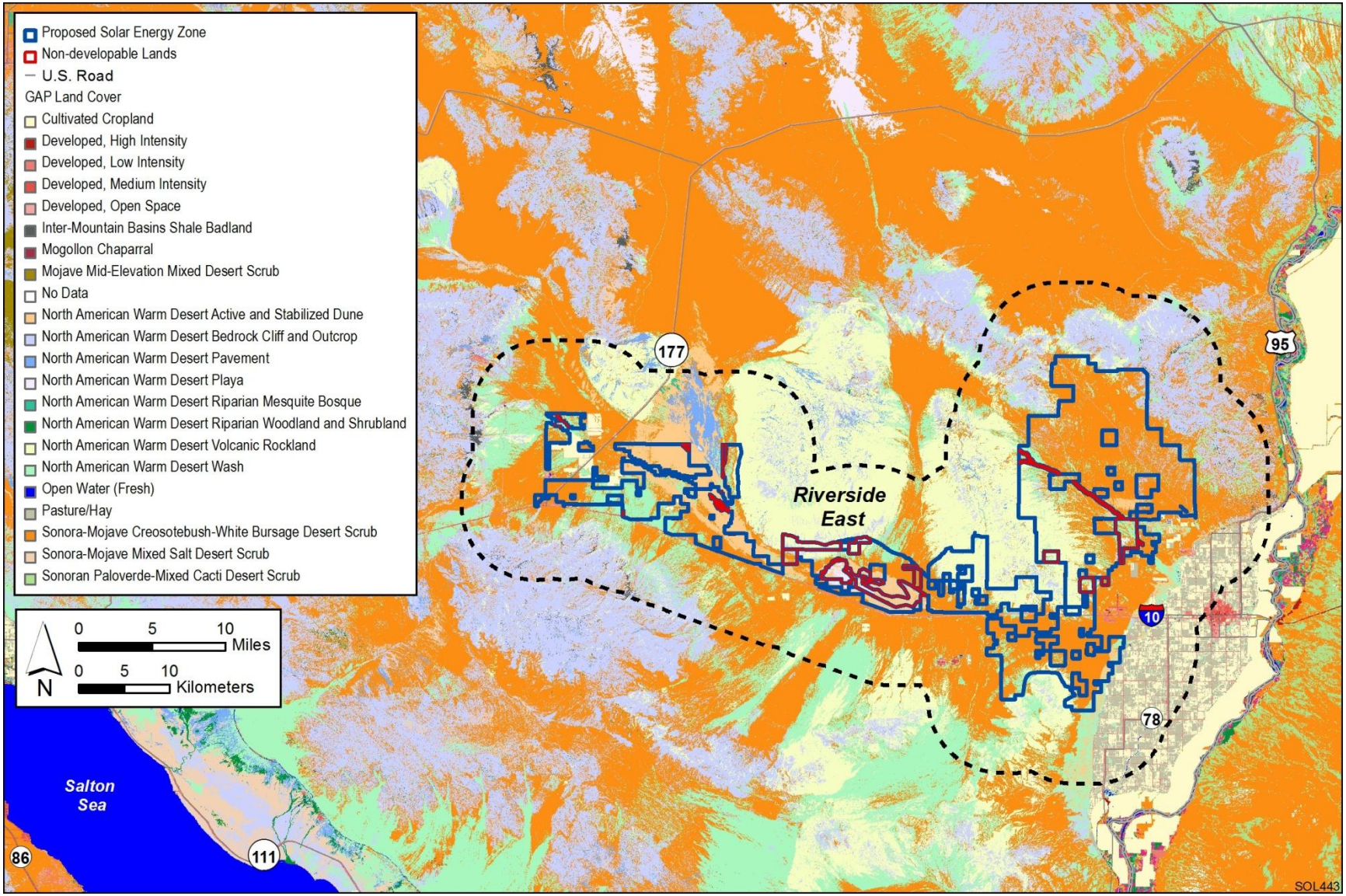

FIGURE 9.4.10.1-1 Land Cover Types within the Proposed Riverside East SEZ as Revised

TABLE 9.4.10.1-1 Vegetation Types Known or Likely to Occur in the Proposed Riverside East SEZ as Revised

Vegetation Type	Species Alliance	Species Association
Tree Dominated Types	*Parkinsonia florida – Olneya tesota* Woodland Alliance[a]	*Parkinsonia florida/Larrea tridentata – Peucephyllum schottii*[a]
		Parkinsonia florida – Olneya tesota[a]
		Parkinsonia florida/(*Psorothamnus emoryi, Pleuraphis rigida*) (provisional dune type)[a]
		Parkinsonia florida – Olneya tesota/Hyptis emoryi[a]
		Parkinsonia florida[a]
		Parkinsonia florida/Hyptis emoryi[a]
		Olneya tesota[a]
		Olneya tesota/Psorothamnus schottii[a]
	Prosopis glandulosa Woodland Alliance[a]	*Prosopis glandulosa – Atriplex* spp.[a]
	Psorothamnus spinosus Woodland Alliance[a]	*Psorothamnus spinosus/Ephedra* (*californica*) *– Ambrosia salsola*
Shrub Dominated Types	*Allenrolfea occidentalis* Shrubland Alliance[a]	*Allenrolfea occidentalis*[a]
	Ambrosia dumosa Shrubland Alliance	*Ambrosia dumosa – Ephedra californica*[a]
	Atriplex canescens Shrubland Alliance	*Atriplex canescens*
	Atriplex polycarpa Shrubland Alliance	*Atriplex polycarpa Sparse Playa*
	Atriplex spinifera Shrubland Alliance[a]	*Atriplex spinifera*[a]
	Encelia farinosa Shrubland Alliance	*Encelia farinose*

TABLE 9.4.10.1-1 (Cont.)

Vegetation Type	Species Alliance	Species Association
Shrub Dominated Types (Cont.)	*Larrea tridentata* Shrubland Alliance	*Larrea tridentate*
		Larrea tridentata – Atriplex polycarpa
		Larrea tridentata/Cryptogamic crust
		Larrea tridentata/Pleuraphis rigida[a]
	Larrea tridentata – Ambrosia dumosa Shrubland Alliance	*Larrea tridentata – Ambrosia dumosa*
		Larrea tridentata – Ambrosia dumosa – Krameria grayi
		Larrea tridentata – Ambrosia dumosa – Fouquieria splendens[a]
		Larrea tridentata – Ambrosia dumosa – Olneya tesota[a]
		Larrea tridentata – Ambrosia dumosa – Psorothamnus spinosus[a]
		Larrea tridentata – Ambrosia dumosa/Cryptogramic crust
	Larrea tridentata – Encelia farinosa Shrubland Alliance	*Larrea tridentata – Encelia farinosa*
		Larrea tridentata – Encelia farinosa – Ambrosia dumosa
	Pluchea sericea Shrubland Alliance[a]	*Pluchea sericea*[a]
	Suaeda moquinii Shrubland Alliance[a]	*Suaeda moquinii*[a]
Herbaceous Types	*Brassica* (*tournefortii*) Herbaceous Semi-Natural Stands	*Brassica tournefortii/Ambrosia dumosa*
	Pleuraphis rigida Herbaceous Alliance	*Pleuraphis rigida*[a] *(in desert washes and on dunes)*
		Pleuraphis rigida/Ephedra (californica)[a]
	Dicoria canescens – Abronia villosa Herbaceous Alliance[a]	*Dicoria canescens*[a]
		Salsola tragus – Oenothera deltoides[a] (provisional dune type based on observation)

TABLE 9.4.10.1-1 (Cont.)

Vegetation Type	Species Alliance	Species Association
Herbaceous Types (Cont.)	*Petalonyx thurberi* Provisional Herbaceous Stands[a]	(provisional sandy type based on observation in area and recent data collection on NPS lands)
	Wislizenia refracta Herbaceous Special Stands[a]	
Miscellaneous Land Use Types	*Simmondsia chinensis* plantations and other agricultural field	

[a] Considered as statewide rare or of high priority for inventory.

Source: Suba (2012).

9.4.10.2 Impacts

As presented the Draft Solar PEIS, the construction of solar energy facilities within the proposed Riverside East SEZ would result in direct impacts on plant communities because of the removal of vegetation within the facility footprint during land-clearing and land-grading operations. Approximately 80% of the SEZ would be expected to be cleared with full development of the SEZ. Within the Riverside East SEZ (as revised), approximately 118,328 acres (478.86 km^2) would be cleared.

Overall impact magnitude categories were based on professional judgment and include (1) *small*: a relatively small proportion (≤1%) of the cover type within the SEZ region would be lost; (2) *moderate*: an intermediate proportion (>1 but ≤10%) of a cover type would be lost; and (3) *large*: >10% of a cover type would be lost.

9.4.10.2.1 Impacts on Native Species

The analysis presented in the Draft Solar PEIS for the Riverside East SEZ indicated that development would result in a large impact on one cover type, a moderate impact on eight cover types, and a small impact on all other land cover types occurring within the SEZ (Table 9.4.11.1-1 in the Draft Solar PEIS). Development within the revised Riverside East SEZ could still directly affect most of the cover types evaluated in the Draft Solar PEIS, with the exception of North American Warm Desert Riparian Mesquite Bosque (previously moderate impact); the reduction in the developable area would result in reduced impact levels on all cover types in the affected area. The impact magnitude for North American Warm Desert Playa and North American Warm Desert Pavement (both previously moderate) would be reduced to small. The impact magnitudes on all other land cover types would remain unchanged, compared to the original estimates in the Draft Solar PEIS.

Direct impacts on the NWI-mapped wetlands as well as on Palen Lake and Ford Dry Lake within the excluded and non-developable portions of the SEZ would not occur. However, direct impacts on unmapped wetlands within the remaining developable areas of the SEZ, dry wash, dry wash woodland, and ironwood (including those outside of washes) communities could still occur. In addition, indirect impacts on wetlands or dry lakes within or near the SEZ, as described in the Draft Solar PEIS, could occur. Indirect impacts on desert chenopod scrub/mixed salt desertscrub, primarily associated with Ford Dry Lake, as well as indirect impacts on mesquite bosque and bush seep-weed communities, both primarily associated with Palen Lake, could occur. Indirect impacts from groundwater use on wetlands and habitats such as mesquite bosque, microphyll (palo verde/ironwood) woodland communities (including ironwood and palo verde located outside of washes), dry wash scrub, and bush seep-weed communities, and communities located around dry lakes and playas in the region could also occur. Because McCoy Wash is excluded from development, direct impacts on the ironwood forest habitat in the wash would not occur. However, indirect impacts on habitats within the wash may occur. Direct or indirect impacts on Alverson's foxtail cactus or any of the rare plant associations listed in Table 9.4.10.1-1 could occur as a result of development within the SEZ. Impacts would depend on specific locations of project components.

9.4.10.2.2 Impacts from Noxious Weeds and Invasive Plant Species

As presented the Draft Solar PEIS, land disturbance from project activities and indirect effects of construction and operation within the Riverside East SEZ could potentially result in the establishment or expansion of noxious weeds and invasive species populations, potentially including those species listed in Section 9.4.10.1 of the Draft Solar PEIS. Impacts such as reduced restoration success and possible widespread habitat degradation could still occur; however, a small reduction in the potential for such impacts would result from the reduced developable area of the SEZ.

9.4.10.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on vegetation are described in Section A.2.2 of Appendix A of this Final Solar PEIS. SEZ-specific species and habitats will determine how programmatic design features are applied, for example:

- All wetland, sand dune and sand transport areas, riparian, playa, dry wash (including dry wash microphyll woodland), ironwood (including those outside of washes), and chenopod scrub habitats within the Riverside East SEZ shall be avoided to the extent practicable, and any impacts minimized and/or mitigated in consultation with appropriate agencies. A buffer area shall be maintained around wetland, riparian, playa, and dry wash communities to reduce the potential for impacts on these communities on or near the SEZ.

- A qualified botanist or plant ecologist shall survey for Alverson's foxtail cactus prior to any construction activities within the SEZ. If individuals are

located, individuals or populations shall be avoided through fencing and flagging of the area, including an appropriate buffer zone.

- Rare species associations listed in Table 9.4.10.1-1 shall be avoided through fencing and flagging of the area, including an appropriate buffer zone.

- Appropriate engineering controls shall be used to minimize impacts on wetland, playa, dry wash woodland, riparian, and chenopod scrub habitats, including downstream occurrences, resulting from surface water runoff, erosion, sedimentation, altered hydrology, accidental spills, or fugitive dust deposition to these habitats. Appropriate buffers and engineering controls would be determined through agency consultation.

- Groundwater withdrawals shall be limited to reduce the potential for indirect impacts on riparian habitat associated with groundwater discharge or groundwater-dependent communities, such as mesquite bosque, microphyll (palo verde/ironwood) communities, dry wash scrub, or bush seepweed communities, and communities located around dry lakes and playas.

It is anticipated that implementation of the programmatic design features will reduce a high potential for impacts from invasive species and impacts on wetland, sand dune, playa, dry wash (including dry wash microphyll woodland), riparian, and chenopod scrub habitats to a minimal potential for impact. Residual impacts on wetlands could result from remaining groundwater withdrawal and so forth; however, it is anticipated that these impacts would be avoided in the majority of instances.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for vegetation have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

9.4.11 Wildlife and Aquatic Biota

For the assessment of potential impacts on wildlife and aquatic biota, overall impact magnitude categories were based on professional judgment and include (1) *small*: a relatively small proportion (≤1%) of the species' habitat within the SEZ region would be lost; (2) *moderate*: an intermediate proportion (>1 but ≤10%) of the species' habitat would be lost; and (3) *large*: >10% of the species' habitat would be lost.

9.4.11.1 Amphibians and Reptiles

9.4.11.1.1 Affected Environment

As presented in Section 9.4.11.1 of the Draft Solar PEIS, representative amphibian and reptile species expected to occur within the Riverside East SEZ include the Couch's spadefoot (*Scaphiopus couchii*), red-spotted toad (*Bufo punctatus*), desert horned lizard (*Phrynosoma platyrhinos*), long-nosed leopard lizard (*Gambelia wislizenii*), Mojave fringe-toed lizard (*Uma scoparia*), side-blotched lizard (*Uta stansburiana*), western banded gecko (*Coleonyx variegatus*), and zebra-tailed lizard (*Callisaurus draconoides*), coachwhip (*Masticophis flagellum*), glossy snake (*Arizona elegans*), gophersnake (*Pituophis catenifer*), groundsnake (*Sonora semiannulata*), and long-nosed snake (*Rhinocheilus lecontei*). The Mojave rattlesnake (*Crotalus scutulatus*) and sidewinder (*C. cerastes*) would be the most common poisonous snake species expected to occur on the SEZ. The reduction in the size of and developable area within the Riverside East SEZ does not alter the potential for these species to occur in the affected area.

9.4.11.1.2 Impacts

As presented in the Draft Solar PEIS, solar energy development within the Riverside East SEZ could affect potentially suitable habitats for the representative amphibian and reptile species. The analysis presented in the Draft Solar PEIS for the Riverside East SEZ indicated that development would result in a moderate overall impact on the representative amphibian and reptile species (Table 9.4.11.1-1 in the Draft Solar PEIS). The reduction in the boundaries and the developable area within the Riverside East SEZ would result in reduced habitat impacts for all representative amphibian and reptile species; however, the resultant impact levels for all the representative species would remain moderate.

9.4.11.1.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on amphibian and reptile species are described in Section A.2.2 of Appendix A of this Final Solar PEIS. With implementation of required programmatic design features, impacts on amphibian and reptile species will be reduced.

Because of the changes to the boundaries and developable area with the SEZ, the SEZ-specific design feature identified in Section 9.4.11.1.3 of the Draft Solar PEIS (i.e., the avoidance of ephemeral drainages, intermittent lakes, and major washes) is no longer applicable. On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for amphibian and reptile species have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

9.4.11.2 Birds

9.4.11.2.1 Affected Environment

As presented in the Draft Solar PEIS, a large number of bird species could occur or have potentially suitable habitat within the affected area of the proposed Riverside East SEZ. Representative bird species identified in the Draft Solar PEIS included (1) shorebirds: killdeer (*Charadrius vociferus*) and least sandpiper (*Calidris minutilla*); (2) passerines: ash-throated flycatcher (*Myiarchus cinerascens*), black-tailed gnatcatcher (*Polioptila melanura*), black-throated sparrow (*Amphispiza bilineata*), Brewer's sparrow (*Spizella breweri*), cactus wren (*Campylorhynchus brunneicapillus*), common poorwill (*Phalaenoptilus nuttallii*), common raven (*Corvus corax*), Costa's hummingbird (*Calypte costae*), crissal thrasher (*Toxostoma crissale*), greater roadrunner (*Geococcyx californianus*), green-tailed towhee (*Pipilo chlorurus*), horned lark (*Eremophila alpestris*), house finch (*Carpodacus mexicanus*), ladder-backed woodpecker (*Picoides scalaris*), Le Conte's thrasher (*Toxostoma lecontei*), lesser nighthawk (*Chordeiles acutipennis*), loggerhead shrike (*Lanius ludovicianus*), phainopepla (*Phainopepla nitens*), sage sparrow (*Amphispiza belli*), Say's phoebe (*Sayornis saya*), verdin (*Auriparus flaviceps*), and white-throated swift (*Aeronautes saxatalis*); (3) raptors: American kestrel (*Falco sparverius*), burrowing owl (*Athene cunicularia*), ferruginous hawk (*Buteo regalis*), prairie falcon (*Falco mexicanus*), red-tailed hawk (*Buteo jamaicensis*), and turkey vulture (*Cathartes aura*); and (4) upland gamebirds: Gambel's quail (*Callipepla gambelii*), mourning dove (*Zenaida macroura*), and white-winged dove (*Zenaida asiatica*). The reduction in the boundaries and the developable area within the Riverside East SEZ does not alter the potential for these species or other bird species to occur in the affected area.

9.4.11.2.2 Impacts

As presented in the Draft Solar PEIS, solar energy development within the Riverside East SEZ could affect potentially suitable bird habitats. The analysis presented in the Draft Solar PEIS for the Riverside East SEZ boundaries and developable area indicated that development would result in a moderate overall impact on most representative bird species and a small impact on the least sandpiper, house finch, white-throated swift, and red-tailed hawk (Table 9.4.11.2-1 in the Draft Solar PEIS). The reduction in the boundaries and developable area of the Riverside East SEZ would result in reduced habitat impacts for all representative bird species; however, the resultant impact levels for most of the representative bird species would remain as moderate or small. The impact level for the least sandpiper would change from moderate to small.

9.4.11.2.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on bird species are described in Section A.2.2 of Appendix A of this Final Solar PEIS. SEZ-specific species and habitats will determine how programmatic design features are applied, for example:

- Plant species that positively influence the presence and abundance of the desert bird focal species be avoided to the extent practicable. These species include Goodding's willow (*Salix gooddingii*), Joshua tree (*Yucca brevifolia*), honey mesquite (*Prosopis glandulosa*), screwbean mesquite (*P. pubescens*), Colorado desert mistletoe (*Phoradendron macrophyllum*), quailbush (*Atriplex lentiformis*), and catclaw acacia (*Acacia greggii*).

With the implementation of programmatic design features, impacts on bird species will be reduced.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes in the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

9.4.11.3 Mammals

9.4.11.3.1 Affected Environment

As presented in the Draft Solar PEIS, a large number of mammal species were identified that could occur or have potentially suitable habitat within the affected area of the proposed Riverside East SEZ. Representative mammal species identified in the Draft Solar PEIS included (1) big game species: cougar (*Puma concolor*) and mule deer (*Odocoileus hemionus*); (2) furbearers and small game species: the American badger (*Taxidea taxus*), black-tailed jackrabbit (*Lepus californicus*), bobcat (*Lynx rufus*), coyote (*Canis latrans*), desert cottontail (*Sylvilagus audubonii*), round-tailed ground squirrel (*Spermophilus tereticaudus*), and white-tailed antelope squirrel (*Ammospermophilus leucurus*); and (3) small nongame species: the cactus mouse (*Peromyscus eremicus*), canyon deermouse (*P. crinitus*), desert kangaroo rat (*Dipodomys deserti*), desert shrew (*Notiosorex crawfordi*), desert woodrat (*Neotoma lepida*), little pocket mouse (*Perognathus longimembris*), long-tailed pocket mouse (*Chaetodipus formosus*), Merriam's kangaroo rat (*Dipodomys merriami*), and southern grasshopper mouse (*Onychomys torridus*). The ranges of nine bat species encompass the SEZ: big brown bat (*Eptesicus fuscus*), Brazilian free-tailed bat (*Tadarida brasiliensis*), Californian leaf-nosed bat (*Macrotus californicus*), California mastiff bat (*Eumops perotis californicus*), California myotis (*Myotis californicus*), pallid bat (*Antrozous pallidus*), spotted bat (*Euderma maculatum*), Townsend's big-eared bat (*Corynorhinus townsendii*), and western pipistrelle (*Parastrellus hesperus*). Most bat species would utilize the SEZ only during foraging. Roost sites for the species (e.g., caves, hollow trees, rock crevices, or buildings) are absent to scarce on or in the affected area of the SEZ. The reduction in the boundaries and developable area of the Riverside East SEZ does not alter the potential for these species or any additional mammal species to occur in the affected area.

9.4.11.3.2 Impacts

As presented in the Draft Solar PEIS, solar energy development within the Riverside East SEZ could affect potentially suitable habitats of mammal species. The analysis presented in the Draft Solar PEIS for the Riverside East SEZ boundaries and developable area indicated that development would result in a moderate overall impact on the representative mammal species analyzed (Table 9.4.11.3-1 in the Draft Solar PEIS). The reduction in the boundaries and developable area of the Riverside East SEZ would result in reduced habitat impacts for all representative mammal species; however, resultant impact levels for all the representative mammal species would remain as moderate.

9.4.11.3.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on mammal species are described in Section A.2.2 of Appendix A of this Final Solar PEIS. With the implementation of programmatic design features, impacts on mammal species will be reduced.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, the following SEZ-specific design features have been identified:

- Within the SEZ, two north–south wildlife corridors of sufficient width (a minimum width of 1.3 mi [2 km], but wider if determined to be necessary through future site-specific studies) should be identified by the BLM in coordination with the USFWS and CDFG. These corridors should be identified as non-development areas within the SEZ on the basis of modeling data (Penrod et al. 2012) and subsequent field verification of permeability for wildlife.

- The fencing around the solar energy development should not block the free passage of mule deer between the Colorado River and mountains or foothills.

If SEZ-specific design features are implemented in addition to required programmatic design features, impacts on mammal species would be small. The need for additional SEZ-specific design features will be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

9.4.11.4 Aquatic Biota

9.4.11.4.1 Affected Environment

The boundaries of the Riverside East SEZ have been reduced compared to the boundaries given in the Draft Solar PEIS. On the basis of these changes, updates to the Draft Solar PEIS include the following:

- There are no perennial streams within the proposed Riverside East SEZ, but the intermittent McCoy Wash is present. However, it has been identified as a non-development area.

- Palen Lake (208 acres [1 km^2]) and Ford Dry Lake (3,945 acres [16 km^2]) are the only water bodies within the SEZ, but both are located within non-development areas.

- Wetlands within the SEZ have been identified as non-development areas.

- There are no natural perennial stream features within the area of indirect effects within 5 mi (8 km) of the SEZ; however, 8 mi (13 km) of the Colorado River Aqueduct is present.

- Palen Lake and Ford Dry Lake are the only water bodies present in the area of indirect effects. A total of approximately 4,053 acres (16 km^2) and 460 acres (2 km^2) of Palen Lake and Ford Dry Lake, respectively, are located within the area of potential indirect effects.

- Outside of the potential indirect effects area but within 50 mi (80 km) of the SEZ, there are 295 acres (1 km^2) of permanent lake (Salton Sea), 30,309 acres (123 km^2) of intermittent lake, and 7,985 (32 km^2) of dry lake. Dammed portions of the Colorado River are also present and total 56,215 acres (227 km^2). There are also several stream features, including 121 mi (195 km) of the Colorado River Aqueduct, 66 mi (106 km) of canals, and 189 mi (304 km) of intermittent streams.

There is no information on aquatic biota in the surface water features in the SEZ. As stated in Appendix C of the Supplement to the Draft Solar PEIS, site surveys can be conducted at the project-specific level to characterize aquatic biota, if present.

9.4.11.4.2 Impacts

The types of impacts on aquatic habitats and biota that could occur from development of utility-scale solar energy facilities are discussed in Section 5.10.3 of the Draft Solar PEIS and this Final Solar PEIS. Aquatic habitats could be affected by solar energy development in a number of ways, including (1) direct disturbance, (2) deposition of sediments, (3) changes in water quantity, and (4) degradation of water quality. The impact assessment provided in the Draft Solar PEIS remains valid, with the following updates:

- The amount of surface water features within the SEZ and in the area of indirect effects that could potentially be affected by solar energy development is less because the size of the SEZ has been reduced.

- McCoy Wash, wetlands, Palen Lake, and Ford Dry Lake have been identified as non-development areas; therefore, construction activities would not directly affect these areas. However, as described in the Draft Solar PEIS, they could be affected indirectly by solar development activities within the SEZ.

9.4.11.4.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on aquatic species are described in Section A.2.2 of Appendix A of this Final Solar PEIS. SEZ-specific resources and conditions will guide how programmatic design features are applied, for example:

- Appropriate engineering controls should be used to minimize impacts on Palen Lake, Ford Dry Lake, McCoy Wash, and their associated wetlands, including downstream occurrences, resulting from surface water runoff, erosion, sedimentation, altered hydrology, accidental spills, or fugitive dust deposition to these habitats.

- Development should avoid any additional wetlands identified during future site-specific fieldwork.

It is anticipated that the implementation of the programmatic design features will reduce impacts on aquatic biota, and if the utilization of water from groundwater or surface water sources is adequately controlled to maintain sufficient water levels in nearby aquatic habitats, the potential impacts on aquatic biota from solar energy development at the Riverside East SEZ would be small.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for aquatic biota have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

9.4.12 Special Status Species

9.4.12.1 Affected Environment

As presented in Section 9.4.12.1 of the Draft Solar PEIS, 69 special status species were identified that could occur or have potentially suitable habitat within the affected area of the proposed Riverside East SEZ. The reduction in the size of the Riverside East SEZ does not alter the potential for these species to occur in the affected area, but it may reduce the impact magnitude for some species with moderate or large impacts as determined in the Draft Solar PEIS. There were a total of 64 special status species that were determined to have moderate or large impacts in the Draft Solar PEIS that are re-evaluated here.

Since publication of the Draft Solar PEIS, the golden eagle has been identified as a special status species that could potentially occur in the affected area based on recorded occurrences and the presence of potentially suitable habitat. The golden eagle is a BLM-designated sensitive species; it is also a California fully protected species. This additional species is discussed below, along with a re-evaluation of those species determined to have moderate or large impacts in the Draft Solar PEIS. Figure 9.4.12.1-1 shows the known or potential occurrences of species in the affected area of the Riverside East SEZ that are listed, proposed, or candidates for listing under the ESA.

9.4.12.1.1 Species Listed under the Endangered Species Act That Could Occur in the Affected Area

The desert tortoise is listed as threatened under the ESA and is known to occur throughout the SEZ affected area. This species was evaluated in the Draft Solar PEIS. According to the CAReGAP and SWReGAP habitat suitability models, approximately 136,800 acres (554 km^2) of potentially suitable habitat for the desert tortoise intersects the area of direct effects in the revised area of the Riverside East SEZ (Figure 9.4.12.1-1; Table 9.4.12.1-1). Approximately 442,000 acres (1,789 km^2) of potentially suitable habitat occurs outside the SEZ within the area of indirect effects. Designated critical habitat does not occur in the affected area. Additional information provided by the USFWS since the publication of the Draft Solar PEIS indicates that the revised area of the Riverside East SEZ is situated in an area that provides habitat and genetic connectivity between areas with greater habitat suitability north and south of the SEZ (Figure 9.4.12.1-1). The USFWS determined the desert tortoise connectivity areas based upon the USGS model for desert tortoise predicted suitable habitat (Nussear et al. 2009). Furthermore, the USFWS has indicated that the desert tortoise (or its sign) has been documented within the approved and priority projects within the SEZ (Ashe 2012).

9.4.12.1.2 BLM-Designated Sensitive Species

There are 26 BLM-designated sensitive species that are discussed in this Final Solar PEIS. All but one of these species (golden eagle) were analyzed for the Riverside East SEZ in the Draft Solar PEIS. These species were determined to have large or moderate impacts resulting from solar energy development within the SEZ and are thus re-evaluated in this Final Solar PEIS. Information regarding the ecology and distribution of potentially suitable habitat for these species is presented in Table 9.4.12.1-1. There is no updated information regarding the habitat preferences, known occurrences, or potential for BLM-sensitive species evaluated in the Draft Solar PEIS to occur in the affected area of the revised area of the Riverside East SEZ (see Section 9.4.12.1.2 in the Draft Solar PEIS for a discussion of these species). Therefore, only the golden eagle is discussed below.

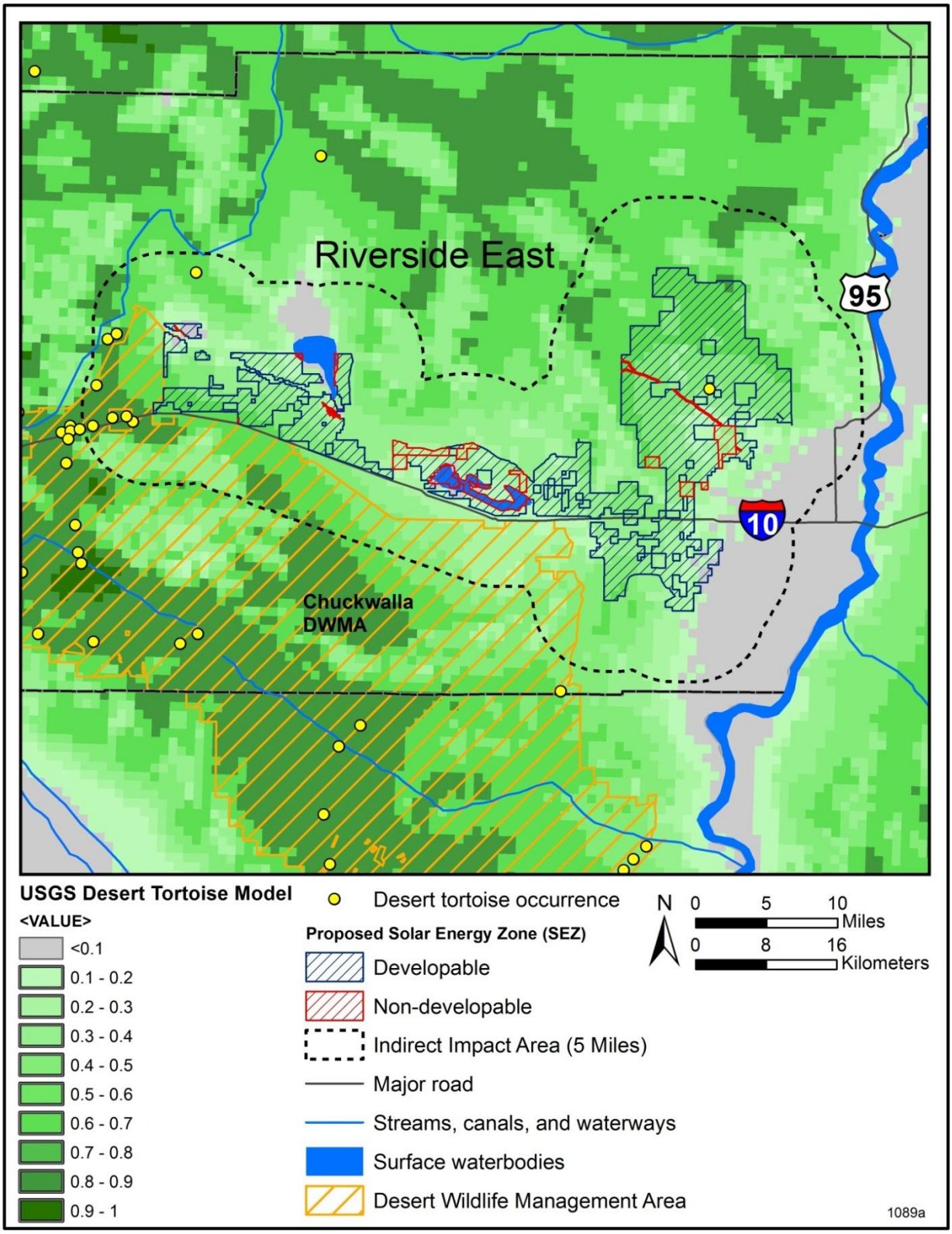

FIGURE 9.4.12.1-1 Proposed Riverside East SEZ as Revised and Distribution of Potentially Suitable Habitat for Species Listed under the Endangered Species Act (Sources: Nussear et al. 2009; CDFG 2010)

TABLE 9.4.12.1-1 Habitats, Potential Impacts, and Potential Mitigation for Special Status Species That Could Be Affected by Solar Energy Development on the Proposed Riverside East SEZ as Revised[a]

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e]	Maximum Area of Potential Habitat Affected[d]: Outside SEZ (Indirect Effects)[f]	Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
Plants						
Abrams' spurge	*Chamaesyce abramsiana*	CA-S1	Sandy substrates within creosotebush scrub communities in the Mojave and Sonoran Deserts at elevations below 3,000 ft.[i,j] Known to occur in the affected area. Nearest recorded occurrence is from the Chuckwalla DWMA, about 1 mi[k] south of the SEZ. About 2,215,155 acres[l] of potentially suitable habitat occurs within the SEZ region.	64,600 acres of potentially suitable habitat lost (2.9% of available suitable habitat)	192,700 acres of potentially suitable habitat (8.7% of available potentially suitable habitat)	Moderate overall impact. Pre-disturbance surveys and avoidance or minimization of disturbance to occupied habitats on the SEZ; translocation of individuals from areas of direct effects; or compensatory mitigation of direct effects on occupied habitats could reduce impacts. Note that these potential mitigations apply to all special status plants.
Alkali mariposa-lily	*Calochortus striatus*	BLM-S; CA-S2; FWS-SC	Alkaline seeps, springs, and meadows at elevations between 2,600 and 4,600 ft. Nearest recorded occurrences are 40 mi west of the SEZ. About 68,658 acres of potentially suitable habitat occurs within the SEZ region.	330 acres of potentially suitable habitat lost (0.5% of available suitable habitat)	880 acres of potentially suitable habitat (1.3% of available potentially suitable habitat)	Small overall impact. Avoiding or minimizing disturbance to desert playa habitat on the SEZ could reduce impacts. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.
Bitter hymenoxys	*Hymenoxys odorata*	CA-S2	Sandy substrates within riparian and Sonoran desertscrub communities, also within open flats, mesquite flats, ditches and drainage areas, and along roads and streams. Elevation ranges from 150 to 500 ft. Known to occur in the affected area. Nearest recorded occurrences are 5 mi east of the SEZ. About 2,657,966 acres of potentially suitable habitat occurs within the SEZ region.	80,800 acres of potentially suitable habitat lost (3.0% of available suitable habitat)	286,300 acres of potentially suitable habitat (10.8% of available potentially suitable habitat)	Moderate overall impact. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.

TABLE 9.4.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Plants (Cont.)						
California ditaxis	*Ditaxis serrata* var. *californica*	CA-S2	Sonoran desertscrub and creosotebush scrub communities at elevations between 100 and 3,300 ft. Known to occur in the affected area. Nearest recorded occurrence is near the Colorado River Aqueduct, approximately 2 mi west of the SEZ. About 2,514,766 acres of potentially suitable habitat occurs within the SEZ region.	65,350 acres of potentially suitable habitat lost (2.6% of available suitable habitat)	195,000 acres of potentially suitable habitat (7.7% of available potentially suitable habitat)	Moderate overall impact. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.
California satintail	*Imperata brevifolia*	CA-S2	Chaparral, coastal sage scrub, creosotebush, desertscrub, mesic riparian scrub, and alkaline meadow and seep communities. Elevation ranges from 0 to 1,650 ft. Known to occur in the affected area. Nearest recorded occurrences are 5 mi east of the SEZ. About 2,526,349 acres of potentially suitable habitat occurs within the SEZ region.	65,350 acres of potentially suitable habitat lost (2.6% of available suitable habitat)	195,000 acres of potentially suitable habitat (7.7% of available potentially suitable habitat)	Moderate overall impact. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.

TABLE 9.4.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Plants (Cont.)						
California saw-grass	*Cladium californicum*	CA-S2	Alkaline, freshwater, and riparian habitats including meadows, marshes, swamps, and seeps. Elevation ranges from 200 to 2,000 ft. Nearest recorded occurrence is from the vicinity of the Salton Sea, approximately 30 mi southwest of the SEZ. About 117,240 acres of potentially suitable habitat occurs within the SEZ region.	330 acres of potentially suitable habitat lost (0.3% of available suitable habitat)	1,250 acres of potentially suitable habitat (1.1% of available potentially suitable habitat)	Small overall impact. Avoiding or minimizing disturbance to desert playa and wash habitats on the SEZ could reduce impacts. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.
Chaparral sand-verbena	*Abronia villosa* var. *aurita*	BLM-S; CA-S2	Endemic to southern California. Inhabits chaparral desert sand dunes at elevations between 350 and 5,250 ft. Historically occurred on and in the vicinity of the SEZ; the species has not been recorded in the project area since 1964. Most recent recorded occurrences are 23 mi from the SEZ. About 84,357 acres of potentially suitable habitat occurs within the SEZ region.	13,300 acres of potentially suitable habitat lost (15.8% of available suitable habitat)	24,300 acres of potentially suitable habitat (28.8% of available potentially suitable habitat)	Large overall impact. Avoiding or minimizing disturbance to desert dunes and sand transport systems on the SEZ could reduce impacts. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.

TABLE 9.4.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Plants (Cont.)						
Coves' cassia	*Senna covesii*	CA-S2	Sonoran Desert dry washes and slopes with sandy substrates within desertscrub and creosotebush scrub communities. Elevation ranges from 1,000 to 3,500 ft. Nearest recorded occurrence is 15 mi from the SEZ. About 3,164,051 acres of potentially suitable habitat occurs within the SEZ region.	80,800 acres of potentially suitable habitat lost (2.6% of available suitable habitat)	277,800 acres of potentially suitable habitat (8.8% of available potentially suitable habitat)	Moderate overall impact. Avoiding or minimizing disturbance to desert wash habitats on the SEZ could reduce impacts. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.
Creamy blazing star	*Mentzelia tridentata*	BLM-S; CA-S2	Mojave desert creosotebush scrub communities on rocky and sandy substrates at elevations below 3,900 ft. Nearest recorded occurrences are 45 mi west of the SEZ. About 2,215,155 acres of potentially suitable habitat occurs within the SEZ region.	64,500 acres of potentially suitable habitat lost (2.9% of available suitable habitat)	192,700 acres of potentially suitable habitat (8.7% of available potentially suitable habitat)	Moderate overall impact. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.
Desert pincushion	*Coryphantha chlorantha*	CA-S1	Gravelly bajadas, limestone, or dolomite rocky slopes associated with desert scrub communities within pinyon-juniper woodlands and Joshua tree woodlands. Elevation ranges from 148 to 7,875 ft. Nearest recorded occurrence is 30 mi from the SEZ. About 2,526,161 acres of potentially suitable habitat occurs within the SEZ region.	65,300 acres of potentially suitable habitat lost (2.6% of available suitable habitat)	195,200 acres of potentially suitable habitat (7.7% of available potentially suitable habitat)	Moderate overall impact. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.

TABLE 9.4.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Plants (Cont.)						
Desert spike-moss	*Selaginella eremophila*	CA-S2	Gravelly or rocky slopes within creosotebush scrub and Sonoran desertscrub communities. Elevation ranges from 650 to 2,950 ft. Known to occur in the affected area. Nearest recorded occurrence is 5 mi south of the SEZ. About 2,514,766 acres of potentially suitable habitat occurs within the SEZ region.	65,300 acres of potentially suitable habitat lost (2.6% of available suitable habitat)	195,100 acres of potentially suitable habitat (7.8% of available potentially suitable habitat)	Moderate overall impact. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.
Dwarf germander	*Teucrium cubense* ssp. *depressum*	CA-S2	Desert dunes, playas, riparian, creosotebush scrub, and desertscrub communities. Elevation ranges from 150 to 1,300 ft. Known to occur in the affected area. Nearest recorded occurrence is from the Chuckwalla DWMA, about 1 mi south of the SEZ. About 2,727,570 acres of potentially suitable habitat occurs within the SEZ region.	79,000 acres of potentially suitable habitat lost (2.9% of available suitable habitat)	221,000 acres of potentially suitable habitat (8.1% of available potentially suitable habitat)	Moderate overall impact. Avoiding or minimizing disturbance to playas and desert dunes and sand transport systems could reduce impacts. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.

TABLE 9.4.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Plants (Cont.)						
Emory's crucifixion-thorn	*Castela emoryi*	CA-S2	Slightly wet alluvial bottomlands associated with basalt flows within Mojave desertscrub, nonsaline playas, creosotebush scrub, and Sonoran desertscrub communities. Elevation ranges from 295 to 2,200 ft. Known to occur in the affected area. Nearest recorded occurrence is about 1 mi from the western portion of the SEZ. About 2,594,668 acres of potentially suitable habitat occurs within the SEZ region.	65,700 acres of potentially suitable habitat lost (2.5% of available suitable habitat)	196,000 acres of potentially suitable habitat (7.6% of available potentially suitable habitat)	Moderate overall impact. Avoiding or minimizing disturbance to playas could reduce impacts. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.
Giant spanish-needle	*Palafoxia arida* var. *gigantea*	BLM-S; CA-S1	Desert sand dune habitats at elevations below 330 ft. Nearest recorded occurrences are 40 mi south of the SEZ. Suitable habitat may exist on the site. About 84,168 acres of potentially suitable habitat occurs within the SEZ region.	13,300 acres of potentially suitable habitat lost (15.8% of available suitable habitat)	24,300 acres of potentially suitable habitat (28.9% of available potentially suitable habitat)	Large overall impact. Avoiding or minimizing disturbance to desert dunes and sand transport systems on the SEZ could reduce impacts. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.
Glandular ditaxis	*Ditaxis claryana*	CA-S1	Sandy substrates within desertscrub communities at elevations below 1,525 ft. Known to occur in the affected area. Nearest recorded occurrence is from the Chuckwalla DWMA, approximately 2 mi south of the SEZ. About 2,526,160 acres of potentially suitable habitat occurs within the SEZ region.	65,300 acres of potentially suitable habitat lost (2.6% of available suitable habitat)	195,200 acres of potentially suitable habitat (7.7% of available potentially suitable habitat)	Moderate overall impact. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.

TABLE 9.4.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Plants (Cont.)						
Harwood's eriastrum	*Eriastrum harwoodii*	BLM-S; CA-S2	Known from fewer than 20 occurrences in southern California on desert dunes and other sandy habitats at elevations between 650 and 3,000 ft. Nearest recorded occurrence is 15 mi northwest of the SEZ in the Pinto Mountains DWMA. About 84,168 acres of potentially suitable habitat occurs within the SEZ region.	13,300 acres of potentially suitable habitat lost (15.8% of available suitable habitat)	24,300 acres of potentially suitable habitat (28.9% of available potentially suitable habitat)	Large overall impact. Avoiding or minimizing disturbance to dunes and sand transport systems could reduce impacts. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.
Harwood's milkvetch	*Astragalus insularis* var. *harwoodii*	CA-S2	Sonoran Desert of Arizona and California on sandy or gravelly substrates of desert dunes within desert scrub communities. Elevation ranges from 0 to 2,325 ft. Known to occur on the SEZ and in other portions of the affected area. About 2,610,178 acres of potentially suitable habitat occurs within the SEZ region.	78,600 acres of potentially suitable habitat lost (3.0% of available suitable habitat)	219,500 acres of potentially suitable habitat (8.4% of available potentially suitable habitat)	Moderate overall impact. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.
Jackass-clover	*Wislizenia refracta* ssp. *refracta*	CA-S1	Mojave and northern Sonoran Deserts in dunes, sandy washes, roadsides, and playas within creosotebush scrub, alkali sink, or desertscrub communities. Elevation ranges from 2,000 to 2,600 ft. Known to occur in wash habitats in the western portion of the SEZ near Palen Lake. About 813,288 acres of potentially suitable habitat occurs within the SEZ region.	29,000 acres of potentially suitable habitat lost (3.6% of available suitable habitat)	107,800 acres of potentially suitable habitat (13.3% of available potentially suitable habitat)	Moderate overall impact. Avoiding or minimizing disturbance to dunes and sand transport systems, playas, or washes could reduce impacts. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.

TABLE 9.4.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Plants (Cont.)						
Latimer's woodland-gilia	*Saltugilia latimeri*	BLM-S; CA-S2	Mojave desertscrub communities, pinyon-juniper woodlands, and washes on rocky or sandy substrates at elevations between 1,300 and 6,500 ft. Nearest recorded occurrence is 30 mi west of the SEZ. About 2,920,277 acres of potentially suitable habitat occurs within the SEZ region.	80,800 acres of potentially suitable habitat lost (2.8% of available suitable habitat)	277,800 acres of potentially suitable habitat (9.5% of available potentially suitable habitat)	Moderate overall impact. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.
Little San Bernardino Mountains linanthus	*Linanthus maculatus*	BLM-S; CA-S1	Known from fewer than 20 occurrences in southern California near Joshua Tree NP in desert dunes and sandy flats with creosotebush scrub and Joshua tree woodland communities at elevations below 6,900 ft. Nearest recorded occurrences are 30 mi west of the SEZ. About 84,168 acres of potentially suitable habitat occurs within the SEZ region.	13,300 acres of potentially suitable habitat lost (15.8% of available suitable habitat)	24,300 acres of potentially suitable habitat (28.9% of available potentially suitable habitat)	Large overall impact. Avoiding or minimizing disturbance to dunes and sand transport systems on the SEZ could reduce impacts. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.

TABLE 9.4.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Plants (Cont.)						
Lobed ground-cherry	*Physalis lobata*	CA-S1	Known from the northeastern Sonoran and southeastern Mojave Deserts in decomposed granitic substrates within creosotebush scrub, alkali sink, desertscrub, and playas communities. Elevation ranges from 1,650 to 2,600 ft. Nearest recorded occurrences are 20 mi northwest of the SEZ. About 2,594,668 acres of potentially suitable habitat occurs within the SEZ region.	65,600 acres of potentially suitable habitat lost (2.5% of available suitable habitat)	196,000 acres of potentially suitable habitat (7.6% of available potentially suitable habitat)	Moderate overall impact. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.
Munz's cholla	*Opuntia munzii*	BLM-S; CA-S1	Gravelly or sandy to rocky soils, often on lower bajadas, washes, flats, hills and canyon sides in Sonoran Desert creosotebush shrub communities at elevations below 3,280 ft. Nearest recorded occurrences are from the Chuckwalla DWMA, approximately 20 mi south of the SEZ. About 4,187,934 acres of potentially suitable habitat occurs within the SEZ region.	103,300 acres of potentially suitable habitat lost (2.5% of available suitable habitat)	495,500 acres of potentially suitable habitat (11.8% of available potentially suitable habitat)	Moderate overall impact. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.

TABLE 9.4.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Plants (Cont.)						
Narrow-leaved psorothamnus	*Psorothamnus fremontii* var. *attenuatus*	CA-S2	Volcanic substrates of slopes, flats, and canyons within Sonoran desertscrub communities at elevations between 1,100 and 3,000 ft. Nearest recorded occurrences are from the vicinity of the Whipple Mountains, approximately 32 mi northeast of the SEZ. About 2,863,434 acres of potentially suitable habitat occurs within the SEZ region.	84,600 acres of potentially suitable habitat lost (3.0% of available suitable habitat)	326,500 acres of potentially suitable habitat (11.4% of available potentially suitable habitat)	Moderate overall impact. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.
Orocopia sage	*Salvia greatae*	BLM-S; CA-S2	Creosotebush scrub communities and dry washes at elevations below 2,600 ft. Known to occur in the affected area. Nearest occurrences are from the Chuckwalla DWMA about 2 mi south of the SEZ. About 2,853,196 acres of potentially suitable habitat occurs within the SEZ region.	97,900 acres of potentially suitable habitat lost (3.4% of available suitable habitat)	257,500 acres of potentially suitable habitat (9.0% of available potentially suitable habitat)	Moderate overall impact. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.
Parish's club-cholla	*Grusonia parishii*	CA-S2	Silty, sandy, or gravelly flats, dunelets, and hills within Joshua tree woodlands, creosotebush scrub, and desertscrub communities. Elevation ranges from 100 to 5,000 ft. Nearest recorded occurrences are 10 mi west of the SEZ. About 2,995,669 acres of potentially suitable habitat occurs within the SEZ region.	97,900 acres of potentially suitable habitat lost (5.7% of available suitable habitat)	359,000 acres of potentially suitable habitat (12.0% of available potentially suitable habitat)	Moderate overall impact. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.

TABLE 9.4.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Plants (Cont.)						
Pink fairy-duster	*Calliandra eriophylla*	CA-S2	Sandy or rocky substrates in creosote and desertscrub communities. Elevation ranges between 390 and 4,900 ft. Known to occur in the affected area. The species is known to occur in habitats along I-10 about 0.5 mi south of the SEZ. About 2,526,160 acres of potentially suitable habitat occurs within the SEZ region.	65,300 acres of potentially suitable habitat lost (2.6% of available suitable habitat)	195,200 acres of potentially suitable habitat (7.7% of available potentially suitable habitat)	Moderate overall impact. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.
Purple-nerve cymopterus	*Cymopterus multinervatus*	CA-S2	Sandy or gravelly slopes within desertscrub, Joshua tree woodland, and pinyon-juniper woodland communities. Elevation ranges from 2,600 to 5,900 ft. Nearest recorded occurrences are from San Bernardino County, California, approximately 40 mi northwest of the SEZ. About 2,526,160 acres of potentially suitable habitat occurs within the SEZ region.	65,300 acres of potentially suitable habitat lost (4.4% of available suitable habitat)	195,200 acres of potentially suitable habitat (7.7% of available potentially suitable habitat)	Moderate overall impact. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.

TABLE 9.4.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Plants (Cont.)						
Saguaro cactus	*Carnegiea gigantea*	CA-S1	Endemic to the Sonoran Desert along the Colorado River from the Whipple Mountains to Laguna Dam. Rocky substrates within Sonoran desertscrub and creosotescrub communities at elevations between 160 and 4,900 ft. Nearest recorded occurrence is from the Palo Verde Mountains WA, approximately 10 mi south of the SEZ. About 2,863,434 acres of potentially suitable habitat occurs within the SEZ region.	84,600 acres of potentially suitable habitat lost (3.0% of available suitable habitat)	326,500 acres of potentially suitable habitat (11.4% of available potentially suitable habitat)	Moderate overall impact. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.
Salt Spring checkerbloom	*Sidalcea neomexicana*	CA-S2	Alkaline or mesic substrates within riparian wetlands, marshes, springs, chaparral, coastal scrub, coniferous forest, desertscrub, and playas habitats. Elevation ranges from 50 to 5,000 ft. Nearest recorded occurrences are approximately 40 mi northwest of the SEZ. About 2,643,589 acres of potentially suitable habitat occurs within the SEZ region.	65,700 acres of potentially suitable habitat lost (2.5% of available suitable habitat)	196,500 acres of potentially suitable habitat (7.4% of available potentially suitable habitat)	Moderate overall impact. Avoiding or minimizing disturbance to desert playa and wash habitats on the SEZ could reduce impacts. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.

TABLE 9.4.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Plants (Cont.)						
Sand evening-primrose	*Camissonia arenaria*	CA-S2	Sandy washes and rocky slopes within Sonoran desertscrub communities at elevations below 3,000 ft. Nearest recorded occurrence is 13 mi south of the SEZ in the Chuckwalla DWMA. About 3,501,475 acres of potentially suitable habitat occurs within the SEZ region.	100,100 acres of potentially suitable habitat lost (2.9% of available suitable habitat)	409,000 acres of potentially suitable habitat (11.7% of available potentially suitable habitat)	Moderate overall impact. Avoiding or minimizing disturbance to desert wash habitats on the SEZ could reduce impacts. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.
Slender cottonheads	*Nemacaulis denudata* var. *gracilis*	CA-S2	Southern California within the Mojave and Sonoran Deserts on sandy soils within coastal dunes, desert dunes, creosotebush scrub, and desertscrub communities at elevations below 1,300 ft. Nearest recorded occurrences are 40 mi west of the SEZ. About 1,786,349 acres of potentially suitable habitat occurs within the SEZ region.	78,600 acres of potentially suitable habitat lost (4.4% of available suitable habitat)	219,500 acres of potentially suitable habitat (12.3% of available potentially suitable habitat)	Moderate overall impact. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.
Small-flowered androstephium	*Androstephium breviflorum*	CA-S1	Dry sandy to rocky soil substrates in desert dunes within creosotebush scrub and Mojavean desertscrub at elevations between 720 and 2,100 ft. Nearest occurrences are approximately 10 mi north of the SEZ. About 2,715,222 acres of potentially suitable habitat occurs within the SEZ region.	98,000 acres of potentially suitable habitat lost (3.6% of available suitable habitat)	351,000 acres of potentially suitable habitat (12.9% of available potentially suitable habitat)	Moderate overall impact. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.

TABLE 9.4.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Plants (Cont.)						
Spear-leaf matelea	*Matelea parvifolia*	CA-S2	Endemic to southeastern California on rocky substrates within creosotebush and desertscrub communities at elevations between 1,450 and 3,600 ft. Known to occur in the affected area. Nearest recorded occurrences are 5 mi south of the SEZ in the Chuckwalla DWMA. About 2,526,160 acres of potentially suitable habitat occurs within the SEZ region.	65,300 acres of potentially suitable habitat lost (2.6% of available suitable habitat)	195,200 acres of potentially suitable habitat (7.7% of available potentially suitable habitat)	Moderate overall impact. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.
Thorny milkwort	*Polygala acanthoclada*	CA-S2	Loose, sandy or gravelly slopes within shadscale scrub, chenopod scrub, Joshua tree woodland, and pinyon-juniper woodland communities at elevations between 2,500 and 7,500 ft. Nearest recorded occurrences are 25 mi west of the SEZ. About 2,526,161 acres of potentially suitable habitat occurs within the SEZ region.	65,300 acres of potentially suitable habitat lost (2.6% of available suitable habitat)	195,200 acres of potentially suitable habitat (7.7% of available potentially suitable habitat)	Moderate overall impact. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.
Three-awned grama	*Bouteloua trifida*	CA-S2	Eastern Mojave Desert mountains on dry, rocky, often calcareous slopes within desertscrub communities. Elevation ranges between 2,300 and 6,500 ft. Nearest recorded occurrence is 40 mi north of the SEZ. About 2,282,236 acres of potentially suitable habitat occurs within the SEZ region.	65,300 acres of potentially suitable habitat lost (2.9% of available suitable habitat)	195,200 acres of potentially suitable habitat (8.6% of available potentially suitable habitat)	Moderate overall impact. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.

TABLE 9.4.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d] Within SEZ (Direct Effects)[e]	Maximum Area of Potential Habitat Affected[d] Outside SEZ (Indirect Effects)[f]	Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
Plants (Cont.)						
White-margined beardtongue	*Penstemon albomarginatus*	BLM-S; CA-S1; FWS-SC	Desert sand dune habitats and Mojave desertscrub communities at elevations below 3,600 ft. Nearest recorded occurrences are 50 mi north of the SEZ. About 2,366,404 acres of potentially suitable habitat occurs within the SEZ region.	78,600 acres of potentially suitable habitat lost (3.3% of available suitable habitat)	219,500 acres of potentially suitable habitat (9.3% of available potentially suitable habitat)	Moderate overall impact. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.
Wiggins' cholla	*Opuntia wigginsii*	CA-S1	Sandy substrates of small washes and flats within creosotebush scrub and Sonoran desertscrub communities. Elevation ranges from 100 to 2,900 ft. Known to occur in the affected area. Nearest recorded occurrences are approximately 5 mi south of the SEZ. About 2,909,226 acres of potentially suitable habitat occurs within the SEZ region.	80,800 acres of potentially suitable habitat lost (2.8% of available suitable habitat)	277,700 acres of potentially suitable habitat (9.5% of available potentially suitable habitat)	Moderate overall impact. See Abrams' spurge for a list of potential mitigations applicable to all special status plant species.
Arthropods						
Bradley's cuckoo wasp	*Ceratochrysis bradleyi*	CA-S1	Endemic to California where it is known only from eastern Riverside County in Sonoran desertscrub, creosote-scrub, yucca and cholla cactus, saltbush, and desert dune communities. Known to occur in the affected area. Nearest recorded occurrence is 2 mi east of the SEZ. About 2,610,178 acres of potentially suitable habitat occurs within the SEZ region.	13,300 acres of potentially suitable habitat lost (0.5% of available suitable habitat)	28,400 acres of potentially suitable habitat (1.1% of available potentially suitable habitat)	Small overall impact. Pre-disturbance surveys and avoidance or minimization of disturbance to occupied habitats on the SEZ or compensatory mitigation of direct effects on occupied habitats could reduce impacts.

TABLE 9.4.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Arthropods (Cont.)						
Cheeseweed owlfly	*Oliarces clara*	CA-S1; FWS-SC	Colorado River drainage of southwestern Arizona and southern California within creosote-scrub communities on or near bajadas at elevations below 330 ft. Nearest recorded occurrence is 10 mi north of the SEZ. About 2,215,155 acres of potentially suitable habitat occurs within the SEZ region.	64,500 acres of potentially suitable habitat lost (2.9% of available suitable habitat)	192,700 acres of potentially suitable habitat (8.7% of available potentially suitable habitat)	Moderate overall impact. Pre-disturbance surveys and avoidance or minimization of disturbance to occupied habitats on the SEZ or compensatory mitigation of direct effects on occupied habitats could reduce impacts.
Riverside cuckoo wasp[m]	***Hedychridium argenteum***	CA-S1	Endemic to California where it is known only from eastern Riverside County in Sonoran desertscrub, creosotebush scrub, yucca and cholla cactus, saltbush, and desert dune communities. The only known CNDDB occurrence for this species is within the SEZ near the southern border of the SEZ. About 2,610,178 acres of potentially suitable habitat occurs within the SEZ region.	78,600 acres of potentially suitable habitat lost (3.0% of available suitable habitat)	219,500 acres of potentially suitable habitat (8.4% of available potentially suitable habitat)	Moderate overall impact. Pre-disturbance surveys and avoidance or minimization of disturbance to occupied habitats on the SEZ or compensatory mitigation of direct effects on occupied habitats could reduce impacts.
Roberts' rhopalolemma bee	*Rhopalolemma robertsi*	CA-S1	Endemic to southern California from desert wash habitats in southern San Bernardino County. Nearest recorded occurrences are 35 mi west of the SEZ. About 637,257 acres of potentially suitable habitat occurs within the SEZ region.	15,500 acres of potentially suitable habitat lost (2.4% of available suitable habitat)	82,500 acres of potentially suitable habitat (13.0% of available potentially suitable habitat)	Moderate overall impact. Pre-disturbance surveys and avoidance or minimization of disturbance to occupied habitats on the SEZ or compensatory mitigation of direct effects on occupied habitats could reduce impacts.

TABLE 9.4.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Amphibians						
Couch's spadefoot	*Scaphiopus couchii*	CA-S2; CA-SC	Scattered populations east of the Algodones Mountains north along the Colorado River in wetland habitats that include temporary pools, ponds, and puddles. Often occurs in arid and semiarid shrublands, shortgrass plains, mesquite savanna, creosotebush, thorn forest, and cultivated areas. Elevation ranges from 690 to 1,120 ft. Nearest recorded occurrences are 6 mi southeast of the SEZ. About 424,690 acres of potentially suitable habitat occurs within the SEZ region.	18,500 acres of potentially suitable habitat lost (4.3% of available suitable habitat)	63,000 acres of potentially suitable habitat (14.9% of available potentially suitable habitat)	Moderate overall impact. Pre-disturbance surveys and avoidance or minimization of disturbance to occupied habitats on the SEZ or compensatory mitigation of direct effects on occupied habitats could reduce impacts.
Reptiles						
Desert tortoise	***Gopherus agassizii***	ESA-T; CA-T; CA-S2	Mojave and Sonoran Deserts in desert creosotebush communities on firm soils for digging burrows, along riverbanks, washes, canyon bottoms, creosote flats, and desert oases. Known to occur on the SEZ (western and northeastern portions) and in the affected area. About 4,205,025 acres of potentially suitable habitat occurs within the SEZ region.	136,800 acres of potentially suitable habitat lost (3.3% of available suitable habitat)	442,000 acres of potentially suitable habitat (10.5% of available potentially suitable habitat)	Moderate overall impact. Pre-disturbance surveys and avoidance or minimization of disturbance to occupied habitats on the SEZ, translocation of individuals from areas of direct effects, or compensatory mitigation of direct effects on occupied habitats could reduce impacts. The potential for impact and need for mitigation should be determined in consultation with the USFWS and CDFG.

TABLE 9.4.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Reptiles (Cont.)						
Mojave fringe-toed lizard	*Uma scoparia*	BLM-S; CA-SC	Sandy habitats in the Mojave Desert from Death Valley south to the Colorado River near Blythe, California, and extreme western Arizona. Sparsely vegetated desert areas with fine windblown sand, including dunes, flats, and washes at elevations below 3,000 ft. Nearest recorded occurrences are 25 mi north of the SEZ. About 1,840,628 acres of potentially suitable habitat occurs within the SEZ region.	108,700 acres of potentially suitable habitat lost (5.9% of available suitable habitat)	415,000 acres of potentially suitable habitat (22.6% of available potentially suitable habitat)	Moderate overall impact. Avoiding or minimizing disturbance of desert dunes and sand transport systems or washes could reduce impacts. In addition, pre-disturbance surveys and avoidance or minimization of disturbance to occupied habitats on the SEZ or compensatory mitigation of direct effects could reduce impacts.
Rosy boa	*Charina trivirgata*	BLM-S; FWS-SC	Southeastern California and western Arizona in scrublands, rocky deserts, and canyons with permanent or intermittent streams. Nearest recorded occurrences are from Joshua Tree NP, approximately 25 mi west of the SEZ. About 4,171,153 acres of potentially suitable habitat occurs within the SEZ region.	136,900 acres of potentially suitable habitat lost (3.3% of available suitable habitat)	443,300 acres of potentially suitable habitat (10.6% of available potentially suitable habitat)	Moderate overall impact. Pre-disturbance surveys and avoidance or minimization of disturbance to occupied habitats on the SEZ, translocation of individuals from areas of direct effects, or compensatory mitigation of direct effects on occupied habitats could reduce impacts.

TABLE 9.4.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Birds						
Bendire's thrasher	***Toxostoma bendirei***	BLM-S; CA-SC	Summer resident in the SEZ region in a variety of desert habitats with fairly large shrubs or cacti and open ground, or open woodland with scattered shrubs and trees, between 0 and 550 m elevation. Nearest recorded occurrence is 2 mi south of the SEZ in the Chuckwalla DWMA. About 2,526,161 acres of potentially suitable habitat occurs within the SEZ region.	65,300 acres of potentially suitable habitat lost (2.6% of available suitable habitat)	195,000 acres of potentially suitable habitat (7.7% of available potentially suitable habitat)	Moderate overall impact. Pre-disturbance surveys and avoidance or minimization of disturbance to occupied habitats, especially nesting habitats on the SEZ, or compensatory mitigation of direct effects on occupied habitats could reduce impacts.
Ferruginous hawk	*Buteo regalis*	BLM-S; FWS-SC	Winter resident and migrant in the SEZ region at lower elevations in open grasslands, shrublands, sagebrush flats, desertscrub, desert valleys, and fringes of pinyon-juniper habitats. Occurs in Riverside County, California, in the SEZ region. About 1,978,858 acres of potentially suitable habitat occurs within the SEZ region.	65,300 acres of potentially suitable foraging habitat lost (3.3% of available suitable habitat)	244,600 acres of potentially suitable habitat (12.4% of available potentially suitable habitat)	Moderate overall impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible, because suitable foraging habitat is widespread in the area of direct effects.
Golden eagle	*Aquila chrysaetos*	BLM-S; CA-FP	An uncommon to common permanent resident and migrant in southern California. Habitat includes rolling foothills, mountain areas, and desert shrublands. Nests on cliff faces and in large trees in open areas. About 3,104,000 acres of potentially suitable habitat occurs within the SEZ region.	65,300 acres of potentially suitable foraging habitat lost (2.1% of available suitable habitat)	244,600 acres of potentially suitable habitat (7.9% of available potentially suitable habitat)	Moderate overall impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible, because suitable foraging habitat is widespread in the area of direct effects.

TABLE 9.4.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Birds (Cont.)						
Hepatic tanager	*Piranga flava*	CA-S1	Summer resident in SEZ region in open coniferous forests, montane pine-oak forests, riparian woodlands, and pine savanna. Nests high in coniferous or deciduous trees. Nearest recorded occurrences are 17 mi from the SEZ. About 3,283 acres of potentially suitable habitat occurs within the SEZ region.	0 acres	228 acres of potentially suitable habitat (6.9% of available potentially suitable habitat)	Small overall impact. No direct effects. Only indirect effects are possible.
Loggerhead shrike	*Lanius ludovicianus*	CA-SC; FWS-SC	Breeds in SEZ region in open woodlands with moderate grass cover interspersed with areas of bare ground. Nearest recorded occurrences are approximately 10 mi south of the SEZ. About 3,635,415 acres of potentially suitable habitat occurs within the SEZ region.	147,000 acres of potentially suitable habitat lost (4.1% of available suitable habitat)	457,200 acres of potentially suitable habitat (12.6% of available potentially suitable habitat)	Moderate overall impact. Avoiding or minimizing disturbance of all woodland habitat on the SEZ would reduce or eliminate impacts. Alternatively, pre-disturbance surveys and avoidance or minimization of disturbance to occupied habitats, especially nesting habitats on the SEZ, or compensatory mitigation of direct effects on occupied habitats could reduce impacts.

TABLE 9.4.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Birds (Cont.)						
Western burrowing owl	*Athene cunicularia hypugaea*	BLM-S; CA-S2; CA-SC; FWS-SC	Year-round resident in the SEZ region. Open areas with short, sparse vegetation, including grasslands, agricultural fields, and disturbed areas. Nests in burrows created by mammals or tortoises. Known to occur in the affected area. Nearest occurrences are within 1 mi east of the SEZ. About 4,653,092 acres of potentially suitable habitat occurs within the SEZ region.	147,000 acres of potentially suitable habitat lost (3.2% of available suitable habitat)	553,500 acres of potentially suitable habitat (11.9% of available potentially suitable habitat)	Moderate overall impact. Pre-disturbance surveys and avoidance or minimization of disturbance to occupied burrows and habitats in the area of direct effects or compensatory mitigation of direct effects on occupied habitats could reduce impacts.
Mammals						
Arizona myotis	*Myotis occultus*	CA-S2; CA-SC; FWS-SC	Ponderosa pine and oak-pine woodlands in close proximity to water, and riparian forests within along the Colorado River. Known to occur in the affected area. Nearest recorded occurrences are 4 mi east of the SEZ. About 802,324 acres of potentially suitable habitat occurs within the SEZ region.	15,500 acres of potentially suitable habitat lost (1.9% of available suitable habitat)	83,000 acres of potentially suitable habitat (10.3% of available potentially suitable habitat)	Moderate overall impact on mostly foraging habitat. Pre-disturbance surveys and avoidance or minimization of disturbance to discovered roost areas on the SEZ could reduce impacts.

TABLE 9.4.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Mammals (Cont.)						
California leaf-nosed bat	*Macrotus californicus*	BLM-S; CA-S2; CA-SC; FWS-SC	Year-round resident in SEZ region in desert riparian, desert wash, desertscrub, and palm oasis habitats at elevations below 2,000 ft. Roosts in mines, caves, and buildings. Known to occur in the affected area. Nearest recorded occurrences are from the Palen-McCoy Wilderness within 2 mi of the SEZ. About 3,973,317 acres of potentially suitable habitat occurs within the SEZ region.	84,800 acres of potentially suitable habitat lost (2.1% of available suitable habitat)	358,700 acres of potentially suitable habitat (9.0% of available potentially suitable habitat)	Moderate overall impact on mostly foraging habitat. Pre-disturbance surveys and avoidance or minimization of disturbance to discovered roost areas on the SEZ could reduce impacts.
Cave myotis	*Myotis velifer*	BLM-S; CA-S1; CA-SC; FWS-SC	Year-round resident in SEZ region in desertscrub, shrublands, washes, and riparian habitats. Roosts in colonies in caves. Known to occur in the affected area. Nearest recorded occurrence is from the Mule Mountains ACEC about 2 mi south of the SEZ. About 4,136,719 acres of potentially suitable habitat occurs within the SEZ region.	84,800 acres of potentially suitable habitat lost (2.0% of available suitable habitat)	359,000 acres of potentially suitable habitat (8.7% of available potentially suitable habitat)	Moderate overall impact on mostly foraging habitat. Pre-disturbance surveys and avoidance or minimization of disturbance to discovered roost areas on the SEZ could reduce impacts.

TABLE 9.4.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d] Within SEZ (Direct Effects)[e]	Maximum Area of Potential Habitat Affected[d] Outside SEZ (Indirect Effects)[f]	Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
Mammals (Cont.)						
Colorado Valley woodrat	*Neotoma albigula venusta*	CA-S1	Low-lying desert, creosote-mesquite, and pinyon-juniper habitats. Distribution is strongly influenced by the availability of den-building materials, including litter of cholla, prickly pear, mesquite, and catclaw, as well as its low tolerance for cold temperatures. Known to occur in the affected area. Nearest recorded occurrences are on BLM lands about 1 mi southeast of the SEZ. About 3,066,791 acres of potentially suitable habitat occurs within the SEZ region.	144,800 acres of potentially suitable habitat lost (4.7% of available suitable habitat)	423,400 acres of potentially suitable habitat (13.8% of available potentially suitable habitat)	Moderate overall impact. Pre-disturbance surveys and avoidance or minimization of disturbance to occupied habitats on the SEZ or compensatory mitigation of direct effects on occupied habitats could reduce impacts.
Nelson's bighorn sheep	*Ovis canadensis nelsoni*	BLM-S; FWS-SC	Open, steep rocky terrain in mountainous habitats of the eastern Mojave and Sonoran Deserts in California. Rarely uses desert lowlands, except as corridors for travel between mountain ranges. Known to occur in the affected area. Nearest recorded occurrences are from the Joshua Tree Wilderness and the Chuckwalla DWMA, about 2 mi north, west, and south of the SEZ. About 1,896,141 acres of potentially suitable habitat occurs within the SEZ region.	10,500 acres of potentially suitable habitat lost (0.6% of available suitable habitat)	121,000 acres of potentially suitable habitat (6.4% of available potentially suitable habitat)	Small overall impact. Pre-disturbance surveys and avoidance or minimization of disturbance to occupied habitats within the SEZ other habitats that serve as movement corridors could further reduce impacts.

TABLE 9.4.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Mammals (Cont.)						
Pallid bat	*Antrozous pallidus*	BLM-S; CA-SC; FWS-SC	Year-round resident in SEZ region in low-elevation desert communities, including grasslands, shrublands, and woodlands. Roosts in caves, crevices, and mines. Known to occur in the affected area. Nearest recorded occurrence is from the Chuckwalla Mountains Wilderness approximately 5 mi south of the SEZ. About 3,668,119 acres of potentially suitable habitat occurs within the SEZ region.	69,300 acres of potentially suitable habitat lost (1.9% of available suitable habitat)	276,000 acres of potentially suitable habitat (7.5% of available potentially suitable habitat)	Moderate overall impact on mostly foraging habitat. Pre-disturbance surveys and avoidance or minimization of disturbance to discovered roost areas on the SEZ could reduce impacts.
Palm Springs pocket mouse	*Perognathus longimembris bangsi*	BLM-S; CA-S2; CA-SC	Creosote scrub, desertscrub, and grasslands on loose or sandy soils. Nearest recorded occurrence is from the Chuckwalla DWMA, approximately 25 mi west of the SEZ. About 3,749,649 acres of potentially suitable habitat occurs within the SEZ region.	146,000 acres of potentially suitable habitat lost (3.9% of available suitable habitat)	427,000 acres of potentially suitable habitat (11.4% of available potentially suitable habitat)	Moderate overall impact. Pre-disturbance surveys and avoidance or minimization of disturbance to occupied habitats on the SEZ or compensatory mitigation of direct effects on occupied habitats could reduce impacts.
Pocketed free-tailed bat	*Nyctinomops femorosaccus*	CA-S2; CA-SC; FWS-SC	Year-round resident in SEZ region lowland areas, including creosotebush and chaparral habitats in association with very large boulders, high cliffs, rugged rock outcroppings, and rocky canyons. Nearest recorded occurrences are 37 mi south of the SEZ. About 1,964,239 acres of potentially suitable habitat occurs within the SEZ region.	65,300 acres of potentially suitable habitat lost (3.3% of available suitable habitat)	195,000 acres of potentially suitable habitat (9.9% of available potentially suitable habitat)	Moderate overall impact on mostly foraging habitat. Pre-disturbance surveys and avoidance or minimization of disturbance to discovered roost areas on the SEZ could reduce impacts.

TABLE 9.4.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Mammals (Cont.)						
Spotted bat	*Euderma maculatum*	BLM-S; CA-S2	Year-round resident in SEZ region in deserts, grasslands, and mixed coniferous forests at elevations below 10,000 ft. Roosts in caves, rock crevices, and buildings. Nearest recorded occurrence is 40 mi west of the SEZ. Suitable habitat exists on the site. About 2,363,936 acres of potentially suitable habitat occurs within the SEZ region.	65,300 acres of potentially suitable habitat lost (2.8% of available suitable habitat)	195,500 acres of potentially suitable habitat (8.3% of available potentially suitable habitat)	Moderate overall impact on mostly foraging habitat. Pre-disturbance surveys and avoidance or minimization of disturbance to discovered roost areas on the SEZ could reduce impacts.
Townsend's big-eared bat	*Corynorhinus townsendii*	BLM-S; CA-S2; CA-SC; FWS-SC	Year-round resident in SEZ region in all habitats but subalpine and alpine habitats, and at any season. Roosts in caves, mines, tunnels, buildings, or other man-made structures. Known to occur in the affected area. Nearest recorded occurrences are approximately 4 mi southeast of the SEZ. About 5,065,765 acres of potentially suitable habitat occurs within the SEZ region.	118,000 acres of potentially suitable habitat lost (2.3% of available suitable habitat)	581,500 acres of potentially suitable habitat (11.5% of available potentially suitable habitat)	Moderate overall impact on mostly foraging habitat. Pre-disturbance surveys and avoidance or minimization of disturbance to discovered roost areas on the SEZ could reduce impacts.

TABLE 9.4.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Mammals (Cont.)						
Western mastiff bat	*Eumops perotis californicus*	BLM-S; CA-SC; FWS-SC	Year-round resident in SEZ region in open semiarid habitats, including conifer and deciduous woodlands, shrublands, grasslands, chaparral, and urban areas. Roosts in crevices in cliff faces, buildings, and tall trees. Known to occur in the affected area. Nearest recorded occurrence is 5 mi south of the SEZ. About 4,069,881 acres of potentially suitable habitat occurs within the SEZ region.	118,000 acres of potentially suitable habitat lost (2.9% of available suitable habitat)	581,500 acres of potentially suitable habitat (14.3% of available potentially suitable habitat)	Moderate overall impact on mostly foraging habitat. Pre-disturbance surveys and avoidance or minimization of disturbance to discovered roost areas on the SEZ could reduce impacts.
Western small-footed myotis	*Myotis ciliolabrum*	BLM-S; CA-S2	Year-round resident in SEZ region in woodland and riparian habitats at elevations below 9,000 ft. Roosts in caves, buildings, mines, and crevices of cliff faces. Nearest recorded occurrence is from the Chocolate Mountains, approximately 30 mi south of the SEZ. About 661,873 acres of potentially suitable habitat occurs within the SEZ region.	15,500 acres of potentially suitable habitat lost (2.3% of available suitable habitat)	83,000 acres of potentially suitable habitat (12.5% of available potentially suitable habitat)	Moderate overall impact on mostly foraging habitat. Pre-disturbance surveys and avoidance or minimization of disturbance to discovered roost areas on the SEZ could reduce impacts.

TABLE 9.4.12.1-1 (Cont.)

Common Name	Scientific Name	Listing Status[b]	Habitat[c]	Maximum Area of Potential Habitat Affected[d]		Overall Impact Magnitude[g] and Species-Specific Mitigation[h]
				Within SEZ (Direct Effects)[e]	Outside SEZ (Indirect Effects)[f]	
Mammals (Cont.)						
Western yellow bat	*Lasiurus xanthinus*	BLM-S; AZ-WSC; AZ-S2; CA-SC	Year-round resident in SEZ region in desert riparian, desert wash, and palm oasis habitats at elevations below 2,000 ft. Roosts in trees. Nearest recorded occurrence is from Blythe, California, approximately 6 mi east of the SEZ. About 1,340,978 acres of potentially suitable habitat occurs within the SEZ region.	15,500 acres of potentially suitable habitat lost (1.2% of available suitable habitat)	83,000 acres of potentially suitable habitat (6.2% of available potentially suitable habitat)	Moderate overall impact on mostly foraging habitat. Pre-disturbance surveys and avoidance or minimization of disturbance to discovered roost areas on the SEZ could reduce impacts.
Yuma mountain lion	*Puma concolor browni*	CA-S1; CA-SC	Riparian bottomlands, cottonwood-willow forests, mesquite bosques, adjacent desert foothills, low rocky mountains, and canyons within desert, chaparral shrubland, and mixed woodland communities especially sites with dense vegetation, caves or other natural cavities, rocky outcrops ranging, and tree/brush edges. Elevation ranges from 1,000 to 3,500 ft. Nearest recorded occurrences are 25 mi south of the SEZ. About 2,833,446 acres of potentially suitable habitat occurs within the SEZ region.	126,000 acres of potentially suitable habitat lost (4.4% of available suitable habitat)	458,000 acres of potentially suitable habitat (16.2% of available potentially suitable habitat)	Moderate overall impact. Pre-disturbance surveys and avoidance or minimization of disturbance to habitats within the SEZ that serve as movement corridors could further reduce impacts.

Footnotes on next page.

TABLE 9.4.12.1-1 (Cont.)

[a] The species presented in this table represent new species identified following publication of the Draft Solar PEIS or a re-evaluation of those species that were determined to have moderate or large impacts in the Draft Solar PEIS. The other special status species for this SEZ are identified in Table 9.4.12.1-1 of the Draft Solar PEIS.

[b] BLM-S = listed as a sensitive species by the BLM; CA-E = listed as endangered by the State of California; CA-S1 = ranked as S1 in the state of California; CA-S2 = ranked as S2 in the state of California; CA-T = listed as threatened by the State of California; ESA-T = listed as threatened under the ESA; ESA-UR = under review for listing under the ESA; FWS-SC = USFWS species of concern. An asterisk denotes that the listing status applies to populations only within the state of Arizona.

[c] For plant and invertebrate species, potentially suitable habitat was determined by using CAReGAP and SWReGAP land cover types (USGS 2005; Davis et al. 1998). For reptile, bird, and mammal species, potentially suitable habitat was determined by using CAReGAP and SWReGAP habitat suitability models as well as land cover models (USGS 2005; Davis et al. 1998). Area of potentially suitable habitat for each species is presented for the SEZ region, defined as the area within 50 mi (80 km) of the SEZ center.

[d] Maximum area of potentially suitable habitat that could be affected relative to availability within the SEZ region. Habitat availability for each species within the region was determined using CAReGAP or SWReGAP habitat suitability and land cover models (USGS 2005; Davis et al. 1998). This approach probably overestimates the amount of suitable habitat in the project area. Impacts of access road and transmission line construction, upgrade, or operation are not assessed in this evaluation because of the proximity of existing infrastructure to the SEZ.

[e] Direct effects within the SEZ consist of the ground-disturbing activities associated with construction and the maintenance of an altered environment associated with operations.

[f] Area of indirect effects was assumed to be the area adjacent to the SEZ within 5 mi (8 km) of the SEZ boundary. Indirect effects include effects from surface runoff, dust, noise, lighting, and so on from the SEZ, but do not include ground-disturbing activities. The potential degree of indirect effects would decrease with increasing distance from the SEZ.

[g] Overall impact magnitude categories were based on professional judgment and include (1) *small*: ≤1% of the population or its habitat would be lost, and the activity would not result in a measurable change in carrying capacity or population size in the affected area; (2) *moderate*: >1 but ≤10% of the population or its habitat, would be lost and the activity would result in a measurable but moderate (not destabilizing) change in carrying capacity or population size in the affected area; and (3) *large*: >10% of a population or its habitat would be lost and the activity would result in a large, measurable, and destabilizing change in carrying capacity or population size in the affected area. Note that much greater weight was given to the magnitude of direct effects because those effects would be difficult to mitigate. Programmatic design features would reduce most indirect effects to negligible levels.

[h] Species-specific mitigations are suggested here, but final mitigations should be developed in consultation with state and federal agencies and should be based on pre-disturbance surveys.

[i] Elevations in the areas of direct and indirect effects range from about 230 ft (70 m) to 3,800 ft (1,160 m).

[j] To convert ft to m, multiply by 0.3048.

[k] To convert acres to km^2, multiply by 0.004047.

[l] To convert mi to km, multiply by 1.6093.

[m] Species in bold text have been recorded or have designated critical habitat in the affected area.

Golden Eagle

The golden eagle is an uncommon to common permanent resident in southern California. This species was not analyzed for the Riverside East SEZ in the Draft Solar PEIS. The species inhabits rolling foothills, mountain areas, and desert shrublands. It nests on cliff faces and in large trees in open areas. Potentially suitable foraging habitat for this species may occur on the revised area of the SEZ and throughout the area of indirect effects (Table 9.4.12.1-1). On the basis of an evaluation of CAReGAP land cover types, approximately 5,000 acres (20 km^2) of cliffs and rock outcrops, which may represent potentially suitable nesting habitat, occurs on the SEZ (Table 9.4.12.1-1). However, nesting habitat for the golden eagle is not likely to occur on the SEZ, because lands with <5% slope are not suitable golden eagle nesting habitat.

9.4.12.1.3 State-Listed Species

Two species listed by the State of California were discussed in the Draft Solar PEIS for the Riverside East SEZ—the desert tortoise and the Gila woodpecker. The desert tortoise is listed as threatened under the CESA; this species was previously discussed as a species listed under the ESA (Section 9.4.12.1.1). The Gila woodpecker is listed as endangered under the CESA. As determined in the Draft Solar PEIS, impacts on this species were determined to be small; no updated information for this species is presented in this Final Solar PEIS, because there is no new information regarding the species' potential occurrence on the SEZ and impacts on this species from solar energy development within the revised SEZ are still considered to be small.

One additional species included in this Final Solar PEIS—the golden eagle—is listed as a California fully protected species. This species was previously discussed as a BLM-designated sensitive species (Section 9.4.12.1.2).

9.4.12.1.4 Rare Species

Of the 68 rare species evaluated in the Draft Solar PEIS for the Riverside East SEZ, 64 of these species are re-evaluated in this Final Solar PEIS. Of these rare species, 37 have not been discussed as ESA-listed species (Section 9.4.12.1.1), BLM-designated sensitive (Section 9.4.12.1.2), or state-listed (Section 9.4.12.1.3). Each of these species has the potential to occur in the affected area of the revised Riverside East SEZ. Information regarding the ecology and distribution of potentially suitable habitat for these species is presented in Table 9.4.12.1-1.

9.4.12.2 Impacts

Overall impact magnitude categories were based on professional judgment and include (1) *small*: a relatively small proportion (≤1%) of the special status species' habitat within the SEZ region would be lost; (2) *moderate*: an intermediate proportion (>1 but ≤10%) of the special status species' habitat would be lost; and (3) *large*: >10% of the special status species' habitat would be lost.

As presented in the Draft Solar PEIS, solar energy development within the Riverside East SEZ could affect potentially suitable habitats of special status species. The analysis presented in the Draft Solar PEIS for the Riverside East SEZ indicated that development would result in moderate or large overall impacts on most special status species (Table 9.4.12.1-1 in the Draft Solar PEIS). Development within the revised Riverside East SEZ could still affect the same special status species evaluated in the Draft Solar PEIS. However, the reduction in the SEZ boundaries and the developable area of the Riverside East SEZ would result in reduced impact levels compared to original estimates in the Draft Solar PEIS. Those species that were determined to have moderate or large impacts in the Draft Solar PEIS are discussed below and in Table 9.4.12.1-1. Impacts on species that were determined to have small overall impacts in the Draft Solar PEIS are not discussed, because impacts on these species in the revised SEZ are expected to remain small.

In addition, impacts on the golden eagle—a special status species that was not evaluated for the Riverside East SEZ in the Draft Solar PEIS—are discussed below and in Table 9.4.12.1-1. The impact assessment for this additional species was carried out in the same way as for those species analyzed in the Draft Solar PEIS (Section 9.4.12.2 of the Draft Solar PEIS).

9.4.12.2.1 Impacts on Species Listed under the Endangered Species Act

The desert tortoise is listed as threatened under the ESA and is known to occur throughout the SEZ affected area. This species was evaluated in the Draft Solar PEIS. It is widespread in Mojave desertscrub communities where firm soils are present for digging burrows. The desert tortoise has the potential to occur within the revised SEZ on the basis of observed occurrences on and near the SEZ and the presence of apparently suitable habitat in the SEZ (Figure 9.4.12.1-1; Table 9.4.12.1-1). According to habitat suitability models, approximately 136,800 acres (554 km^2) of potentially suitable habitat could be directly affected by construction and operations of solar energy development on the revised SEZ (Table 9.4.12.1-1). This direct effects area represents about 3.3% of available suitable habitat of the desert tortoise in the region. The USGS desert tortoise model (Nussear et al. 2009) indicates that the majority of the SEZ is composed of less suitable habitat than the surrounding landscape (modeled suitability value ≤0.5 out of 1.0). About 442,000 acres (1,789 km^2) of suitable habitat occurs in the area of potential indirect effects; this area represents about 10.5% of the available suitable habitat in the region (Table 9.4.12.1-1).

On the basis of desert tortoise surveys conducted in Joshua Tree NP, near the western border of the revised SEZ, the USFWS estimated that 80% build-out of scale solar energy development on the SEZ may directly affect up to 2,865 desert tortoises on the SEZ (Stout 2009). In addition to direct impacts, development on the SEZ could indirectly affect desert tortoises by fragmenting and degrading adjacent habitat.

Information provided by the USFWS since the publication of the Draft Solar PEIS has identified the SEZ as being situated in an area that provides habitat and genetic connectivity between areas with greater habitat suitability north and south of the SEZ where desert tortoise

densities are presumably higher (Figure 9.4.12.1-1) (Ashe 2012). The USFWS has also determined that some portions of the SEZ are within high-priority connectivity areas, which are necessary to facilitate natural processes of gene exchange between populations in order to maintain population viability. Solar energy development on the Riverside East SEZ, therefore, may isolate and fragment these tortoise populations by creating impediments to natural migration patterns. The SEZ is situated between the Chuckwalla and Pinto Mountains DWMAs (these DWMAs also contain USFWS-designated critical habitat for desert tortoise), and the SEZ may provide important connectivity for desert tortoise movements between the DWMAs (BLM and CDFG 2002; Stout 2009). Therefore, development on the SEZ may disrupt desert tortoise population dynamics in nearby DWMAs and designated critical habitat. Fragmentation would be exacerbated by the installation of exclusionary fencing at the perimeter of the SEZ or individual project areas.

The overall impact on the desert tortoise from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised Riverside East SEZ is considered moderate, because the amount of potentially suitable habitat for this species in the area of direct effects represents between 1 and 10% of potentially suitable habitat in the region, and the implementation of programmatic design features alone is unlikely to substantially reduce these impacts. Avoidance of all potentially suitable habitats for this species is not a feasible means of mitigating impacts, because these habitats (desertscrub) are widespread throughout the area of direct effects.

Development of actions to reduce impacts (e.g., reasonable and prudent alternatives, reasonable and prudent measures, and terms and conditions) for the desert tortoise would require formal consultation with the USFWS under Section 7 of the ESA. This project-level consultation will tier from the programmatic ESA Section 7 consultation that will be completed with the PEIS ROD. Priority should be given to the development of a thorough survey protocol and measures to avoid impacts on known tortoise populations. If necessary, minimization measures and mitigation measures, which could potentially include translocation actions and compensatory mitigation, may be required. These consultations may be used to authorize incidental take statements (if necessary). In addition, the CESA provides authority to the CDFG to regulate potential impacts on the desert tortoise and other species listed under the CESA. Therefore, formal consultation with the CDFG would also be required to permit the incidental take of desert tortoises in the SEZ.

Inherent dangers to tortoises are associated with their capture, handling, and translocation from the SEZ. These actions, if conducted improperly, can result in injury or death. To minimize these risks and as stated above, the desert tortoise translocation plan should be developed in consultation with the USFWS and CDGF and follow the *Guidelines for Handling Desert Tortoises During Construction Projects* (Desert Tortoise Council 1994) and other current translocation guidance provided by the USFWS and CDFG. Consultation will identify potentially suitable recipient locations, density thresholds for tortoise populations in recipient locations, procedures for pre-disturbance clearance surveys and tortoise handling, as well as disease testing and post-translocation monitoring and reporting requirements. Despite some risk of mortality or decreased fitness of the desert tortoise, translocation is widely accepted as a useful strategy for the conservation of this species (Field et al. 2007).

To offset impacts of solar development on the SEZ, compensatory mitigation may be needed to balance the acreage of habitat lost with acquisition of lands that would be improved and protected for desert tortoise populations (USFWS 1994). Compensation can be accomplished by improving the carrying capacity for the desert tortoise on the acquired lands. Other mitigation actions may include funding for the enhancement of desert tortoise habitat on existing federal lands. Consultations with the USFWS and CDGF would be necessary to determine the appropriate mitigation ratio to acquire, enhance, and preserve desert tortoise compensation lands.

9.2.12.2.2 Impacts on BLM-Designated Sensitive Species

Impacts on the 25 BLM-designated sensitive species that are re-evaluated for this Final Solar PEIS are discussed in Table 9.4.12.1-1. Impacts for two of these species (alkali mariposa-lily and Nelson's bighorn sheep) were reduced from moderate to small overall levels. For all other BLM-designated sensitive species re-evaluated for this Final Solar PEIS, there is no additional information that would alter the potential for these species to be affected by solar energy development within the revised SEZ (see Section 9.4.12.2.2 in the Draft Solar PEIS for a discussion of impacts on these species); overall impact determinations for these remaining BLM-designated sensitive species remain moderate or large (Table 9.4.12.1-1). Impacts on the one additional BLM-designated sensitive species, the golden eagle, are discussed below.

Golden Eagle

The golden eagle was not analyzed for the Riverside East SEZ in the Draft Solar PEIS. This species is an uncommon to common permanent resident in southern California, and potentially suitable foraging habitat is expected to occur in the affected area of the revised Riverside East SEZ. Approximately 65,300 acres (264 km^2) of potentially suitable foraging habitat on the SEZ could be directly affected by construction and operations (Table 9.4.12.1-1). This direct effects area represents 2.1% of potentially suitable habitat in the SEZ region. About 244,600 acres (990 km^2) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 7.9% of the available suitable foraging habitat in the SEZ region (Table 9.4.12.1-1). Most of this area could serve as foraging habitat (open shrublands). On the basis of an evaluation of CAReGAP land cover types, approximately 5,000 acres (20 km^2) of cliffs and rock outcrops, which may represent potentially suitable nesting habitat, occurs on the SEZ (Table 9.4.12.1-1).

The overall impact on the golden eagle from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised Riverside East SEZ is considered moderate, because the amount of potentially suitable habitat for this species in the area of direct effects represents between 1% and 10% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of direct impacts on all potentially suitable foraging habitat is not a feasible way to mitigate impacts on the golden eagle, because potentially suitable shrubland is widespread throughout the area of direct effects and readily available in other portions of the affected area.

9.4.12.2.3 Impacts on State-Listed Species

Two species listed by the State of California were discussed in the Draft Solar PEIS for the Riverside East SEZ—the desert tortoise and the Gila woodpecker. The desert tortoise is listed as threatened under the CESA; impacts on this species were previously discussed in Section 9.4.12.2.1) due to this species' status under the ESA. The Gila woodpecker is listed as endangered under the CESA. As determined in the Draft Solar PEIS, impacts on this species were determined to be small; no updated information for this species is presented in this Final Solar PEIS, because there is no new information regarding the species' potential occurrence on the SEZ and impacts on this species from solar energy development within the revised SEZ are still considered to be small.

One additional species included in this Final Solar PEIS, the golden eagle, is listed as a California fully protected species. Impacts on this species were previously discussed in Section 9.4.12.2.2 due to this species' status under the BLM.

9.4.12.2.4 Impacts on Rare Species

Of the 68 rare species evaluated in the Draft Solar PEIS for the Riverside East SEZ, 64 of these species are re-evaluated in this Final Solar PEIS. Of these rare species, impacts on 37 have not been previously discussed in Sections 9.4.12.2.1, 9.4.12.2.2, or 9.4.12.2.3. Each of these species has the potential to occur in the affected area of the revised Riverside East SEZ. Impacts for these remaining 37 special status species are presented in Table 9.4.12.1-1.

9.4.12.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on special status and rare species are described in Section A.2.2 of Appendix A of this Final Solar PEIS. SEZ-specific resources and conditions will guide how programmatic design features are applied, for example:

- Pre-disturbance surveys shall be conducted within the SEZ to determine the presence and abundance of special status species, including those identified in Table 9.4.12.1-1 of the Draft Solar PEIS and the golden eagle. Disturbance to occupied habitats for these species shall be avoided or minimized to the extent practicable. If avoiding or minimizing impacts on occupied habitats is not possible, translocation of individuals from areas of direct effects, or compensatory mitigation of direct effects on occupied habitats may be used to reduce impacts. A comprehensive mitigation strategy for special status species that uses one or more of these options to offset the impacts of development shall be developed in coordination with the appropriate federal and state agencies.

- Disturbance of desert playa and wash habitats within the SEZ shall be avoided or minimized to the extent practicable. Ford Dry Lake, Palen Lake, and

McCoy Wash represent the greatest amount of desert playa and wash habitat on the SEZ, and these habitats have been identified as non-developable areas. Pre-disturbance surveys shall be conducted to determine the presence of additional desert playa and wash habitat within the developable area; development within these habitats shall be avoided or minimized to the extent practicable. Adverse impacts on the following species may be reduced with the avoidance of these playas and desert wash habitats on the SEZ: alkali mariposa-lily, California saw-grass, Coves' cassia, Emory's crucifixion-thorn, jackass-clover, Salt Spring checkerbloom, sand evening-primrose, Roberts' rhopalolemma bee, and crissal thrasher.

- Disturbance of sand dune habitats and sand transport systems on the SEZ shall be avoided or minimized to the extent practicable. Substantial sand dune habitat has now been eliminated from the developable area within the SEZ. However, pre-disturbance surveys shall be conducted to determine the presence of additional sand dune habitat within the developable area; development within these habitats shall be avoided or minimized to the extent practicable. Adverse impacts on the following species could be reduced with the avoidance of sand dune habitats and sand transport systems: chaparral sand-verbena, dwarf germander, giant Spanish-needle, Harwood's eriastrum, jackass-clover, little San Bernardino Mountains linanthus, and Mojave fringe-toed lizard.

- Consultations with the USFWS and the CDFG shall be conducted to address the potential for impacts on the desert tortoise, a species listed as threatened under the ESA and CESA. Consultation will identify an appropriate survey protocol, avoidance measures, and, if appropriate, reasonable and prudent alternatives, reasonable and prudent measures, and terms and conditions for incidental take statements.

- Occupied habitats for species that are designated as California fully protected species shall be completely avoided. Under California Fish and Game Code Sections 3511, 4700, 5050, and 5515, take or possession of these species is prohibited at any time. Minimization and mitigation measures cannot be developed for California fully protected species. This policy applies to any habitats utilized by the golden eagle in the affected area of the revised Riverside East SEZ.

It is anticipated that implementation of these programmatic design features will reduce the majority of impacts on the special status species from habitat disturbance and groundwater use.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, the following SEZ-specific design feature for special status species has been identified:

Within the SEZ, two north–south wildlife corridors of sufficient width (a minimum width of 1.3 mi [2 km], but wider if determined to be necessary through future site-specific studies) should be identified by the BLM in coordination with the FWS and the California Department of Game and Fish. These corridors should be identified as non-development areas within the SEZ on the basis of modeling data (Penrod et al 2012) and subsequent field verification of permeability for wildlife.

The need for additional SEZ-specific design features will be identified through the process of preparing parcels for competitive offer and subsequent project specific analysis. Projects will comply with terms and conditions set forth by the USFWS Biological Opinion resulting from the programmatic consultation and any necessary project-specific ESA Section 7 consultations.

9.4.13 Air Quality and Climate

9.4.13.1 Affected Environment

Except as noted below, the information for air quality and climate presented in the affected environment section of the Draft Solar PEIS remains valid.

9.4.13.1.1 Existing Air Emissions

The Draft Solar PEIS presented Riverside County emissions data for 2002. More recent data for 2008 (ARB 2009) were reviewed. The two emissions inventories are from different sources and assumptions; for example, the 2008 data did not include biogenic VOC emissions. In the more recent data, emissions of SO_2, CO, VOCs and $PM_{2.5}$ were lower, while emissions of NO_x and PM_{10} were higher. These changes would not affect modeled air quality impacts presented in this update.

9.4.13.1.2 Air Quality

The calendar quarterly average NAAQS of 1.5 $\mu g/m^3$ for lead (Pb) presented in Table 9.4.13.1-2 of the Draft Solar PEIS has been replaced by the rolling 3-month standard (0.15 $\mu g/m^3$). The federal 24-hour and annual SO_2 and 1-hour O_3, standards have been revoked as well (EPA 2011). These changes will not affect the modeled air quality impacts presented in this Final Solar PEIS. CAAQS have not been changed.

Given the reduced size of the proposed Riverside East SEZ, the distances to the nearest Class I areas are somewhat larger than were presented in the Draft Solar PEIS. Previously, Joshua Tree NP abutted the proposed SEZ. With the revised boundaries, Joshua Tree NP is about

1.8 mi (2.9 km) from the nearest SEZ boundary. All other Class I areas are located beyond 62 mi (100 km) of the updated boundaries of the proposed Riverside East SEZ.

9.4.13.2 Impacts

9.4.13.2.1 Construction

Methods and Assumptions

The methods and assumptions remain almost the same as presented in the Draft Solar PEIS, except for the following. In the Draft Solar PEIS, a hypothetical disturbance area of 9,000 acres (36.4 km^2) was modeled, assumed to be located between the Joshua Tree NP and scattered residences north of Lake Tamarisk to maximize potential impacts on both. In this Final Solar PEIS, the assumed location of the disturbance area of 9,000 acres (36.4 km^2) was moved to the south near Lake Tamarisk and the town of Desert Center because of the removal from the SEZ of the northernmost areas adjacent to Joshua Tree NP. Because of this southward shift of the modeled area, predicted concentration levels are lower at Joshua Tree NP but higher at residences than those presented in the Draft Solar PEIS.

Results

Potential particulate air impacts from construction were remodeled based on the revised boundaries of the proposed Riverside East SEZ.[2] As noted in Table 9.4.13.2-1 of the Draft Solar PEIS, the background levels of 24-hour and annual PM_{10} in the Draft were above the standard levels used for comparison. Thus, any increase from construction emissions would increase levels already above the comparison levels. Background levels of annual $PM_{2.5}$ were 90% of the standard level. Changes in magnitude to predicted impacts at the boundary would be expected to be larger than changes at greater distances from the SEZ. Table 9.4.13.2-1 presents the updated maximum modeled concentrations from construction fugitive dust.

Although the total disturbed area analyzed was the same for the Draft Solar PEIS and this Final Solar PEIS, the revised maximums at the SEZ boundaries are lower by about 10 to 25% than those in the Draft Solar PEIS, although totals could still exceed the NAAQS/SAAQS levels. These updated predictions are still consistent with the conclusion in the Draft Solar PEIS that

[2] At this programmatic level, detailed information on construction activities, such as facility size, type of solar technology, heavy equipment fleet, activity level, work schedule, and the like, is not known; thus air quality modeling cannot be conducted. It has been assumed that an area of 9,000 acres (36.4 km^2) in total would be disturbed continuously; thus the modeling results and discussion here should be interpreted in that context. During the site-specific project phase, more detailed information would be available and more realistic air quality modeling analysis could be conducted. It is likely that impacts on ambient air quality predicted for specific projects would be much lower than those in this Final Solar PEIS.

TABLE 9.4.13.2-1 Maximum Air Quality Impacts from Emissions Associated with Construction Activities for the Proposed Riverside East SEZ as Revised

Pollutant[a]	Averaging Time	Rank[b]	Concentration (μg/m^3) Maximum Increment[b]	Background[c]	Total	NAAQS/ CAAQS[d]	Percentage of NAAQS/CAAQS[e] Increment	Total
PM_{10}	24 hours	H6H	441	157	598	150/50	294/881	398/1,195
	Annual	NA[f]	76.2	56.0	132	NA/20	NA/381	NA/661
$PM_{2.5}$	24 hours	H8H	28.2	26.8	55.0	35/NA	81/NA	157/NA
	Annual	NA	7.6	10.8	18.4	15/12	51/64	123/154

[a] $PM_{2.5}$ = particulate matter with a diameter of ≤2.5 μm; PM_{10} = particulate matter with a diameter of ≤10 μm.

[b] Concentrations for attainment demonstration are presented. H6H = highest of the sixth-highest concentrations at each receptor over the 5-year period. H8H = highest of the multiyear average of the eighth-highest concentrations at each receptor over the 5-year period. For the annual average, multiyear averages of annual means over the 5-year period are presented. Maximum concentrations are predicted to occur at the site boundaries.

[c] See Table 9.4.13.1-2 of the Draft Solar PEIS.

[d] First and second values are NAAQS and CAAQS, respectively.

[e] First and second values are concentration levels as a percentage of NAAQS and CAAQS, respectively.

[f] NA = not applicable.

maximum particulate levels in the vicinity of the SEZ could exceed the standard levels used for comparison. These high particulate concentrations would be limited to the immediate vicinity of the proposed SEZ boundary and would decrease quickly with distance.

Other locations modeled include the nearest residences, Lake Tamarisk, Desert Center, and Eagle Mountain Pumping Station. With the change in assumed location of the construction disturbance area, modeled impacts increased at most of these locations. For example, at Lake Tamarisk, 24-hour PM_{10} concentration increments changed from 80 μg/m^3 in the Draft Solar PEIS to 120 μg/m^3 in this Final Solar PEIS.

Predicted 24-hour and annual PM_{10} concentration increments at the nearest Class I Area, Joshua Tree NP, would be about 86 and 5.6 μg/m^3 or 1,077% and 139% of the PSD increments for Class I areas, respectively. Because of the increased distance to Joshua Tree NP, this update estimates PSD increments of one-fifth of the value presented in the Draft Solar PEIS, but these values are still far higher than the maximum allowable PSD increments for Class I areas. Thus, conclusions presented in the Draft Solar PEIS remain valid.

The conclusions of the Draft Solar PEIS remain valid for the predicted 24-hour and annual PM_{10} and $PM_{2.5}$ concentration levels; they could exceed NAAQS and/or CAAQS levels at the SEZ boundaries and in immediate surrounding areas during the construction of solar

facilities. To reduce potential impacts on ambient air quality and to comply with BLM design features, aggressive dust control measures would be used. Potential air quality impacts on nearby residences and towns would be lower. Modeling indicates that construction activities could result in concentrations far above Class I PSD PM_{10} increments at the nearest federal Class I area (Joshua Tree NP). Construction activities are not subject to the PSD program, and the comparison provides only a screen for gauging the size of the impact. In addition, the assumed scenario—in which three construction projects would occur simultaneously near the westernmost portion of the SEZ—is quite conservative. If construction locations were spread across the SEZ or the projects occurred at different times, potential impacts would be anticipated to be much lower. Accordingly, impacts of construction activities on ambient air quality are expected to be moderate and temporary.

Because in both the Draft Solar PEIS and this Final Solar PEIS the same area size is assumed to be disturbed, emissions from construction equipment and vehicles would be almost the same as those mentioned in the Draft Solar PEIS. However, any potential impacts on AQRVs at nearby federal Class I areas (Joshua Tree NP) would be somewhat less than those in the Draft Solar PEIS because of the increased distance to the Joshua Tree NP. Thus, as concluded in the Draft Solar PEIS, emissions from construction-related equipment and vehicles are temporary and could cause some unavoidable but short-term impacts.

9.4.13.2.2 Operations

The reduction in the developable area of the proposed Riverside East SEZ by about 27% from 202,896 acres (821.1 km^2) to 147,910 acres (598.6 km^2) decreases the generating capacity and annual power generation and thus decreases the potentially avoided emissions presented in the Draft Solar PEIS. A revised power generation capacity ranging from 13,148 to 23,666 MW is estimated for the proposed Riverside East SEZ for various solar technologies (see Section 9.4.1.2). As explained in the Draft Solar PEIS, the estimated amount of emissions avoided for the solar technologies evaluated depends only on the megawatts of conventional fossil fuel–generated power displaced. Table 9.4.13.2-2 in the Draft Solar PEIS provided estimates for emissions potentially avoided by a solar facility. These estimates were updated by reducing the tabulated estimates by about 27%, as shown in Table 9.4.13.2-2. For example, for the technologies estimated to require 9 acres/MW (power tower, dish engine, and PV), up to 4,837 tons of NO_x per year (= 72.9% × the low-end value of 6,636 tons per year as tabulated in the Draft Solar PEIS) could be avoided by full solar development of the revised area of the proposed Riverside East SEZ. Although the total emissions avoided by full solar development of the proposed SEZ are reduced from those presented in the Draft Solar PEIS, the conclusions of the Draft Solar PEIS remain valid. Solar facilities built in the proposed Riverside East SEZ could considerably reduce fuel combustion-related emissions in California but relatively less so than those built in other states with higher fossil use rates.

TABLE 9.4.13.2-2 Annual Emissions from Combustion-Related Power Generation Avoided by Full Solar Development of the Proposed Riverside East SEZ as Revised

Area Size (acres)[a]	Capacity (MW)[b]	Power Generation (GWh/yr)[c]	Emissions Avoided (tons/yr; 10^3 tons/yr for CO_2)[d]			
			SO_2	NO_x	Hg	CO_2
147,910	13,148–23,666	23,035–41,462	2,945–5,301 (17,399–31,318)	4,837–8,707 (25,642–46,155)	0.043–0.077 (0.20–0.37)	11,444–20,600 (18,175–32,716)
Percentage of total emissions from electric power systems in the state of California[e]			22–39%	22–39%	22–39%	22–39%
Percentage of total emissions from all source categories in the state of California[f]			4.2–7.5%	0.40–0.72%	–[g]	2.7–4.8%
Percentage of total emissions from electric power systems in the six-state study area[e]			1.2–2.1% (6.9–12%)	1.3–2.4% (6.9–12%)	1.5–2.6% (6.9–12%)	4.4–7.9% (6.9–12%)
Percentage of total emissions from all source categories in the six-state study area[f]			0.62–1.1% (3.7–6.6%)	0.18–0.32% (0.95–1.7%)	–	1.3–2.5% (2.2–3.9%)

[a] To convert acres to km^2, multiply by 0.004047.

[b] It is assumed that the SEZ would eventually have development on 80% of the lands and that a range of 5 acres (0.020 km^2) per MW (for parabolic trough technology) to 9 acres (0.036 km^2) per MW (power tower, dish engine, and PV technologies) would be required.

[c] A capacity factor of 20% is assumed.

[d] Composite combustion-related emission factors for SO_2, NO_x, Hg, and CO_2 of 0.26, 0.42, 3.7×10^{-6}, and 994 lb/MWh, respectively, were used for the state of California. Values in parentheses are estimated based on composite combustion-related emission factors for SO_2, NO_x, Hg, and CO_2 of 1.51, 2.23, 1.8×10^{-6}, and 1,578 lb/MWh, respectively, averaged over six southwestern states.

[e] Emission data for all air pollutants are for 2005.

[f] Emission data for SO_2 and NO_x are for 2002, while those for CO_2 are for 2005.

[g] A dash indicates not estimated.

Sources: EPA (2009a,b); WRAP (2009).

9.4.13.2.3 Decommissioning and Reclamation

The discussion in the Draft Solar PEIS remains valid. Decommissioning and reclamation activities would be of short duration, and their potential air impacts would be moderate and temporary.

9.4.13.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce air quality impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Limiting dust generation during construction and operations is a required programmatic design feature under the BLM

Solar Energy Program. These extensive fugitive dust control measures would keep off-site PM levels as low as possible during construction.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for air quality have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

9.4.14 Visual Resources

9.4.14.1 Affected Environment

The SEZ boundaries have been revised to eliminate 43,439 acres (176 km^2) in the northwest portion of the SEZ. Areas specified for non-development include 11,547 acres (46.7 km^2); these areas consist of intermittent lakes, major washes, and areas identified for non-development through investigations for approved projects. The remaining developable area within the SEZ is 147,910 acres (598.6 km^2). Because of the reduction in size of the SEZ, the total acreage of the lands visible within the 25-mi (40-km) viewshed of the SEZ has decreased.

A VRI map for the SEZ and surrounding lands is shown in Figure 9.4.14.1-1; it provides information from the BLM's September 2010 VRI, which was finalized in October 2011 (BLM 2011l). As shown, the VRI classes for the SEZ are VRI Class II, indicating high relative visual values; Class III, indicating moderate relative visual values; and Class IV, indicating low relative visual values.

Within the 25-mi (40-km), 650-ft (198-m) viewshed of the revised SEZ, land is located in the Barstow, El Centro, Needles, and Palm Springs–South Coast Field Offices. The VRI Classes of these lands are as follows:

- Barstow Field Office
  - 315 acres (1.3 km^2) of VRI Class I areas and
  - 2,950 acres (11.9 km^2) of VRI Class IV.

- El Centro Field Office
  - 12,592 acres (51.0 km^2) of VRI Class I areas,
  - 22,710 acres (91.9 km^2) of VRI Class II areas,
  - 13,857 acres (56.1 km^2) of Class III areas, and
  - 22,628 acres (91.6 km^2) of VRI Class IV.

- Needles Field Office
  - 13,642 acres (55.2 km^2) of VRI Class I areas,
  - 2,602 acres (10.5 km^2) of VRI Class II areas,

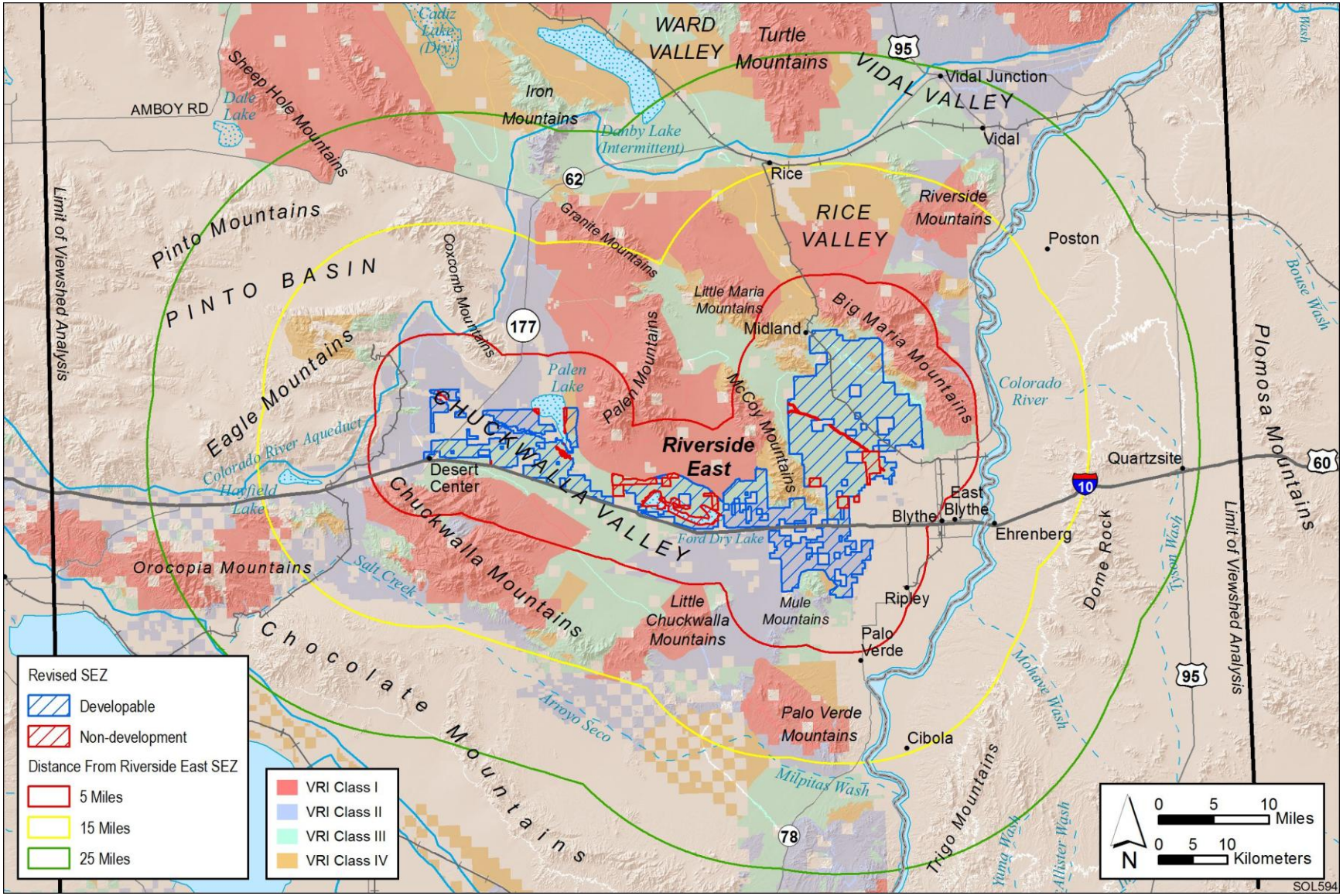

FIGURE 9.4.14.1-1 Visual Resource Inventory Values for the Proposed Riverside East SEZ as Revised

  - 59,803 acres (242.0 km^2) of Class III areas, and
  - 13,266 acres (53.7 km^2) of VRI Class IV.

- Palm Springs–South Coast Field Office
  - 294,529 acres (1,192.0 km^2) of VRI Class I areas,
  - 198,431 acres (803.0 km^2) of VRI Class II areas,
  - 272,605 acres (1,103.2 km^2) of Class III areas, and
  - 92,551 acres (374.5 km^2) of VRI Class IV.

9.4.14.2 Impacts

The reduction in size of the SEZ would substantially reduce the total visual impacts associated with solar energy development in the SEZ. The change limits the total amount of solar facility infrastructure that would be visible and reduces the geographic extent of the visible infrastructure.

The reduction in size eliminated approximately 21% of the original SEZ. The resulting visual contrast reduction for any given point within view of the SEZ would vary greatly depending on the viewpoint's distance and direction from the SEZ. Much of the land surrounding the SEZ would not have views of the areas removed from the SEZ; visual contrasts would not be reduced for these lands. Contrast reduction generally would be greatest for viewpoints closest to the portions of the SEZ that were eliminated and especially for those that had broad, wide-angle views of these areas. In general, contrast reductions also would be larger for elevated viewpoints relative to nonelevated viewpoints, because the reduction in area of the solar facilities would be more apparent when looking down at the SEZ than when looking across it.

9.4.14.2.1 Impacts on the Proposed Riverside East SEZ

Although the reduction in size of the SEZ substantially reduces visual contrasts associated with solar development, solar development still would involve major modification of the existing character of the landscape; it likely would dominate the views from most locations within the SEZ. Additional impacts would occur as a result of the construction, operation, and decommissioning of related facilities, such as access roads and electricity transmission lines. In general, strong visual contrasts from solar development still would be expected to be observed from viewing locations within the SEZ.

9.4.14.2.2 Impacts on Lands Surrounding the Proposed Riverside East SEZ

For the Draft Solar PEIS, preliminary viewshed analyses were conducted to identify which lands surrounding the proposed SEZ could have views of solar facilities in at least some portion of the SEZ (see Appendixes M and N of the Draft Solar PEIS for important information on assumptions and limitations of the methods used). Four viewshed analyses were conducted,

assuming four different heights representative of project elements associated with potential solar energy technologies: PV and parabolic trough arrays, 24.6 ft (7.5 m); solar dishes and power blocks for CSP technologies, 38 ft (11.6 m); transmission towers and short solar power towers, 150 ft (45.7 m); and tall solar power towers, 650 ft (198.1 m).

These same viewsheds were recalculated in order to account for the boundary changes described in the Supplement to the Draft Solar PEIS. Figure 9.4.14.2-1 shows the combined results of the viewshed analyses for all four solar technologies. The colored portions indicate areas with clear lines of sight to one or more areas within the SEZ and from which solar facilities within these areas of the SEZ would be expected to be visible, assuming the absence of screening vegetation or structures and adequate lighting and other atmospheric conditions. The light brown areas are locations from which PV and parabolic trough arrays located in the SEZ could be visible. Solar dishes and power blocks for CSP technologies would be visible from the areas shaded in light brown and the additional areas shaded in light purple. Transmission towers and short solar power towers would be visible from the areas shaded light brown and light purple, and the additional areas shaded in dark purple. Power tower facilities located in the SEZ could be visible from areas shaded light brown, light purple, and dark purple, and at least the upper portions of power tower receivers could be visible from the additional areas shaded in medium brown.

9.4.14.2.3 Impacts on Selected Federal-, State-, and BLM-Designated Sensitive Visual Resource Areas and Other Lands and Resources

Figure 9.4.14.2-2 shows the results of a GIS analysis that overlays selected federal-, state-, and BLM-designated sensitive visual resource areas onto the combined tall solar power tower (650 ft [198.1 m]) and PV and parabolic trough array (24.6 ft [7.5 m]) viewsheds, in order to illustrate which of these sensitive visual resource areas could have views of solar facilities within the SEZ and therefore potentially would be subject to visual impacts from those facilities. Distance zones that correspond with BLM's VRM system-specified foreground–middleground distance (5 mi [8 km]), background distance (15 mi [24.1 km]), and a 25-mi (40.2-km) distance zone are shown as well, in order to indicate the effect of distance from the SEZ on impact levels, which are highly dependent on distance. A similar analysis was conducted for the Draft Solar PEIS.

The scenic resources included in the analysis were as follows:

- National Parks, National Monuments, National Recreation Areas, National Preserves, National Wildlife Refuges, National Reserves, National Conservation Areas, National Historic Sites;

- Congressionally authorized Wilderness Areas;

- Wilderness Study Areas;

- National Wild and Scenic Rivers;

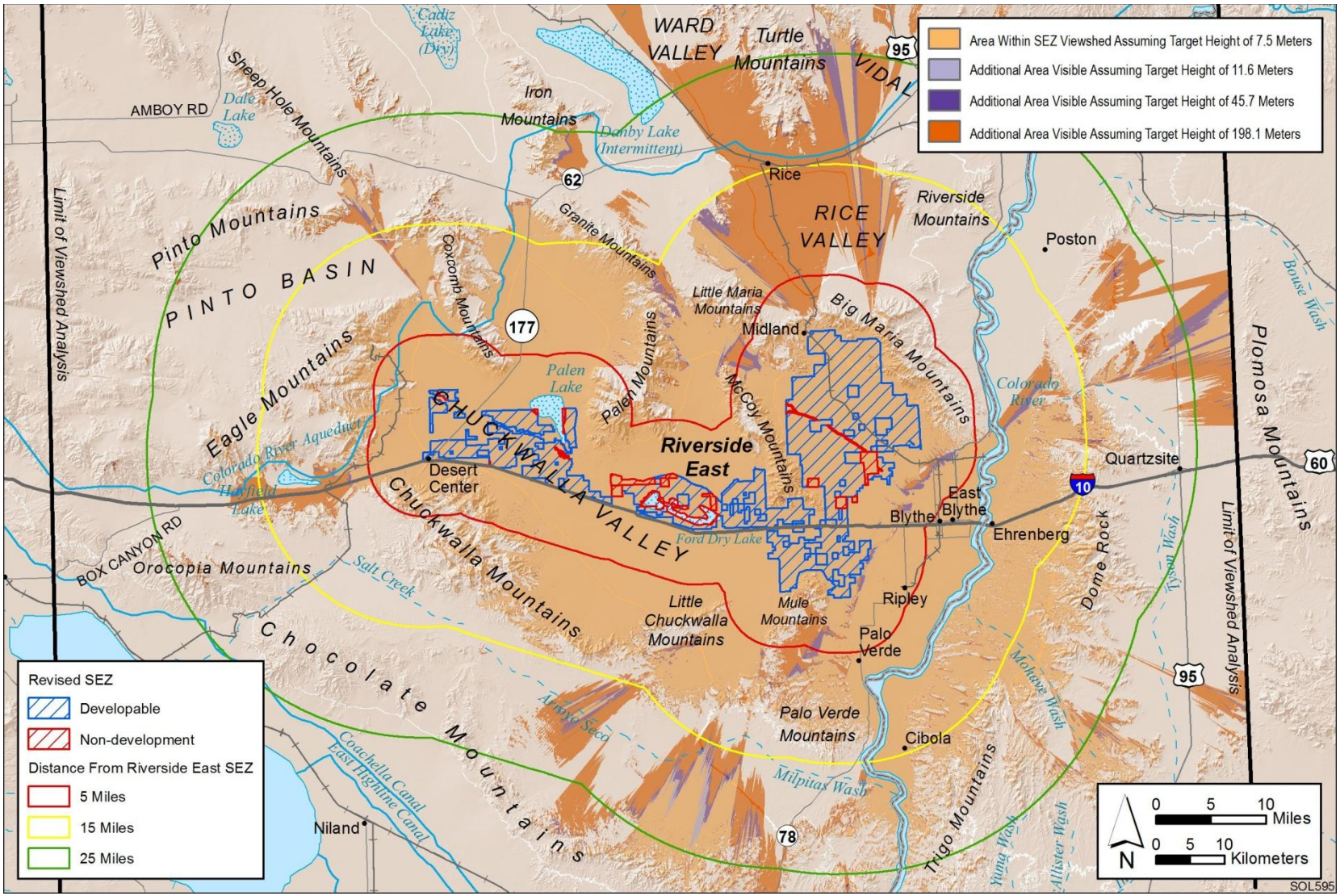

FIGURE 9.4.14.2-1 Viewshed Analyses for the Proposed Riverside East SEZ as Revised and Surrounding Lands, Assuming Viewshed Heights of 24.6 ft (7.5 m), 38 ft (11.6 m), 150 ft (45.7 m), and 650 ft (198.1 m) (shaded areas indicate lands from which solar development and/or associated structures within the SEZ could be visible)

- Congressionally authorized Wild and Scenic Study Rivers;
- National Scenic Trails and National Historic Trails;
- National Historic Landmarks and National Natural Landmarks;
- All-American Roads, National Scenic Byways, State Scenic Highways; and BLM- and USFS-designated scenic highways/byways;
- BLM-designated SRMAs; and
- ACECs designated because of outstanding scenic qualities.

The results of the GIS analysis are summarized in Table 9.4.14.2-1. The change in size of the SEZ alters the viewshed, such that the visibility of the SEZ and solar facilities within the SEZ from the surrounding lands would be reduced.

With the reduction in size of the SEZ, solar energy development within the SEZ would still be expected to create moderate or strong visual contrasts for viewers within many of the surrounding scenic resource areas and other resources listed in Table 9.4.14.2-1. These areas include the CDCA, Joshua Tree NP and WA, Bradshaw Scenic Highway, Big Maria Mountains WA, Chuckwalla Mountains WA, Little Chuckwalla Mountains WA, Palen-McCoy WA, Palo Verde Mountains WA, Rice Valley WA, and Corn Springs ACEC. An additional area that may experience moderate levels of contrast includes the Colorado River Corridor SRMA; this area was not analyzed in the Draft Solar PEIS.

Solar development on lands in the SEZ visible from and in close proximity to Joshua Tree NP and the Palen-McCoy WA has a higher potential to cause visual impacts on the NP and the WA. The BLM has identified lands in the SEZ within areas west of Township 005S and Range 017E and north of Township 006S and Range 016E, as well as north of Sections 26, 27, 28, and 29 of Township 005S and Range 017E, as potential high visual sensitivity areas, where solar development is subject to additional SEZ-specific mitigation that will be identified when project-specific environmental analyses are conducted. Solar development within these areas is also subject to additional SEZ-specific mitigation.

In addition to these areas, impacts on other lands and resource areas were evaluated: I-10; State Route 177; the surrounding communities of Blythe, East Blythe, Ehrenberg, Palo Verde, Ripley, Cibola (Arizona), and Desert Center; and nearby residences.

9.4.14.2.4 Summary of Visual Resource Impacts for the Proposed Riverside East SEZ

The visual contrast analysis in the Draft Solar PEIS determined that because there could be multiple solar facilities within the Riverside East SEZ, a variety of technologies employed, and a range of supporting facilities required, solar development within the SEZ would make it

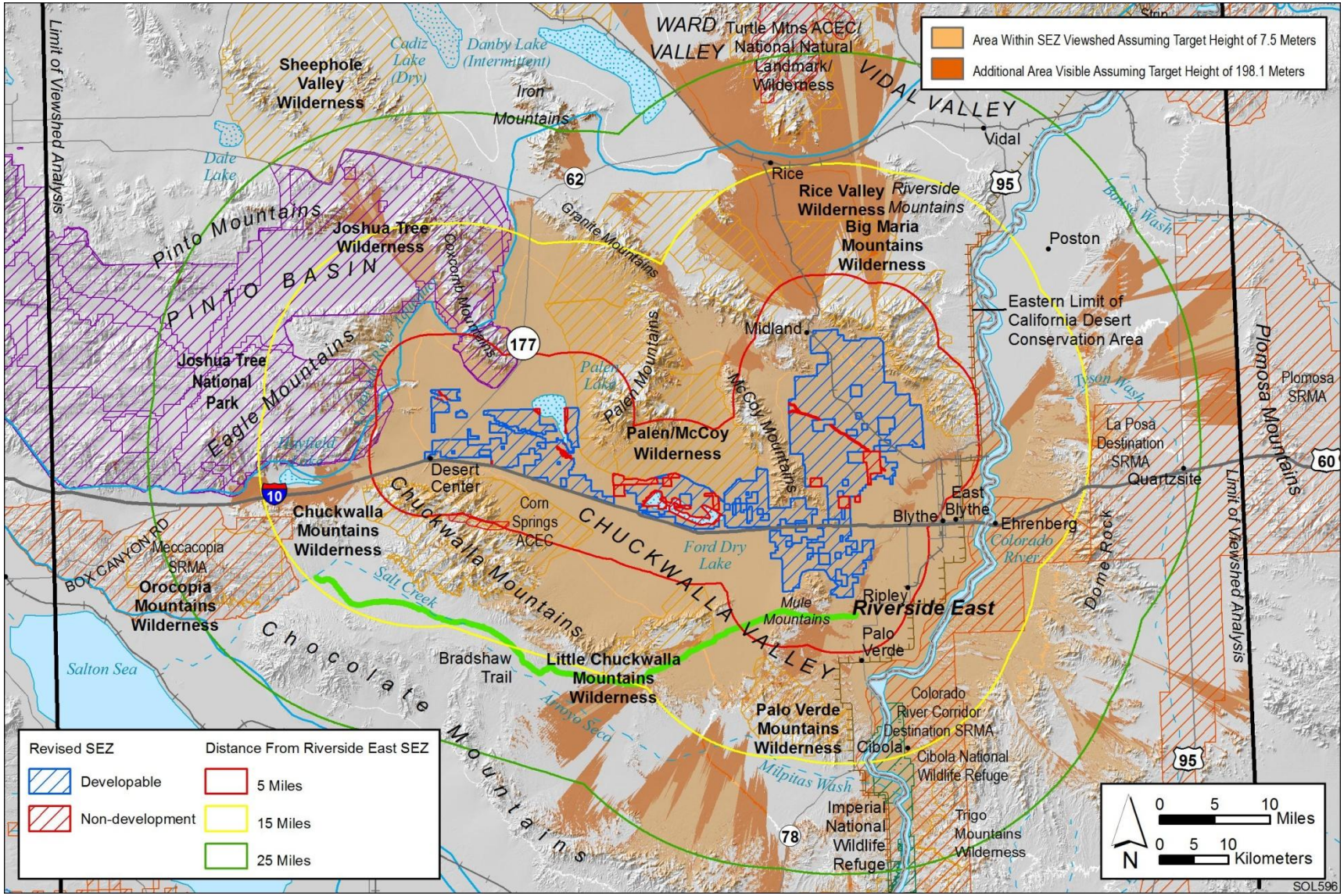

FIGURE 9.4.14.2-2 Overlay of Selected Sensitive Visual Resource Areas onto Combined 650-ft (198.1-m) and 24.6-ft (7.5-m) Viewsheds for the Proposed Riverside East SEZ as Revised

TABLE 9.4.14.2-1 Selected Potentially Affected Sensitive Visual Resources within a 25-mi (40-km) Viewshed of the Proposed Riverside East SEZ as Revised, Assuming a Target Height of 650 ft (198.1 m)

Feature Type	Feature Name (Total Acreage/ Linear Distance)[a,b,c]	Feature Area or Linear Distance[d]		
		Visible within 5 mi	Visible Between 5 and 15 mi	Visible Between 15 and 25 mi
NCA	California Desert (25,919,319 acres)	642,788 acres (2%)[b]	533,852 acres (2%)	276,110 acres (1%)
National Park	Joshua Tree (793,331 acres)	12,656 acres (2%)	68,003 acres (9 %)	36,647 acres (5 %)
Scenic Highway	Bradshaw Trail[e] (70 mi)	8.5 mi (12%)	10.1 mi (14%)	0.7 mi (1%)
WAs	Big Maria Mountains (47,786 acres)	8,861 acres (19%)	42 acres (0%)	0 acres
	Chuckwalla Mountains (101,624 acres)	31,330 acres (31%)	25,597 acres (25%)	0 acres
	Imperial Refuge (15,718 acres)	0 acres	0 acres	508 acres (3%)
	Joshua Tree (591,997 acres)	9,681 acres (2%)	56,742 acres (10%)	32,068 acres (5%)
	Little Chuckwalla Mountains (28,707 acres)	42 acres (0%)	16,619 acres (58%)	69 acres (0%)
	Orocopia Mountains (59,784 acres)	0 acres	199 acres (0%)	2,231 acres (4%)
	Palen-McCoy (247,033 acres)	70,838 acres (29%)	104,311 acres (42%)	9,039 acres (4%)
	Palo Verde Mountains (31,858 acres)	0 acres	13,701 acres (43%)	0 acres
	Rice Valley (43,438 acres)	7,737 acres (18%)	28,072 acres (65%)	0 acres
	Sheephole Valley (195,346 acres)	0 acres	0 acres	477 acres (0%)

TABLE 9.4.14.2-1 (Cont.)

Feature Type	Feature Name (Total Acreage/ Linear Distance)[a,b,c]	Feature Area or Linear Distance[d]		
			Visible Between	
		Visible within 5 mi	5 and 15 mi	15 and 25 mi
WAs (*Cont.*)	Trigo Mountains (30,403 acres)	0 acres	0 acres	3,432 acres (11%)
	Turtle Mountains (182,493 acres)	0 acres	0 acres	13,161 acres (7%)
NWRs	Cibola (18,398 acres)	0 acres	7,161 acres (39%)	17,133 acres (93%)
	Imperial (31,465 acres)	0 acres	0 acres	1,666 acres (5%)
ACECs Designated for Outstanding Scenic Values	Corn Springs (2,463 acres)	332 acres (13%)	747 acres (30%)	0 acres
	Turtle Mountains (50,057 acres)	0 acres	0 acres	2,198 acres (4%)

[a] To convert acres to km^2, multiply by 0.004047.

[b] To convert mi to km, multiply by 1.609.

[c] The Turtle Mountains NNL is not included in this table. This area was in the viewshed of the original proposed SEZ and was included in the corresponding table in the Draft Solar PEIS; however, this area is not within the viewshed of the proposed SEZ as revised.

[d] Percentage of total feature acreage or road length viewable.

[e] Source: BLM (2012b).

essentially industrial in appearance and would contrast strongly with the surrounding, mostly natural-appearing landscape.

The elimination of acreage within the SEZ reduces the visual contrast associated with solar facilities as seen both within the SEZ and from some surrounding lands in both daytime and nighttime views. The reductions in visual contrast resulting from the boundary changes can be summarized as follows:

- Within the Riverside East SEZ: Contrasts experienced by viewers in the northwest portion of the SEZ would be substantially reduced because of the elimination of 43,439 acres (176 km^2) of land within the SEZ; however,

strong contrasts still would result in the remaining developable area. There would be a reduction in contrasts in the central portion of the SEZ between the Palen-McCoy WA and I-10 and in scattered areas east of the McCoy Mountains because of the designation of non-development lands in the SEZ.

- CDCA: Since the SEZ is located within the CDCA, only a minimal reduction in contrasts would occur because of the elimination of portions of the SEZ; solar development within the SEZ still would cause strong contrasts for viewers within portions of the CDCA.

- Joshua Tree NP: A reduction in contrasts would occur in those areas of the NP located adjacent to the SEZ as proposed in the Draft Solar PEIS. With the elimination of acreage in the northwest portion of the SEZ, expected contrast levels would likely decrease from "strong" to "moderate" for viewpoints in the northeastern portion of the NP; expected contrast levels would be lower but still "strong" for most viewpoints in the southeastern portions of the National Park.

- Bradshaw Scenic Highway: A very slight reduction in contrasts would be anticipated because of the designation of non-development lands in the SEZ; however, solar development within the SEZ still would cause minimal to strong contrasts, depending on viewer location on the trail.

- Big Maria Mountains WA: A very slight reduction in contrasts would be anticipated because of the designation of non-development lands in the SEZ; however, solar development within the SEZ still would cause strong contrasts.

- Chuckwalla Mountains WA: A slight reduction in contrasts would be anticipated because of the elimination of portions of the SEZ and designation of some lands as non-developable; solar development within the SEZ still would cause strong contrasts.

- Imperial Refuge WA: A reduction in contrasts would be anticipated; however, solar development within the SEZ still would cause minimal contrasts.

- Joshua Tree WA: See above for Joshua Tree NP.

- Little Chuckwalla Mountains WA: A slight reduction in contrasts would be anticipated because of the elimination of areas within the central portion of the SEZ that are labeled as non-developable; however, solar development still would cause moderate to strong contrasts, depending on viewer location within the WA.

- Orocopia Mountains WA: A very slight reduction in contrast would be anticipated; however, solar development within the SEZ still would cause weak contrasts.

- Palen-McCoy WA: A reduction in contrasts would be anticipated in those areas located along the western border of the WA, because of the elimination of portions of the SEZ. However, solar development would still cause strong contrasts in those areas of the WA immediately adjacent to the central portion of the SEZ. Weak to strong contrasts still would be anticipated in other portions of the WA, depending on viewer location.

- Palo Verde Mountains WA: No reduction in contrasts would be anticipated; however, solar development within the SEZ still would cause weak to moderate contrasts, depending on viewer location within the WA.

- Rice Valley WA: No reduction in contrasts would be anticipated; however, solar development within the SEZ still would cause strong contrasts.

- Sheephole Valley WA: No reduction in contrasts would be anticipated; solar development within the SEZ still would cause minimal to weak contrasts.

- Trigo Mountains WA: A reduction in contrasts would be anticipated; however, solar development within the SEZ still would cause weak contrasts.

- Turtle Mountains WA: A reduction in contrasts would be anticipated; however, solar development within the SEZ still would cause weak contrasts.

- Cibola NWR: A reduction in contrasts would be anticipated; however, solar development within the SEZ still would cause weak contrasts.

- Imperial NWR: A reduction in contrasts would be anticipated; however, solar development within the SEZ still would cause minimal contrasts.

- Turtle Mountains NNL: The Turtle Mountains NNL is no longer within the viewshed; expected contrast levels would be lowered from "weak" to "none."

- Corn Springs ACEC: A slight reduction in contrasts would be anticipated because of the elimination of portions of the SEZ and designation of some lands as non-developable; solar development within the SEZ still would cause minimal (within the canyon) to strong contrasts (outside the canyon).

- Turtle Mountains ACEC: A reduction in contrasts would be anticipated; however, solar development within the SEZ still would cause weak contrasts.

- I-10: A reduction in contrasts would occur in that portion of the interstate located adjacent to the central portion of the SEZ because of the identification of areas as non-developable. Solar development in areas of the SEZ along the remainder of the interstate would still cause strong contrasts.

- State Route 177: A reduction in contrasts would occur along this route in those areas adjacent to portions of the SEZ that were eliminated, from about 2 mi (3.2 km) south of Joshua Tree NP northward. Solar development within the SEZ still would cause strong contrasts to State Route 177, especially for those areas just north of I-10.

- Blythe: No reduction in contrasts would be anticipated; however, solar development would still cause moderate to strong contrasts.

- East Blythe: No reduction in contrasts would be anticipated; however, solar development within the SEZ still would cause moderate to strong contrasts.

- Ehrenberg: No reduction in contrasts would be anticipated; solar development within the SEZ still would cause weak to moderate contrasts.

- Palo Verde: No reduction in contrasts would be anticipated; solar development within the SEZ still would cause weak to moderate contrasts.

- Ripley: No reduction in contrasts would be anticipated; solar development within the SEZ still would cause moderate to strong contrasts.

- Cibola, Arizona: No reduction in contrasts would be anticipated; solar development within the SEZ still would cause weak contrasts.

- Desert Center (including Lake Tamarisk): A reduction in contrasts would occur because of the elimination of portions of the SEZ; however, solar development within the SEZ still would cause strong contrasts due to the proximity of the community to the SEZ.

In addition to those areas evaluated within the Draft Solar PEIS, the following areas also may potentially be affected by solar development within the SEZ:

- Colorado River Corridor SRMA: Expected contrast levels would be "weak to moderate" for certain areas in the SRMA in the gap between the Mule Mountains and the Big Maria Mountains, with no contrast expected for other portions of the SRMA.

- La Posa Destination SRMA: Expected contrast levels would be "weak." The SRMA is located approximately 15 mi (241 km) east of the SEZ.

Table 9.4.14.2-2 provides the acreage of these areas that would be visible within the 650-ft (198.1-m) viewshed.

TABLE 9.4.14.2-2 Additional Selected Potentially Affected Sensitive Visual Resources within a 25-mi (40-km) Viewshed of the Proposed Riverside East SEZ as Revised, Assuming a Target Height of 650 ft (198.1 m)

Feature Type	Feature Name (Total Acreage)[a]	Feature Area or Linear Distance within 650.0-ft (198.1-m) Viewshed[c]		
		Visible within 5 mi[b]	Visible Between	
			5 and 15 mi	15 and 25 mi
SRMAs	Colorado River Corridor (240,578 acres)	294 acres (0%)	103,620 acres (43%)	33,639 acres (14%)
	La Posa Destination (362,523 acres)	0 acres	0 acres	8,872 acres (2%)

[a] To convert acres to km^2, multiply by 0.004047.

[b] To convert mi to km, multiply by 1.609.

[c] Percentage of total feature acreage or road length viewable.

9.4.14.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on visual resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. While application of the programmatic design features would reduce potential visual impacts somewhat, the degree of effectiveness of these design features can only be assessed at the site- and project-specific level. Given the large scale, reflective surfaces, and strong regular geometry of utility-scale solar energy facilities and the lack of screening vegetation and landforms within the SEZ viewshed, siting the facilities away from sensitive visual resource areas and other sensitive viewing areas would be the primary means of mitigating visual impacts. The effectiveness of other visual impact mitigation measures generally would be limited.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, the following SEZ-specific design feature for visual resources has been identified:

- Special visual impact mitigation should be considered for solar development on lands in the SEZ within areas west of Township 005S and Range 017E and north of Township 006S and Range 016E, as well as north of Sections 26, 27, 28, and 29 of Township 005S and Range 017E. These areas are visible from and in close proximity to Joshua Tree NP and the Palen-McCoy WA, and thus have a higher potential to cause visual impacts on the National Park and the WA. The BLM has identified these lands as potential high visual sensitivity areas, where solar development is subject to additional SEZ-specific

mitigation that will be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis. These lands are shown in Figure 9.4.1.1-2.

9.4.15 Acoustic Environment

9.4.15.1 Affected Environment

The developable area of the proposed Riverside East SEZ was reduced from 202,896 acres (821.1 km^2) to 147,910 acres (598.6 km^2). With the change in the proposed boundaries, distances to some of the noise receptors are greater than in the Draft Solar PEIS. The employee residences at Eagle Mountain Pumping Station are now 3 mi (5 km) from the SEZ boundary. Distances to other sensitive receptors remain the same as in the Draft Solar PEIS.

9.4.15.2 Impacts

9.4.15.2.1 Construction

With the reduction in the developable area of the Riverside East SEZ, the updated noise impacts presented in this Final Solar PEIS will be the same or less than those in the Draft Solar PEIS and, except as noted below for wildlife impacts in specially designated areas, the conclusions presented in the Draft Solar PEIS remain valid.

On the basis of comments received and recent references as applicable, this Final Solar PEIS used an updated approximate significance threshold of 55 dBA corresponding to the onset of adverse physiological impacts (Barber et al. 2010) to update the analysis of potential noise impacts on terrestrial wildlife in areas of special concern. As a result of this updated significance threshold, the assessment of impacts has been updated as follows. Noise levels at several specially designated areas adjacent to the SEZ could be about 74 dBA, a level above the updated significance threshold. The estimated noise level at the receptor about 1,700 ft (520 m) from the SEZ boundary is about 55 dBA. Accordingly, noise from construction in the proposed Riverside East SEZ could adversely affect wildlife in a small area in several specially designated areas for a short time period when construction activities would occur near the SEZ boundary adjacent to the specially designated areas. However, noise levels of about 35 dBA in Joshua Tree NP are lower than this threshold. In addition, as discussed in Section 5.10.2 of the Draft Solar PEIS and this Final Solar PEIS, there is the potential for other effects to occur at lower noise levels (Barber et al. 2011). Considering the approximate significance threshold of 55 dBA and the potential for impacts at lower noise levels, impacts on terrestrial wildlife from construction noise would have to be considered on a project-specific basis, including consideration of site-specific background levels and hearing sensitivity for site-specific terrestrial wildlife of concern.

Construction would cause some unavoidable but localized short-term noise impacts on neighboring communities, particularly for activities occurring near the western and eastern

boundaries of the proposed Riverside East SEZ boundaries, close to the nearby residences. No adverse vibration impacts are anticipated from construction activities, including from pile driving for dish engines.

9.4.15.2.2 Operations

With the decrease in developable area of the proposed SEZ, the updated noise estimates in this Final Solar PEIS are the same as or less than those in the Draft Solar PEIS, except as noted below for impacts from TES and dish engine facilities near residences or in specially designated areas.

Parabolic Trough and Power Tower

As stated above under construction impacts, for this Final Solar PEIS an updated approximate significance threshold of 55 dBA was used to evaluate potential noise impacts on terrestrial wildlife in areas of special concern. For TES operations, estimated daytime and nighttime noise levels at the boundary of the specially designated areas adjacent to the SEZ are about 51 and 61 dBA, respectively. Estimated noise levels within a distance of 0.5 mi (0.8 km) from the SEZ exceed the threshold level during nighttime hours. Thus, noise from operations of a parabolic trough or power tower facility equipped with TES in the proposed Riverside East SEZ could affect wildlife in some portions of the nearby specially designated areas adjacent to the SEZ. However, a predicted nighttime noise level of about 47 dBA would not exceed the threshold level in Joshua Tree NP. In addition, as discussed in Section 5.10.2 of the Draft Solar PEIS and this Final Solar PEIS, there is the potential for other effects to occur at lower noise levels (Barber et al. 2011). With the approximate significance threshold of 55 dBA and the potential for impacts at lower noise levels, impacts on terrestrial wildlife from a parabolic trough or power tower facility equipped with TES would have to be considered on a project-specific basis, including site-specific background levels and hearing sensitivity for site-specific terrestrial wildlife of concern. These noise levels could be audible and affect soundscapes in Joshua Tree NP.

Dish Engines

Potential noise impacts were remodeled for dish engine technologies to account for the updated SEZ boundaries. The reduction in developable area of the proposed Riverside East SEZ by about 27% would reduce the number of dish engines by a similar percentage. However, even with this reduction, noise levels within 3 mi (5 km) of the SEZ boundary could still exceed the Riverside County standard level of 45 dBA daytime L_{eq} for rural environments. In addition, if dish engines were located near the western or eastern boundaries close to nearby residences, this could result in noise levels above the Riverside County standard and the EPA guideline levels, and could have corresponding adverse noise impacts on residents there. Noise from dish engines might be masked by background noise if a receptor is located near noisy background sources,

such as highways. However, noise from dish engines would have considerable impacts on receptors with low background noise levels.

For a dish engine facility, the highest noise levels at the boundary of specially designated areas adjacent to the SEZ would be about 62 dBA and still could exceed the updated approximate significance threshold at 0.3 mi (0.5 km). Thus, noise from an operating dish engine facility in the proposed Riverside East SEZ could affect wildlife in some portions of the nearby specially designated areas. Noise levels at Joshua Tree NP, which is located about 1.8 mi (2.9 km) from the SEZ, would not exceed the threshold. As discussed in Section 5.10.2 of this Final Solar PEIS, there is the potential for other effects to occur at lower noise levels (Barber et al. 2011). With the approximate significance threshold of 55 dBA and the potential for impacts at lower noise levels, noise impacts on terrestrial wildlife from a dish engine facility would have to be considered on a project-specific basis, including site-specific background levels and hearing sensitivity for site-specific terrestrial wildlife of concern. These noise levels could be audible and affect soundscapes in Joshua Tree NP.

Changes in the proposed SEZ boundaries would not alter the discussions of vibration, transformer and switchyard noise, and corona discharge presented in the Draft Solar PEIS. Noise impacts from these sources would be minimal to negligible.

9.4.15.2.3 Decommissioning and Reclamation

The discussion in the Draft Solar PEIS remains valid. Decommissioning and reclamation activities would be of short duration, and their potential noise impacts would be moderate and temporary. Similarly, potential vibration impacts on surrounding communities and vibration-sensitive structures during decommissioning of any solar facility would be lower than those during construction and thus minimal.

9.4.15.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce noise impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide some protection from noise impacts.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes in the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for noise were identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

9.4.16 Paleontological Resources

9.4.16.1 Affected Environment

Data provided in the Draft Solar PEIS remain valid, with the following updates:

- The BLM Regional Paleontologist may have additional information regarding the paleontological potential of the SEZ and be able to update the temporary assignment of PFYC Class 3b as used in the Draft Solar PEIS.

- The San Bernardino County Museum paleontologist also may have additional information regarding the potential of paleontological resources in the vicinity of the SEZ.

9.4.16.2 Impacts

The assessment provided in the Draft Solar PEIS remains valid. Impacts on paleontological resources are unknown, but the potential is high in the older alluvial fans and areas of alluvial valley deposits of the SEZ. However, a more detailed look at the geological deposits of the SEZ is needed to determine whether a paleontological survey is warranted.

9.4.16.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on paleontological resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Impacts would be minimized through the implementation of required programmatic design features, including a stop-work stipulation in the event that paleontological resources are encountered during construction, as described in Section A.2.2 of Appendix A.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for paleontological resources have been identified. Because the PFYC of the proposed Riverside East SEZ is Class 3b (unknown potential), paleontological surveys would be needed to identify those areas that may have significant paleontological resources; therefore, the need for and nature of any SEZ-specific design features will depend on the findings of future paleontological investigations. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

As additional information on paleontological resources (e.g., from regional paleontologists or from new surveys) becomes available, the BLM will post the data to the project Web site (http://solareis.anl.gov) for use by applicants, the BLM, and other stakeholders.

9.4.17 Cultural Resources

9.4.17.1 Affected Environment

Data provided in the Draft Solar PEIS remain valid, with the following updates:

- The Palen Solar Power Project identified a total of 39 new sites: 6 prehistoric and 33 historic. Prehistoric site types include fire-affected rock deposits, groundstone concentrations, and lithic scatters of flakes and tools. Historic site types include refuse deposits, World War II tank tracks, mining claims, survey markers, and a corral (BLM 2011b).

- The Blythe Solar Power Project identified 203 new sites: 24 prehistoric sites and 179 historic sites. Prehistoric site types include lithic scatters, prehistoric quarry sites, thermal features, and a pot drop. Historic sites include early twentieth century habitation sites, Desert Training Center/California–Arizona Maneuver Area (DTC/C-AMA) related sites, mining claims, historic roads, and refuse scatters (BLM 2010b).

- The Genesis Solar Power Project identified 50 new sites: 28 prehistoric sites, 20 historic sites, and 2 multicomponent sites. Prehistoric site types include ceramic scatters, trail segments, artifact scatters, temporary camps, rock clusters, and geoglyphs. Historic sites include refuse scatters, road segments, and a well (CEC 2010b). Since construction began, more recent sites also have been identified below the surface in areas previously surveyed.

- The Desert Sunlight Solar Project identified 419 total new sites: 285 historic sites, 121 prehistoric sites, 1 multicomponent site, and 12 sites of unknown temporal affiliation. Prehistoric site types include rock hearths, lithic scatters, and petroglyphs. Historic site types include quartz reductions, refuse scatters, DTC/C-AMA related sites, mining claims and prospectors pits, survey markers, and road segments (Denniston 2011).

- A Class I literature review was completed by SWCA Environmental Consultants (SWCA and University of Arizona 2011) for the original footprint of the Riverside East SEZ. The results of the records search do not reflect the results from the Palen, Blythe, Genesis, and Desert Sunlight Solar Power Projects, as discussed above, or any other recent investigations, and these projects are not counted in the survey totals. The results of the records search identified the following additional information:
  - At least 49 surveys have been conducted within the original boundary of the SEZ. Of these 49, at least 42 satisfy modern survey requirements. Approximately 10% of the SEZ has been surveyed to modern standards (50- to 66-ft [5- to 20-m] transects), but not necessarily within the last 10 years.

  - A total of 787 sites were identified during the records search: 291 prehistoric sites, 424 historic sites, 62 multicomponent sites, and 10 sites of unknown temporal affiliation. Site types listed in the Draft Solar PEIS remain valid.
  - A total of 277 additional sites were identified within 1 mi (1.6 km) of the SEZ: 102 prehistoric sites, 151 historic sites, 12 multicomponent sites, and 12 sites of unknown temporal affiliation. Site types listed in the Draft Solar PEIS remain valid.
  - A total of 16 previously recorded sites have been determined eligible for listing in the NHRP.
  - In total, 29 sites have received eligibility recommendations, however, without documented SHPO concurrence. Six sites have been recommended "eligible" by their recorders; two sites are within the SEZ and four sites are within 1 mi (1.6 km) of the SEZ boundary. The Eagle Mountain Pumping Plant was recommended eligible, but the California SHPO stated additional research was needed in order to concur with the determination. Nineteen of the sites that have been recommended "not eligible" are within the SEZ; four are within 1 mi (1.6 km) of the SEZ.

- Additional information may be available to characterize the area surrounding the proposed SEZ in the future (after the Final Solar PEIS is completed), as follows:
  - Results of a Class II stratified random sample survey of 5,948 acres (24.1 km^2), or roughly 5% of the revised footprint of the SEZ. Areas of interest, such as dune areas and along washes, as determined through the Class I review, have been incorporated in the survey design and sampling strategy. Some subsurface testing of dune and/or colluvium areas should be considered in the sampling strategies for future surveys. The Class II survey is being conducted by the BLM to meet its ongoing Section 110 responsibilities under the NHPA. The objectives of the Class II surveys currently under contract are to reliably predict the density, diversity, and distribution of archaeological sites within each SEZ in Arizona, California, and Nevada and create sensitivity zones based on projected site density, complexity, likely presence of human burials, and/or other tribal concerns. The BLM will continue to request funding to support additional Class II sample inventories in the SEZ areas.
  - Recordation of trail segments in full to assist in better understanding of cultural landscapes.
  - NRHP evaluation of all newly recorded resources, as well as for previously recorded resources that have not yet been evaluated.
  - Continuation of government-to-government consultation as described in Section 2.4.3 of the Supplement to the Draft Solar PEIS and IM 2012-032 (BLM 2011k), including follow-up to recent ethnographic studies with tribes not included in the original studies to determine whether those tribes have similar concerns.

9.4.17.2 Impacts

As stated in the Draft Solar PEIS, direct impacts on significant cultural resources could occur in the proposed Riverside East SEZ. The proposed SEZ falls within the boundaries of the DTC/C-AMA, which contains scattered resources related to General Patton's training area. The southern end of the Salt Song Trail and portions of the Cocomaricopa and *Xam Kwatchan* Trails fall within the Riverside East SEZ, and the Mule Mountain, Alligator Rock, Palen Dry Lake ACECs are all adjacent to the proposed SEZ (see Section 9.4.17 in the Draft Solar PEIS).

As a result of the Class I literature review and review of the final project reports for the Palen, Blythe, Genesis, and Desert Sunlight Solar Projects, the following new impact was identified:

- Approximately 1,775 sites are located in or within 1 mi (1.6 km) of the original footprint of the proposed Riverside East SEZ and could be affected by development. NRHP eligibility of the majority of these sites is unknown at this time; thus the magnitude of impact (i.e., whether it constitutes an adverse effect) cannot be ascertained until eligibility determinations are made and the California SHPO concurs with those determinations.

9.4.17.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on cultural resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Programmatic design features assume that the necessary evaluations, surveys, and consultations will occur. If any of the sites located in or adjacent to the proposed SEZ are found to meet the eligibility criteria for listing in the NRHP, they will be subject to the programmatic design features regarding eligible sites as described in Section A.2.2 of Appendix A.

On the basis of the impact analysis completed for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, the following SEZ-specific design features have been identified:

- Consultation efforts should include discussions on significant archaeological sites and traditional cultural properties and on sacred sites and trails with views of the proposed SEZ, such as the Salt Song, Cocomaricopa, and *Xam Kwatchan* Trails, which connect spiritual landscapes and sacred sites in the area. The possibility of discovering human burials in the vicinity of the proposed Riverside East SEZ should also be discussed. Tribal participation in the Section 106 process will take place according to the Solar PA, including opportunities for tribal input regarding inventory design and treatment decisions and procedures for inadvertent discoveries during construction and operations.

- Significant resources clustered in specific areas, such as those surrounding Ford Dry Lake or within the DTC/C-AMA area, which retain sufficient integrity, should be avoided.

- Monitoring is recommended in sand sheet and colluvium environments similar to those in which buried sites were recently discovered during construction of the Genesis Solar development.

- Because the proposed Riverside East SEZ is located adjacent to or near six ACECs, it is possible that the ACECs could be subject to an increase in human and vehicle traffic. Potential construction vehicle corridors should be discussed prior to development of the proposed SEZ in order avoid possible impacts on historic resources within these ACECs and to determine alternative roads or paths to the development area.

Additional SEZ-specific design features would be determined in consultation with the California SHPO, local BLM offices, and affected tribes and would depend on the findings of future investigations. Some SEZ-specific design features may be established through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

9.4.18 Native American Concerns

9.4.18.1 Affected Environment

Data provided in the Draft Solar PEIS and Supplement to the Draft remain valid with the following updates:

- No new affected tribal cultural properties or landscapes were identified in the Class I literature review (SWCA and University of Arizona 2011). However, the Big Pine Paiute Tribe has expressed opposition to development within the Riverside East SEZ because it contains culturally sensitive areas.

- Government-to-government consultation will continue; potential topics to be discussed include the Prehistoric Trail Network Cultural Landscape/Historic District, which includes the Salt Song Trail, the *Xam Kwatcan* Trail, and the Cocomaricopa Trail; effects of workers and increased traffic on sacred sites; the loss of culturally important plants; the use and availability of water and the contamination of groundwater; ecological segmentation; important natural landscape features, such as the Big Marias, Coxcomb Mountains, Eagle Mountain, Alligator Rock, Black Rock, Palen Dry Lake, Ford Dry Lake, McCoy Springs, and Corn Springs; and several nearby ACECs and NRHP-listed properties, such as the Blythe Intaglios and the Mule Tank Discontiguous Rock Art District.

9.4.18.2 Impacts

The description of potential concerns provided in the Draft Solar PEIS remains valid. The Agua Caliente, Quechan, and Chemehuevi Tribes have expressed concern over the potential visual effects and physical impacts on cultural resources and landscapes. During previous fast-track solar projects located within the proposed Riverside East SEZ, Native Americans identified Alligator Rock, the Palen Dry Lake shoreline, the South Chuckwalla Mountains Petroglyph District, McCoy Springs, Black Rock, and local ACECs (Alligator Rock, Palen Dry Lake, and Mule Mountains ACECs) as important landscape features within 15 mi (24 km) of the SEZ. Tribes also have expressed specific concerns about the Salt Song and Cocomaricopa Trails (see Section 9.4.18.2 of the Draft Solar PEIS). Although specific landscapes and resources within the Riverside East SEZ were not identified by Native American tribes through an ethnographic study, government-to-government consultation efforts, or public comment, beliefs and concerns identified by representatives of other tribes throughout the Solar PEIS study area are potentially a concern in this SEZ as well. Expected impacts on Native Americans from solar energy development within the Riverside East SEZ are divided into three major categories: impacts on spiritual and culturally important landscapes, impacts on prehistoric and historic archaeological sites, and impacts on local native resources.

Tribal representatives from the nine tribes that participated in the ethnographic studies believe the cultural resources found within the landscape are important in helping them understand their past, present, and future. In almost all cases, Tribal representatives would like to see SEZs managed as spiritual cultural landscapes, with areas of special significance formally nominated as traditional cultural properties (SWCA and University of Arizona 2011). All nine tribes have expressed concern for the possible destruction of native plant and animal habitat and the potential decrease in water resources as a result of solar development, and these resources will likely be a concern within the Riverside East SEZ as well (see Section 9.4.18.2 of the Draft Solar PEIS). In addition, when large swaths of traditional plants have been noted within or near an SEZ, Tribal representatives have made specific requests to consider co-managing these natural resources with the BLM (SWCA and University of Arizona 2011). Solar energy facilities cover large tracts of ground, and even if the implementation of design features is taken into account, it is unlikely that avoidance of all resources would be possible. However, as discussed in Sections 9.4.10 and 9.4.11 of this Final Solar PEIS, impacts on some plant and animal resources are expected to be minimal, because there is an abundance of similar plant and animal habitat in the area. Moderate impacts are expected on some special status species, such as cholla cactus (*Cylindropuntia* spp.), bighorn sheep (*Ovis canadensis*), Gambel's quail (*Callipepla gambelii*), white-winged doves (*Zenaida asiatica*), mourning dove (*Zenaida macrocura*), desert tortoise (*Gopherus agassizii*), and Mojave rattlesnake (*Crotalus* spp.).

9.4.18.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on Native American concerns are described in Section A.2.2 of Appendix A of this Final Solar PEIS. For example, impacts would be minimized through the avoidance of sacred sites, water sources, and tribally important plant and animal species. Programmatic design features require that the necessary

surveys, evaluations, and consultations occur. The tribes would be notified regarding the results of archaeological surveys, and they would be immediately contacted upon the discovery of Native American human remains and associated cultural items.

On the basis of the impact analysis conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features to address Native American concerns have been identified. However, monitoring is recommended in sand sheet and colluvium environments similar to those in which buried sites were recently discovered during construction of a solar development. The need for and nature of SEZ-specific design features would be determined during government-to-government consultation with affected tribes as part of the process of preparing parcels for competitive offer and subsequent project-specific analysis. Potentially significant sites, landscapes, and resources within the vicinity of the Riverside East SEZ, including the Prehistoric Trail Network Cultural Landscape/Historic District, which includes the Salt Song Trail, the *Xam Kwatcan* Trail, and the Cocomaricopa Trail; culturally important plants and animals; Big Maria Mountains; Coxcomb Mountains; Eagle Mountain; Black Rock; Palen Dry Lake, Ford Dry Lake, and McCoy Springs; local ACECs, including Palen Lake, Mule Tank, Corn Springs, and Alligator Rock; and NRHP-listed properties, such as the Blythe Intaglios, the Mule Tank Discontiguous Rock Art District, and the South Chuckwalla Mountains Petroglyph District, should be considered and discussed during consultation.

9.4.19 Socioeconomics

9.4.19.1 Affected Environment

Although the boundaries of the Riverside East SEZ have been reduced compared to the boundaries in the Draft Solar PEIS, the socioeconomic ROI, the area in which site employees would live and spend their wages and salaries and into which any in-migration would occur, includes the same counties and communities as described in the Draft Solar PEIS, meaning that no updates to affected environment information given in the Draft Solar PEIS are required.

9.4.19.2 Impacts

Socioeconomic resources in the ROI around the SEZ could be affected by solar energy development through the creation of direct and indirect employment and income, the generation of direct sales and income taxes, SEZ acreage rental and capacity payments to the BLM, the in-migration of solar facility workers and their families, and impacts on local housing markets and community service employment. The impact assessment provided in the Draft Solar PEIS remains valid, with the following updates.

9.4.19.2.1 Solar Trough

Construction

Total construction employment impacts in the ROI (including direct and indirect impacts) from the use of solar trough technologies would be up to 15,633 jobs (Table 9.4.19.2-1). Construction activities would constitute 1.3% of total ROI employment. A solar development would also produce $927.3 million in income. Direct sales taxes would be $41.2 million; direct income taxes, $18.9 million.

Given the scale of construction activities and the low likelihood that the entire construction workforce in the required occupational categories would be available in the ROI, construction of a solar facility means that some in-migration of workers and their families from outside the ROI would be required, with up to 2,229 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) would mean that the impact of solar facility construction on the number of vacant rental housing units is not expected to be large, with up to 770 rental units expected to be occupied in the ROI. This occupancy rate would represent 1.6% of the vacant rental units expected to be available in the ROI.

In addition to the potential impact on housing markets, in-migration would also affect community service employment (education, health, and public safety). An increase in such employment would be required to meet existing levels of service in the ROI. Accordingly, up to 21 new teachers, 4 physicians, and 5 public safety employees (career firefighters and uniformed police officers) would be required in the ROI. These increases would represent 0.1% of total ROI employment expected in these occupations.

Operations

Total operations employment impacts in the ROI (including direct and indirect impacts) of a full build-out of the SEZ using solar trough technologies would be 8,501 jobs (Table 9.4.19.2-1). Such a solar development would also produce $308.8 million in income. Direct sales taxes would be $0.6 million; direct income taxes $8.1 million. On the basis of fees established by the BLM (BLM 2010c), acreage rental payments would be $46.2 million, and solar generating capacity payments, at least $155.5 million.

Operation of a solar facility likely would require some in-migration of workers and their families from outside the ROI, with up to 657 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility operation on the number of vacant owner-occupied housing units is not expected to be large, with up to 408 owner-occupied units expected to be occupied in the ROI.

TABLE 9.4.19.2-1 ROI Socioeconomic Impacts Assuming Full Build-out of the Proposed Riverside East SEZ as Revised with Solar Trough Facilities

Parameter	Maximum Annual Construction Impacts[a]	Annual Operations Impacts[b]
Employment (no.)		
Direct	5,232	5,155
Total	15,633	8,501
Income[c]		
Total	927.3	308.8
Direct state taxes[c]		
Sales	41.2	0.6
Income	18.9	8.1
BLM payments[c]		
Rental	NA[d]	46.2
Capacity fee[e]	NA	155.5
In-migrants (no.)	2,229	657
Vacant housing[f] (no.)	770	408
Local community service employment		
Teachers (no.)	21	6
Physicians (no.)	4	1
Public safety (no.)	5	1

[a] Construction impacts were based on the development at the site in a single year; it was assumed that several facilities with a combined capacity of up to 1,800 MW (corresponding to 9,000 acres [36 km^2] of land disturbance) could be built.

[b] Operations impacts were based on full build-out of the site, producing a total output of 23,666 MW.

[c] Values are reported in $ million 2008.

[d] NA = not applicable.

[e] The BLM annual capacity payment was based on a fee of $6,570/MW, established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010c), assuming a solar facility with no storage capability and full build-out of the site. Projects with three or more hours of storage would generate higher payments, based on a fee of $7,884/MW.

[f] Construction activities would affect vacant rental housing; operations activities would affect vacant owner-occupied housing.

In addition to the potential impact on housing markets, in-migration would affect community service (health, education, and public safety) employment. An increase in such employment would be required to meet existing levels of service in the provision of these services in the ROI. Accordingly, up to six new teachers, one physician, and two public safety employees would be required in the ROI.

9.4.19.2.2 Power Tower

Construction

Total construction employment impacts in the ROI (including direct and indirect impacts) from the use of power tower technologies would be up to 6,227 jobs (Table 9.4.19.2-2). Construction activities would constitute 0.5% of total ROI employment. Such a solar development would also produce $369.3 million in income. Direct sales taxes would be less than $16.4 million; direct income taxes, $7.5 million.

Given the scale of construction activities and the low likelihood that the entire construction workforce in the required occupational categories would be available in the ROI, construction of a solar facility means that some in-migration of workers and their families from outside the ROI would be required, with up to 888 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility construction on the number of vacant rental housing units is not expected to be large, with up to 307 rental units expected to be occupied in the ROI. This occupancy rate would represent 0.6% of the vacant rental units expected to be available in the ROI.

In addition to the potential impact on housing markets, in-migration would affect community service (education, health, and public safety) employment. An increase in such employment would be required to meet existing levels of service in the ROI. Accordingly, up to eight new teachers, one physician, and two public safety employees would be required in the ROI. These increases would represent less than 0.1% of total ROI employment expected in these occupations.

Operations

Total operations employment impacts in the ROI (including direct and indirect impacts) of a full build-out of the SEZ using power tower technologies would be 3,740 jobs (Table 9.4.19.2-2). Such a solar development would also produce $124.6 million in income. Direct sales taxes would be $0.1 million; direct income taxes $4.2 million. On the basis of fees established by the BLM (BLM 2010c), acreage rental payments would be $46.2 million, and solar generating capacity payments, at least $86.4 million.

TABLE 9.4.19.2-2 ROI Socioeconomic Impacts Assuming Full Build-out of the Proposed Riverside East SEZ as Revised with Power Tower Facilities

Parameter	Maximum Annual Construction Impacts[a]	Annual Operations Impacts[b]
Employment (no.)		
Direct	2,084	2,662
Total	6,227	3,740
Income[c]		
Total	369.3	124.6
Direct state taxes[c]		
Sales	16.4	0.1
Income	7.5	4.2
BLM payments[c]		
Rental	NA[d]	46.2
Capacity[e]	NA	86.4
In-migrants (no.)	888	339
Vacant housing[f] (no.)	307	211
Local community service employment		
Teachers (no.)	8	3
Physicians (no.)	1	1
Public safety (no.)	2	1

[a] Construction impacts were based on the development at the site in a single year; it was assumed that several facilities with a combined capacity of up to 1,000 MW (corresponding to 9,000 acres [36 km^2] of land disturbance) could be built.

[b] Operations impacts were based on full build-out of the site, producing a total output of 13,148 MW.

[c] Values are reported in $ million 2008.

[d] NA = not applicable.

[e] The BLM annual capacity payment was based on a fee of $6,570/MW, established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010c), assuming a solar facility with no storage capability and full build-out of the site. Projects with three or more hours of storage would generate higher payments, based on a fee of $7,884/MW.

[f] Construction activities would affect vacant rental housing; operations activities would affect vacant owner-occupied housing.

Operation of a solar facility likely would require some in-migration of workers and their families from outside the ROI, with up to 339 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) would mean that the impact of solar facility operation on the number of vacant owner-occupied housing units is not expected to be large, with up to 211 owner-occupied units expected to be required in the ROI.

In addition to the potential impact on housing markets, in-migration would affect community service (education, health, and public safety) employment. An increase in such employment would be required to meet existing levels of service in the ROI. Accordingly, up to four new teachers, one physician, and one public safety employee would be required in the ROI.

9.4.19.2.3 Dish Engine

Construction

Total construction employment impacts in the ROI (including direct and indirect impacts) from the use of dish engine technologies would be up to 2,531 jobs (Table 9.4.19.2-3). Construction activities would constitute 0.2% of total ROI employment. Such a solar development would also produce $150.1 million in income. Direct sales taxes would be less than $6.7 million; direct income taxes, $3.1 million.

Given the scale of construction activities and the low likelihood that the entire construction workforce in the required occupational categories would be available in the local workforce, construction of a solar facility means that some in-migration of workers and their families from outside the ROI would be required, with up to 361 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility construction on the number of vacant rental housing units is not expected to be large, with up to 125 rental units expected to be occupied in the ROI. This occupancy rate would represent 0.3% of the vacant rental units expected to be available in the ROI.

In addition to the potential impact on housing markets, in-migration would affect community service (education, health, and public safety) employment. An increase in such employment would be required to meet existing levels of service in the ROI. Accordingly, up to three new teachers, one physician, and one public safety employee would be required in the ROI. These increases would represent less than 0.1% of total ROI employment expected in these occupations.

TABLE 9.4.19.2-3 ROI Socioeconomic Impacts Assuming Full Build-out of the Proposed Riverside East SEZ as Revised with Dish Engine Facilities

Parameter	Maximum Annual Construction Impacts[a]	Annual Operations Impacts[b]
Employment (no.)		
Direct	847	2,587
Total	2,531	3,634
Income[c]		
Total	150.1	121.1
Direct state taxes[c]		
Sales	6.7	0.1
Income	3.1	4.1
BLM payments[c]		
Rental	NA[d]	46.2
Capacity[e]	NA	86.4
In-migrants (no.)	361	330
Vacant housing[f] (no.)	125	205
Local community service employment		
Teachers (no.)	3	3
Physicians (no.)	1	1
Public safety (no.)	1	1

[a] Construction impacts were based on the development at the site in a single year; it was assumed that several facilities with a combined capacity of up to 1,000 MW (corresponding to 9,000 acres [36 km^2] of land disturbance) could be built.

[b] Operations impacts were based on full build-out of the site, producing a total output of 13,148 MW.

[c] Values are reported in $ million 2008.

[d] NA = not applicable.

[e] The BLM annual capacity payment was based on a fee of $6,570/MW, established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010c), assuming a solar facility with no storage capability and full build-out of the site. Projects with three or more hours of storage would generate higher payments, based on a fee of $7,884/MW.

[f] Construction activities would affect vacant rental housing; operations activities would affect vacant owner-occupied housing.

Operations

Total operations employment impacts in the ROI (including direct and indirect impacts) of a full build-out of the SEZ using dish engine technologies would be 3,634 jobs (Table 9.4.19.2-3). Such a solar development would also produce $121.1 million in income. Direct sales taxes would be $0.1 million; direct income taxes, $4.1 million. On the basis of fees established by the BLM (BLM 2010c), acreage rental payments would be $46.2 million, and solar generating capacity payments, at least $86.4 million.

Operation of a dish engine solar facility likely would require some in-migration of workers and their families from outside the ROI, with up to 330 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility operation on the number of vacant owner-occupied housing units is not expected to be large, with up to 205 owner-occupied units expected to be required in the ROI.

In addition to the potential impact on housing markets, in-migration would affect community service employment (education, health, and public safety). An increase in such employment would be required to meet existing levels of service in the ROI. Accordingly, up to four new teachers, one physician, and one public safety employee would be would be required in the ROI.

9.4.19.2.4 Photovoltaic

Construction

Total construction employment impacts in the ROI (including direct and indirect impacts) from the use of PV technologies would be up to 1,181 jobs (Table 9.4.19.2-4). Construction activities would constitute 0.1% of total ROI employment. Such a solar development would also produce $70.0 million in income. Direct sales taxes would be less than $3.1 million; direct income taxes, $1.4 million.

Given the scale of construction activities and the low likelihood that the entire construction workforce in the required occupational categories would be available in the ROI, construction of a solar facility means that some in-migration of workers and their families from outside the ROI would be required, with up to 168 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility construction on the number of vacant rental housing units is not expected to be large, with up to 58 rental units expected to be occupied in the ROI. This occupancy rate would represent 0.1% of the vacant rental units expected to be available in the ROI.

TABLE 9.4.19.2-4 ROI Socioeconomic Impacts Assuming Full Build-out of the Proposed Riverside East SEZ as Revised with PV Facilities

Parameter	Maximum Annual Construction Impacts[a]	Annual Operations Impacts[b]
Employment (no.)		
Direct	395	258
Total	1,181	363
Income[c]		
Total	70.0	12.1
Direct state taxes[c]		
Sales	3.1	<0.1
Income	1.4	0.4
BLM payments[c]		
Rental	NA[d]	46.2
Capacity[e]	NA	69.1
In-migrants (no.)	168	33
Vacant housing[f] (no.)	58	20
Local community service employment		
Teachers (no.)	2	0
Physicians (no.)	0	0
Public safety (no.)	0	0

[a] Construction impacts were based on the development at the site in a single year; it was assumed that several facilities with a combined capacity of up to 1,000 MW (corresponding to 9,000 acres [36 km^2] of land disturbance) could be built.

[b] Operations impacts were based on full build-out of the site, producing a total output of 13,148 MW.

[c] Values are reported in $ million 2008.

[d] NA = not applicable.

[e] The BLM annual capacity payment was based on a fee of $5,256/MW, established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010c), assuming full build-out of the site.

[f] Construction activities would affect vacant rental housing; operations activities would affect owner-occupied housing.

In addition to the potential impact on housing markets, in-migration would affect community service (education, health, and public safety) employment. An increase in such employment would be required to meet existing levels of service in the ROI. Accordingly, up to two new teachers would be required in the ROI. This increase would represent less than 0.1% of total ROI employment expected in this occupation.

Operations

Total operations employment impacts in the ROI (including direct and indirect impacts) of a full build-out of the SEZ using PV technologies would be 363 jobs (Table 9.4.19.2-4). Such a solar development would also produce $12.1 million in income. Direct sales taxes would be less than $0.1 million; direct income taxes, less than $0.4 million. On the basis of fees established by the BLM (BLM 2010c), acreage rental payments would be $46.2 million, and solar generating capacity payments, at least $69.1 million.

Operation of a PV solar facility likely would require that some in-migration of workers and their families from outside the ROI, with up to 33 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility operation on the number of vacant owner-occupied housing units is not expected to be large, with up to 20 owner-occupied units expected to be required in the ROI.

No new community service employment would be required to meet existing levels of service in the ROI.

9.4.19.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce socioeconomic impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will reduce the potential for socioeconomic impacts during all project phases.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features to address socioeconomic impacts have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

9.4.20 Environmental Justice

9.4.20.1 Affected Environment

The data presented in the Draft Solar PEIS have changed because of the change in boundaries of the proposed Riverside East SEZ. The affected environment information for environmental justice presented in the Draft Solar PEIS has also changed, as reflected in the following discussion.

The data in Table 9.4.20.1-1 show the minority and low-income composition of the total population located within a 50-mi (80-km) radius of the proposed Riverside East SEZ based on 2000 Census data and CEQ guidelines (CEQ 1997). Individuals identifying themselves as Hispanic or Latino are included in the table as a separate entry. However, because Hispanics can be of any race, this number also includes individuals who also identify themselves as being part of one or more of the population groups listed in the table.

A large number of minority and low-income individuals are located in the 50-mi (80-km) area around the boundary of the SEZ. Within the 50-mi (80-km) radius in Arizona, 20.4% of the population is classified as minority, while 13.2% is classified as low-income. The number of minority individuals does not exceed 50% of the total population in the area, and the number of minority individuals does not exceed the state average by 20 percentage points or more; that is, there is no minority population in the SEZ area based on 2000 Census data and CEQ guidelines. The number of low-income individuals does not exceed the state average by 20 percentage points or more and does not exceed 50% of the total population in the area; that is, there are no low-income populations in the SEZ.

Within the 50-mi (80-km) radius in California, 65.6% of the population is classified as minority, while 22.8% is classified as low-income. While the number of minority individuals does not exceed the state average by 20 percentage points or more, the number of minority individuals exceeds 50% of the total population in the area; that is, there is a minority population in the SEZ as a whole area based on 2000 Census data and CEQ guidelines. The number of low-income individuals does not exceed the state average by 20 percentage points or more and does not exceed 50% of the total population in the area; that is, there are no low-income populations in the SEZ as a whole.

Figures 9.4.20.1-1 and 9.4.20.1-2 show the locations of the minority and low-income population groups, respectively, within the 50-mi (80-km) radius around the boundary of the SEZ.

In the California portion of the 50-mi (80-km) radius around the SEZ, more than 50% of the population is classified as minority in block groups located in the City of Blythe itself and

TABLE 9.4.20.1-1 Minority and Low-Income Populations within the 50-mi (80-km) Radius Surrounding the Proposed Riverside East SEZ as Revised

Parameter	Arizona	California
Total population	59,311	218,940
White, non-Hispanic	47,211	75,253
Hispanic or Latino	8,212	123,642
Non-Hispanic or Latino minorities	3,888	20,045
One race	3,104	17,031
Black or African American	331	11,262
American Indian or Alaskan Native	2,395	2,067
Asian	306	2,933
Native Hawaiian or Other Pacific Islander	43	429
Some other race	29	340
Two or more races	784	3,014
Total minority	12,100	143,687
Low-income	7,700	43,406
Percentage minority	20.4	65.6
State percentage minority	24.5	40.5
Percentage low-income	13.2	22.8
State percentage low-income	13.9	14.2

Sources: U.S Bureau of the Census (2009a,b).

to the immediate west and southwest of the city; in the western part of the county in the vicinity of Desert Hot Springs; in Imperial County in the vicinity of Calipatria and Westmoreland; and in the Fort Yuma Indian Reservation in the Colorado River valley. Block groups with a minority population which is more than 20 percentage points higher than the state average are located in the City of Blythe, to the immediate west of the city, and in the western portions of the 50-mi (80-km) radius in the vicinity of Indio and Coachella. In the Arizona portion of the 50-mi (80-km) radius, more than 50% of the population is classified as minority in block groups located in the Colorado River Indian Reservation, in the City of Parker, and to the east of the Colorado River, south of Blythe.

Census block groups in the 50-mi (80-km) radius in California that have more than 50% of their population classified as low-income are located in the vicinity of the City of Twentynine Palms, in the western portion of Riverside County, and in Arizona, to the northeast of Yuma. Census block groups in California where the low-income population is more than 20 percentage points higher than the state average are located in the City of Blythe, in the western portion of

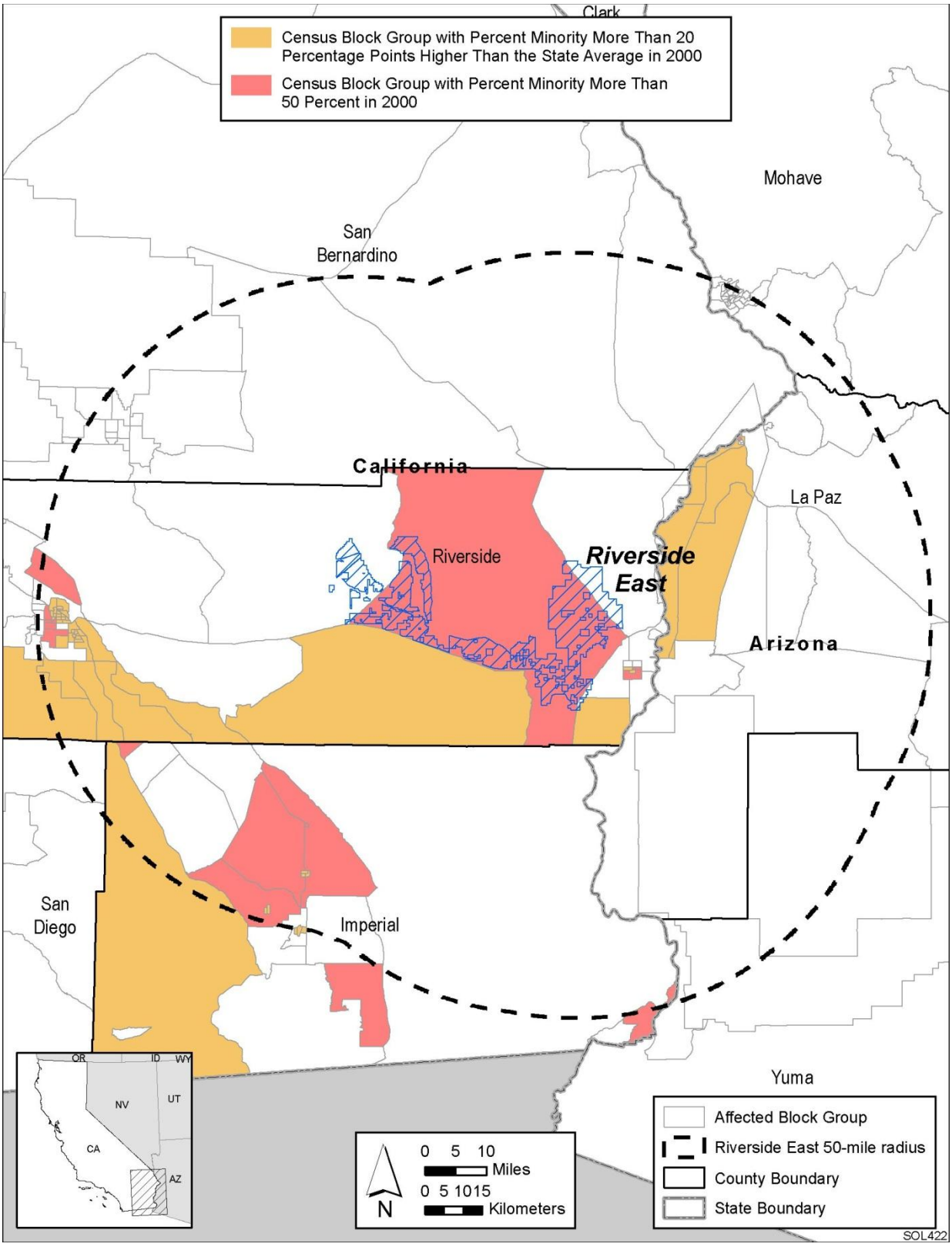

FIGURE 9.4.20.1-1 Minority Population Groups within the 50-mi (80-km) Radius Surrounding the Proposed Riverside East SEZ as Revised

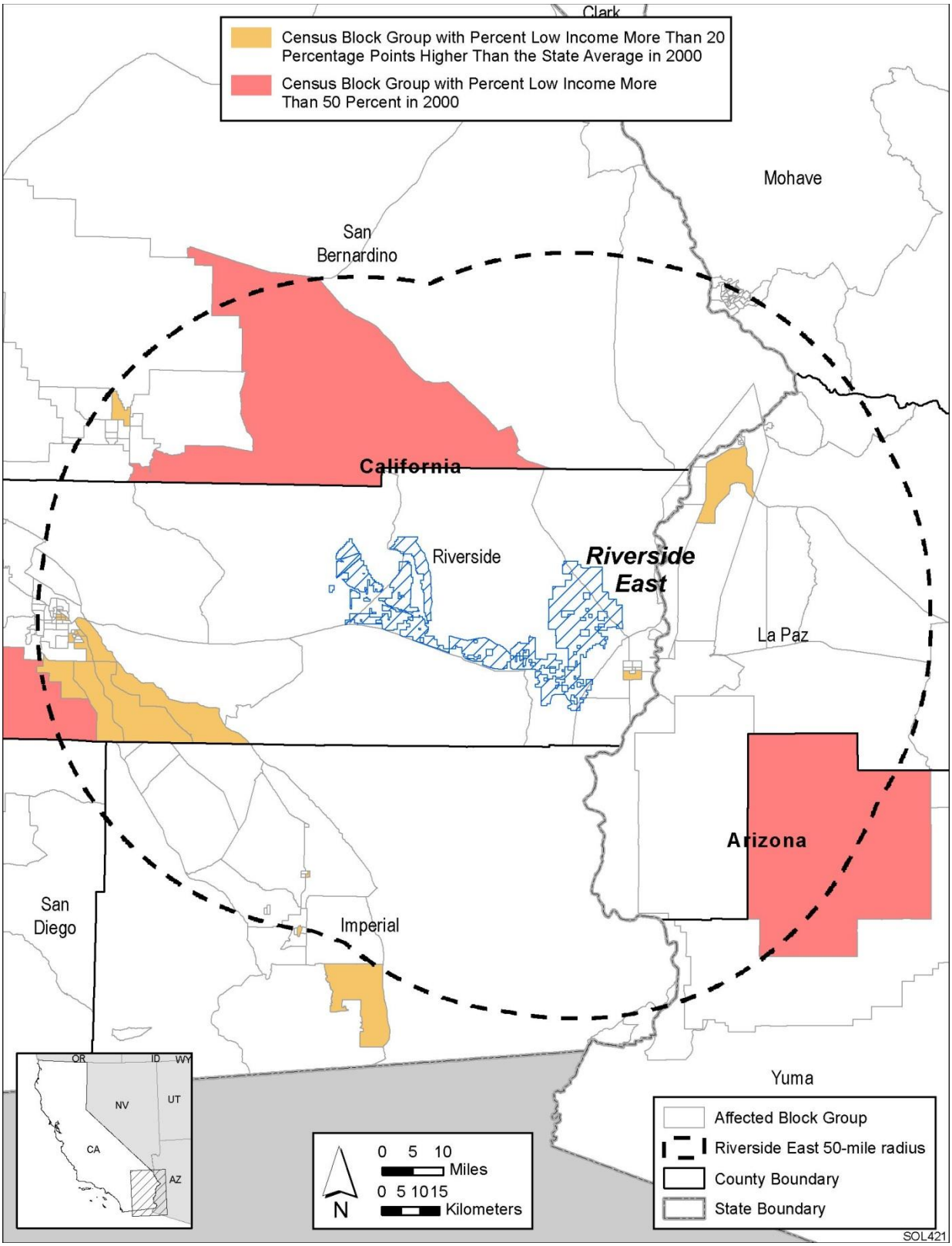

FIGURE 9.4.20.1-2 Low-Income Population Groups within the 50-mi (80-km) Radius Surrounding the Proposed Riverside East SEZ as Revised

the county, in the Colorado River Indian Reservation, and in the vicinity of the City of Victorville.

9.4.20.2 Impacts

Environmental justice concerns common to all utility-scale solar energy facilities are described in detail in Section 5.18 of the Draft Solar PEIS. The potentially relevant environmental impacts associated with solar facilities within the proposed Riverside East SEZ include noise and dust during the construction of solar facilities; noise and EMF effects associated with solar project operations; the visual impacts of solar generation and auxiliary facilities, including transmission lines; access to land used for economic, cultural, or religious purposes; and effects on property values as areas of concern that might potentially affect minority and low-income populations.

Potential impacts on low-income and minority populations could be incurred as a result of the construction and operation of solar facilities involving each of the four technologies. Although impacts are likely to be small, there are minority populations defined by CEQ guidelines (see Section 9.4.20.1 of the Draft Solar PEIS) within the 50-mi (80-km) radius around the boundary of the SEZ; that is, any adverse impacts of solar projects could disproportionately affect minority populations. Because there are no low-income populations within the 50-mi (80-km) radius, according to CEQ guidelines, there would be no impacts on low-income populations.

9.4.20.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce potential environmental justice impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will reduce the potential for environmental justice impacts.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for environmental justice have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

9.4.21 Transportation

9.4.21.1 Affected Environment

The reduction in developable area of the SEZ does not change the information on affected environment for transportation provided in the Draft Solar PEIS.

9.4.21.2 Impacts

As stated in the Draft Solar PEIS, primary transportation impacts in the SEZ are anticipated to come from commuting worker traffic. I-10, a regional traffic corridor, would experience small impacts for single projects that may have up to 1,000 daily workers, with an additional 2,000 vehicle trips per day (maximum). Such an increase is less than 10% of the current traffic on I-10. However, the exits on I-10 might experience moderate impacts with some congestion. Local road improvements would be necessary in any portion of the SEZ near I-10 that might be developed in order not to overwhelm the local roads near any site access point(s). Similarly, any access to portions of the SEZ using State Route 177 or U.S. 95 may require road improvements on those roads and on local access roads.

If up to three large projects with approximately 1,000 daily workers each were under development simultaneously within the SEZ, an additional 6,000 vehicle trips per day could be added to I-10 in the vicinity of the SEZ, assuming ride-sharing was not implemented and all access to the SEZs was funneled through I-10 (i.e., no workers commuted to work via State Route 177 from State Route 62 to the north or via local roads from U.S. 95 to the east). This would be an increase of about 25% of the current average daily traffic on most segments of I-10 near the SEZ, and could have moderate impacts on traffic flow during peak commute times. The extent of the problem would depend on the relative locations of the projects within the SEZ, where the worker populations originate, and work schedules. Affected exits on I-10 would experience moderate impacts with some congestion. Local road improvements would be necessary in any portion of the SEZ near I-10 that might be developed in order not to overwhelm the local roads near any site access point(s). Similarly, any access to portions of the SEZ that use State Route 177 or U.S. 95 may also require road improvements on State Route 177 or U.S. 95 and local access roads, depending on the percentage of worker commuter traffic using those routes.

Solar development within the SEZ would affect public access along OHV routes designated open and available for public use. Several routes are designated as open within the proposed SEZ. Although open routes crossing areas granted ROWs for solar facilities could be redesignated as closed (see Section 5.5.1 of the Draft Solar PEIS), a programmatic design feature has been included under Recreation (Section A.2.2.6.1 of Appendix A) that requires consideration of replacement of lost OHV route acreage and of access across and to public lands.

9.4.21.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce transportation impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. The programmatic design features, including local road improvements, multiple site access locations, staggered work schedules, and ride-sharing, will all provide some relief to traffic congestion on local roads leading to the SEZ. Depending on the location of solar facilities within the SEZ, more specific access locations and local road improvements could be implemented.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features to address transportation impacts in the proposed Riverside East SEZ have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

9.4.22 Cumulative Impacts

The analysis of potential impacts in the vicinity of the proposed Riverside East SEZ presented in the Draft Solar PEIS is still generally applicable for this Final Solar PEIS, although the impacts would decrease because the size of the developable area of the proposed SEZ has been reduced from 202,896 acres (821 km^2) to 147,910 acres (599 km^2). In addition, several previously pending projects have been dropped, and some additional projects within 50 mi (80 km) of the SEZ have been proposed, started construction, or begun operations. The following sections include an update to the information presented in the Draft Solar PEIS regarding cumulative effects for the proposed Riverside East SEZ.

9.4.22.1 Geographic Extent of the Cumulative Impact Analysis

The geographic extent of the cumulative impact analysis has not changed. The extent varies on the basis of the nature of the resource being evaluated and the distance at which the impact may occur (e.g., air quality impacts may have a greater geographic extent than visual resources impacts). Most of the lands around the Riverside East SEZ are administered by the BLM, the NPS, or the DoD; the BLM administers approximately 58% of the lands within a 50-mi (80-km) radius of the SEZ.

9.4.22.2 Overview of Ongoing and Reasonably Foreseeable Future Actions

The Draft Solar PEIS included three other proposed SEZs in Southern California. Two of these, Iron Mountain and Pisgah, have been removed from further consideration.

Two projects (the Blythe and Genesis Solar Projects) totaling 1,250 MW and about 9,000 acres have been authorized within the proposed Riverside East SEZ. Although the Blythe project has an authorized ROW application, it will require additional case processing and environmental review to consider a post-authorization request to change technology to PV. The Desert Sunlight 550-MW PV facility is an additional authorized project that is under construction adjacent to the western boundary of the SEZ. There are seven additional solar project applications pending in the SEZ.

There are approximately 13 pending ROW applications for solar facilities within 50 mi (80 km) of the Riverside East SEZ (including pending applications within the SEZ) that could generate up to about 6,400 MW on public lands in Arizona and California (see the list in

Appendix B of this Final Solar PEIS). However, these applications are in various stages of approval, and for many, environmental assessments have not been completed. Since the release of the Draft Solar PEIS, only three additional projects (the Desert Harvest Solar Project, the McCoy Solar Energy Project, and the Quartzsite Solar Energy Project, all described below), have advanced to consideration as reasonably foreseeable actions (because there are firm near-term plans and environmental documentation has been completed). As of the end of October 2011, the other pending solar applications were not considered reasonably foreseeable future actions.

The list of reasonably foreseeable future actions near the proposed Riverside East SEZ has been updated and is presented in Table 9.4.22.2-1. These projects are grouped into two categories: (1) actions that relate to energy production and distribution (Section 9.4.22.2.1), and (2) other ongoing and reasonably foreseeable actions, including those related to mining and mineral processing, grazing management, transportation, recreation, water management, and conservation (Section 9.4.22.2.2). Together, these actions have the potential to affect human and environmental receptors within the geographic range of potential impacts over the next 20 years.

9.4.22.2.1 Energy Production and Distribution

Reasonably foreseeable future actions related to energy production and distribution and other major actions within a 50-mi (80-km) radius from the center of the Riverside East SEZ, which includes portions of Riverside, San Bernardino, and Imperial Counties in California, and La Paz and Yuma Counties in Arizona, are identified in Table 9.4.22.2-1. Projects listed in the tables are shown in Figure 9.4.22.2-1.

Projects not previously described in the Draft Solar PEIS are described in the following sections.

Solar Energy Projects

Solar energy projects not previously described in the Draft Solar PEIS are summarized below. The locations of these projects are shown in Figure 9.4.22.2-1.

Desert Harvest Solar Project. enXco proposes to construct and operate a 100-MW PV solar electric generation facility on approximately 930 acres (3.8 km^2) of BLM land. The site is located about 6 mi (10 km) north of the community of Desert Center, California (BLM 2011e).

Electricity will be transmitted by using either the First Solar Desert Sunlight generator tie-line or a planned Red Bluff Substation that would connect to Southern California Edison's regional transmission grid.

Rio Mesa Solar Electric Generating Facility. BrightSource Energy, Inc., proposes to construct and operate three 250-MW power tower plants on approximately 5,750 acres

TABLE 9.4.22.2-1 Ongoing and Reasonably Foreseeable Future Actions Related to Energy Development and Distribution and Other Major Actions near the Proposed Riverside East SEZ as Revised[a,b]

Description	Status	Resources Affected	Primary Impact Location
Solar Energy Projects on Private or County Lands			
Rice Solar Energy, 150-MW power tower facility, 5,750 total acres[c] (on private land, transmission ROW crosses BLM-administered land)	**FEIS June 10, 2011[d]; ROD December 20, 2011; approved December 8, 2011[e]**	Land use, visual, terrestrial habitats, wildlife, groundwater	About 15 mi[f] north of the eastern part of Riverside East SEZ, adjacent to and south of State Route 62
Rio Mesa Solar Electric Generating Facility, three 250-MW power towers (each 750 ft), 5,750 acres (mostly private land)	**CA Energy Commission accepts Application for Certification December 14, 2011[g]; construction 2013–2016**	**Land use, visual, terrestrial habitats, wildlife, groundwater**	**About 13 mi southwest of Blythe**
Tessera Solar, up to 500-MW dish engine facility (on county land)	**Appears to be cancelled or on hold**	Land use, visual, terrestrial habitats, wildlife, groundwater	Riverside County
Approved and Priority Solar Energy Projects on BLM-Administered Land [h]			
First Solar Desert Sunlight (CACA 48649), 550-MW PV facility, **4,165 BLM acres**	**FEIS April 15, 2011[i]; ROD August 10, 2011; under construction**	Land use, visual, terrestrial habitats, wildlife, groundwater	**Adjacent to the northwestern part of the Riverside East SEZ**
Solar Millennium Palen Solar Project (CACA 48810), **484-MW originally planned as parabolic trough facility, converting to PV, 3,119 BLM acres**	**FEIS May 13, 2011[j]; BLM decision on hold pending receipt of revised data**	Land use, visual, terrestrial habitats, wildlife, groundwater	West-central part of Riverside East SEZ
Solar Millennium Blythe Solar Project (CACA 48811), **1,000-MW originally planned as parabolic trough facility, converting to PV, 7,025 total acres**	**ROD October 22, 2010; construction started February 2011; construction on hold pending receipt of revised data[k]**	Land use, visual, terrestrial habitats, wildlife, groundwater	Eastern part of the Riverside East SEZ

TABLE 9.4.22.2-1 (Cont.)

Description	Status	Resources Affected	Primary Impact Location
Approved and Priority Solar Energy Projects on BLM-Administered Land[h] (Cont.)			
Genesis Solar Energy Project (**formerly** NextEra Genesis Ford Dry Lake Solar Project (CACA 48880), 250-MW parabolic trough facility, 4,640 acres[k]	**ROD November 4, 2010[l]; Notice to Proceed August 24, 2011[m]; under construction**	Land use, visual, terrestrial habitats, wildlife, groundwater	**Western** part of the Riverside East SEZ
Desert Harvest Solar Project (CACA 49491), 100-MW PV, 930 BLM acres	**NOI September 15, 2011[n]**	**Land use, visual, terrestrial habitats, wildlife**	**Western part of the Riverside East SEZ**
McCoy Solar Energy Project (CACA 48728), 750-MW PV, 7,754 BLM acres	**NOI August 29, 2011**	**Land use, visual, terrestrial habitats, wildlife**	**Eastern part of the Riverside East SEZ**
Quartzsite Solar Energy Project (AZA 34 666), 100-MW power tower, 1,500 BLM acres	**NOI January 1, 2010; DEIS November 10, 2011**	**Land use, visual, terrestrial habitats, wildlife**	**20 mi east of the Riverside East SEZ**
Renewable Energy Projects			
Orresource Geothermal (CACA 6217, CACA 6218, CACA 17568)	Ongoing	Land use, terrestrial habitats, visual	About 50 mi south of the Riverside East SEZ, within the East Mesa Known Geothermal Resource Area
Geothermal Power Project (CACA 18092X)	Authorized	Land use, terrestrial habitats, visual	About 50 mi south of the Riverside East SEZ, within the East Mesa Known Geothermal Resource Area
Geothermal Power Project (CACA 29853X)	Authorized	Land use, terrestrial habitats, visual	About 45 mi southwest of the Riverside East SEZ
Transmission and Distribution			
Blythe Energy Project Transmission Line Modifications	Under way	Land use, terrestrial habitats, visual	Riverside County

TABLE 9.4.22.2-1 (Cont.)

Description	Status	Resources Affected	Primary Impact Location
Transmission and Distribution (Cont.)			
Devers to Palo Verde No. 2	**ROD July 14, 2011[o]**	Land use, terrestrial habitats, visual	Riverside County
Other Projects			
Cadiz Valley Dry Year Supply Project	**Draft EIR December 2011[p]**	Disturbed areas, terrestrial habitats along railroad ROW	Areas adjacent to ARZC Railroad ROW in southern portion of the Iron Mountain SEZ, about 40 mi north of the Riverside East SEZ
Proposed West Chocolate Mountains Renewable Energy Evaluation Area	**DEIS June 2011[q]**	Land use, visual, terrestrial habitats, wildlife, groundwater	About 20 mi southwest of the Riverside East SEZ
Eagle Crest Hydroelectric Plant **1,300-MW Pumped Storage**	**DEIS December 2010[r]**	Land use, surface water	Eagle Mountain Mine, near northwest portion of the Riverside East SEZ
Grazing Lease Rice Valley Allotment	EA Issuance of 10-year Grazing Lease, January 2007 (CA-660-EA06-55)	Land use, surface water	Riverside County

[a] Projects in later stages of agency environmental review and project development.

[b] Projects with status changed from that given in the Draft Solar PEIS are shown in bold text.

[c] To convert acres to km^2, multiply by 0.004047.

[d] See Western (2011) for details.

[e] See DOI (2011) for details.

[f] To convert mi to km, multiply by 1.6093.

[g] See CEC (2011a) for details.

[h] See BLM (2012a) for details.

[i] See BLM (2011a) for details.

[j] See BLM (2011b) for details.

[k] See BLM (2011c) for details.

[l] BLM (2010d) for details.

Footnotes continued on next page.

TABLE 9.4.22.2-1 (Cont.)

[m] See BLM (2011d) for details. The approved area for the Genesis Solar Energy project is 1,950 acres (BLM 2011i).

[n] See BLM (2011e) for details.

[o] See BLM (2011f) for details.

[p] See Santa Margarita Water District (2011) for details.

[q] See BLM (2011g) for details.

[r] See FERC (2010) for details.

(23.3 km^2) of mostly private land owned by the Metropolitan Water District of Southern California with some BLM land. The site is about 13 mi (21 km) southwest of the City of Blythe, near the southeastern portion of the Riverside East SEZ (BrightSource 2011; CEC 2011b).

Each plant will utilize a solar power boiler at the top of a 750-ft (230-m) tower, surrounded by approximately 85,000 heliostat (mirror) fields that focus the solar energy on the solar power boiler. Each plant will also have five natural gas–fired auxiliary boilers operating in parallel with the solar field during partial load conditions, during daily start-up of power generation equipment, and nighttime preservation. A 119-acre (0.8-km^2) common area will include administration, control, and maintenance facilities and a substation servicing all three plants.

Electricity will be transmitted on a common generator tie-line from the switchyard to Southern California Edison's Colorado River Substation, approximately 9.7 mi (15.5 km) northwest of the site.

The proposed facility would have an estimated peak water requirement of 400 ac-ft/yr (494,000 m^3/yr) during the construction period and 260 ac-ft/yr (321,000 m^3/yr) thereafter for operation. The water would be drawn from on-site wells. Construction of the facility will require more than 2,500 workers at the peak of construction. Operation and maintenance will employ about 150 workers.

McCoy Solar Energy Project. McCoy Solar, LLC, proposes to construct and operate an up to 750-MW PV solar facility. Unit 1 will be 250 MW; Unit 2 will provide the additional 500 MW; and construction will begin following commercial operation of Unit 1. The proposed site is located on about 7,700 acres (31.2 km^2) of BLM land in the Riverside East SEZ (but the Solar Plant Site will utilize only about 5,363 acres (22.8 km^2) of BLM land) and 470 acres (1.9 km^2) of private land. The site is about 13 mi (21 km) northwest of the City of Blythe (BLM 2011j).

The project substation, approximately 14 acres (0.057 km^2), will be connected to Southern California Edison's Colorado River Substation.

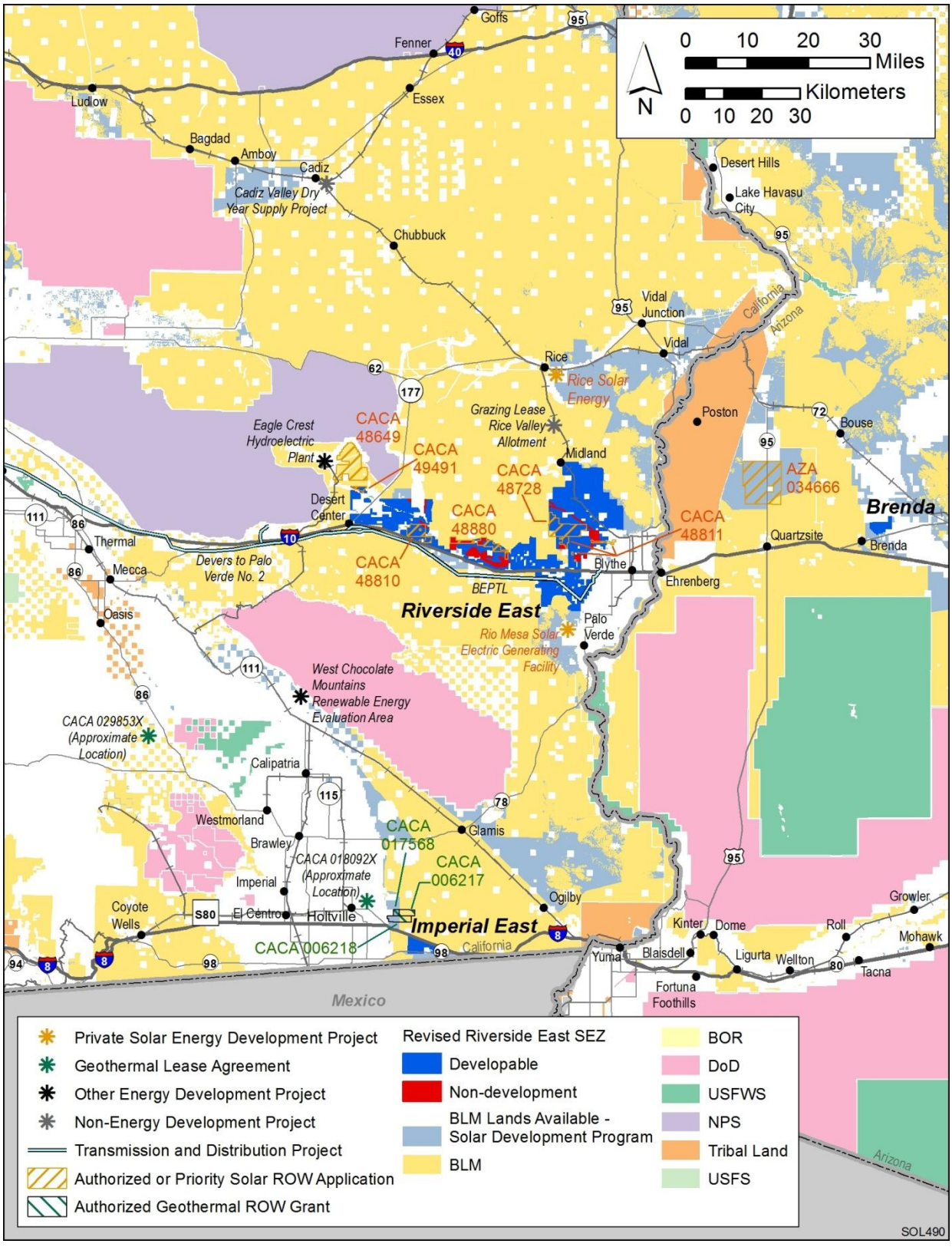

FIGURE 9.4.22.2-1 Locations of Existing and Reasonably Foreseeable Renewable Energy Projects on Public Land within a 50-mi (80-km) Radius of the Proposed Riverside East SEZ as Revised

Total water consumption during construction is estimated to be between 650 ac-ft (802,000 m^3) and 750 ac-ft (925,000 m^3). Water required for operation and maintenance is estimated to be 30 ac-ft/yr (37,000 m^3/yr). Water will be provided from on-site wells. Construction of the facility will require about 600 workers at the peak of construction. Operation and maintenance will employ up to 20 workers.

Quartzsite Solar Energy Project. Quartzsite Solar, LLC, proposes to construct a 100-MW power tower solar facility. The proposed site is located on about 1,500 acres (6.1 km^2) of BLM land, approximately 10 mi (16 km) north of Quartzsite, Arizona, and 20 mi (32 km) east of the Riverside East SEZ. The facility will interconnect to Western's transmission system through the existing Bouse–Kofa transmission line (BLM 2011h).

The plant will utilize a solar power boiler at the top of a 538-ft (164-m) tower, surrounded by approximately 17,500 heliostat (mirror) fields that focus the solar energy on the solar power boiler. The receiver would be composed of tube panels through which liquid salt flows.

The cooling system will be dry cooling. Approximately 1,000 ac-ft (1,233,000 m^3) of water will be required during the first year of construction. An estimated 150 ac-ft (185,000 m^3) would be required during the remaining construction. Approximately 200 ac-ft/yr (250,000 m^3) of water would be required during operation. Water will be provided from on-site wells. Construction of the facility will require about 400 to 500 workers at the peak of construction. Operation and maintenance will employ up to 47 workers.

Wind, Geothermal, and Transmission and Distribution Projects

With the exception of the following transmission line project, no substantive changes have been made to the projects listed in the Draft Solar PEIS.

Devers to Palo Verde No.2 Transmission Line Project. The BLM and the USFS have issued a ROD to authorize an amended ROW grant and USFS special use easement for the construction, operation, maintenance, and decommissioning of a 500-kV transmission line on an alignment that begins at the Colorado River Substation located near Blythe, California, and extends to the Devers Substation in Palm Springs, California, spanning 115 mi (185 mi). A portion of the line continues from the Devers Substation to the Valley Substation, located in unincorporated Romoland in Riverside County, spanning 41.6 mi (66.9 km) (BLM 2011f). Construction began in June 2011 (PUC 2011).

9.4.22.2.2 Other Actions

There is one addition to the projects listed in the Draft Solar PEIS.

Marine Corps Air Ground Combat Center Expansion

The U.S. Marine Corps proposes the establishment of a large-scale training range facility at the Marine Corps Air Ground Combat Center at Twentynine Palms, California, that would accommodate sustained, combined-arms, live-fire, and maneuver training for all elements of a Marine Expeditionary Brigade (MEB). To implement the proposed action, the Marine Corps would acquire additional land adjacent to the Combat Center, establish and modify military SUA above the proposed MEB-sized training range, and conduct the specified MEB training.

The proposed action includes the following:

- Acquisition of land contiguous to the existing Combat Center to provide a sufficient area for realistic MEB-sized sustained, combined-arms, live-fire, and maneuver training that meets at least a minimum threshold level of MEB training requirements within appropriate margins of safety;

- Modification and establishment of SUA to enable full integration of MEB-sized Aviation Combat Element operations and both air- and ground-delivered live-fire ordnance use within appropriate margins of safety; and

- Expanded training implemented as a full-scale MEB Exercise conducted twice per year for 24 continuous days each.

The proposed action is expected be implemented sometime in the 2014 to 2015 time frame. Construction of facilities or infrastructure would be minimal. The estimated increase in military and civilian personnel at the Combat Center would range from a low of 59 to a high of 77. During each proposed exercise, an estimated 10,000 to 15,000 Marines would reside at the existing Exercise Support Base within the Combat Center (Marine Corps 2011).

9.4.22.3 General Trends

The information on general trends presented in the Draft Solar PEIS remains valid.

9.4.22.4 Cumulative Impacts on Resources

Total disturbance in the proposed Riverside East SEZ over 20 years is assumed to be about 118,328 acres (478.8 km^2), or 80% of the developable area of the proposed SEZ. This development would contribute incrementally to the impacts from other past, present, and reasonably foreseeable future actions in the region, as described in the Draft Solar PEIS. Primary impacts from development in the Riverside East SEZ may include impacts on water quantity and quality, air quality, ecological resources such as habitat and species, cultural and visual resources, and specially designated lands.

Activities in the region that will contribute to cumulative impacts include four additional solar projects within the SEZ or within 50 mi (80 km) of the proposed Riverside East SEZ that were not known or considered foreseeable at the time the Draft Solar PEIS was prepared: the Desert Harvest Solar Project (100 MW), Rio Mesa Solar Electric Generating Facility (750 MW), McCoy Solar Energy Project (750 MW), and Quartzsite Solar Energy Project (100 MW). Two other reasonably foreseeable projects on BLM-administered lands will require additional case processing and environmental review prior to authorization to consider requests to change technology from CSP to PV (Blythe and Palen Solar Projects originally proposed as totaling almost 1,500 MW). The change in technology for these projects is expected to result in lower MW capacity and in lower water use. In addition, the expansion of the Marine Corps Air Ground Combat Center at Twentynine Palms, California, will represent further contributions to cumulative impacts in this region.

Authorized solar projects (the Desert Sunlight, Genesis, and Blythe projects) within and adjacent to the proposed Riverside East SEZ would have a combined capacity of 1,800 MW and encompass approximately 13,000 acres. The total capacity and land required for six additional reasonably foreseeable solar projects would be about 2,300 MW and 25,000 acres (101 km^2), respectively (see Table 9.4.22.2-1). In total, these reasonably foreseeable solar projects would affect about 38,000 acres (154 km^2). In addition, the proposed expansion of the Marine Corps Air Ground Combat Center would involve the acquisition of 167,971 acres (680 km^2) of federal, nonfederal, and state lands; potential take of 154 to 714 adult desert tortoises; and loss of access to and use of the majority of the Johnson Valley OHV Area (Marine Corps 2011).

However, the elimination of the nearby formerly proposed Iron Mountain SEZ from consideration means it will not be contributing to the cumulative impacts in the region. Also, because the technology for a substantial amount of the reasonably foreseeable development has been changed from CSP to PV, the projected water use impacts in the region are expected to be lower than those projected in the Draft Solar PEIS.

Overall, the incremental cumulative impacts associated with development in the proposed Riverside East SEZ during construction, operation, and decommissioning are expected to be about the same or less than those projected in the Draft Solar PEIS. This is because the size of the Riverside East SEZ has decreased by approximately 20%, thereby reducing the incremental contribution to cumulative impacts from the SEZ.

9.4.23 Transmission Analysis

The methodology for this transmission analysis is described in Appendix G of this Final Solar PEIS. This section presents the results of the transmission analysis for the Riverside East SEZ, including the identification of potential load areas to be served by power generated at the SEZ and the results of the DLT analysis. Unlike Sections 9.4.2 through 9.4.22, this section is not an update of previous analysis for the Riverside East SEZ; this analysis was not presented in the Draft Solar PEIS. However, the methodology and a test case analysis were presented in the Supplement to the Draft Solar PEIS. Comments received on the material presented in the

Supplement were used to improve the methodology for the assessment presented in this Final Solar PEIS.

The Riverside East SEZ represents the most complex case because of the SEZ's potential to generate a very large amount of solar power. On the basis of its size, the assumption of a minimum of 5 acres (0.02 km^2) of land required per MW, and the assumption of a maximum of 80% of the land area developed, the Riverside East SEZ is estimated to have the potential to generate 23,666 MW of marketable solar power at full build-out.

9.4.23.1 Identification and Characterization of Load Areas

The primary candidates for Riverside East SEZ load areas are the major surrounding cities. Figure 9.4.23.1-1 shows the possible load areas for the Riverside East SEZ and the estimated portion of their market that could be served by solar generation. With the very large amount of marketable power assumed to be generated at the proposed Riverside East SEZ, the convention of developing two cases (for sensitivity purposes) was not followed. Because of the wide dispersal of power to many load areas, the base case for this site does not contain a clear "primary market," or "primary pathway," that would offer logical exclusion criteria for creating a secondary solution. In addition, because there were significant challenges in identifying sufficient loads to satisfy the SEZ generation potential, introducing any artificial exclusion criteria would make it likely that the remaining candidate areas and pathways would not be able to fully distribute and absorb the SEZ's capacity.

As a result, only one load area group was modeled, as follows:

- Riverside County, San Bernardino–Riverside County load I, San Bernardino–Riverside County load II, Los Angeles, San Francisco Bay load I, San Francisco Bay load II, Sacramento, San Diego, and San Diego County, California; Yuma, Phoenix, and Tucson, Arizona; Las Cruces, Albuquerque, and Farmington, New Mexico; Denver, Colorado; Salt Lake City, Utah; El Paso, Dallas, Austin, and San Antonio, Texas; and Reno and Las Vegas, Nevada.

Figure 9.4.23.1-2 shows the transmission scheme considered for the Riverside East SEZ. The group provided for linking loads along alternative routes so that the SEZ's output of 23,666 MW could be fully allocated.

Table 9.4.23.1-1 summarizes the load area according to its associated transmission scheme and provides details on how the megawatt load was estimated.

9.4.23.2 Findings for the DLT Analysis

The DLT analysis approach assumes that the Riverside East SEZ will require all new construction for transmission lines (i.e., dedicated lines) and substations. The new transmission

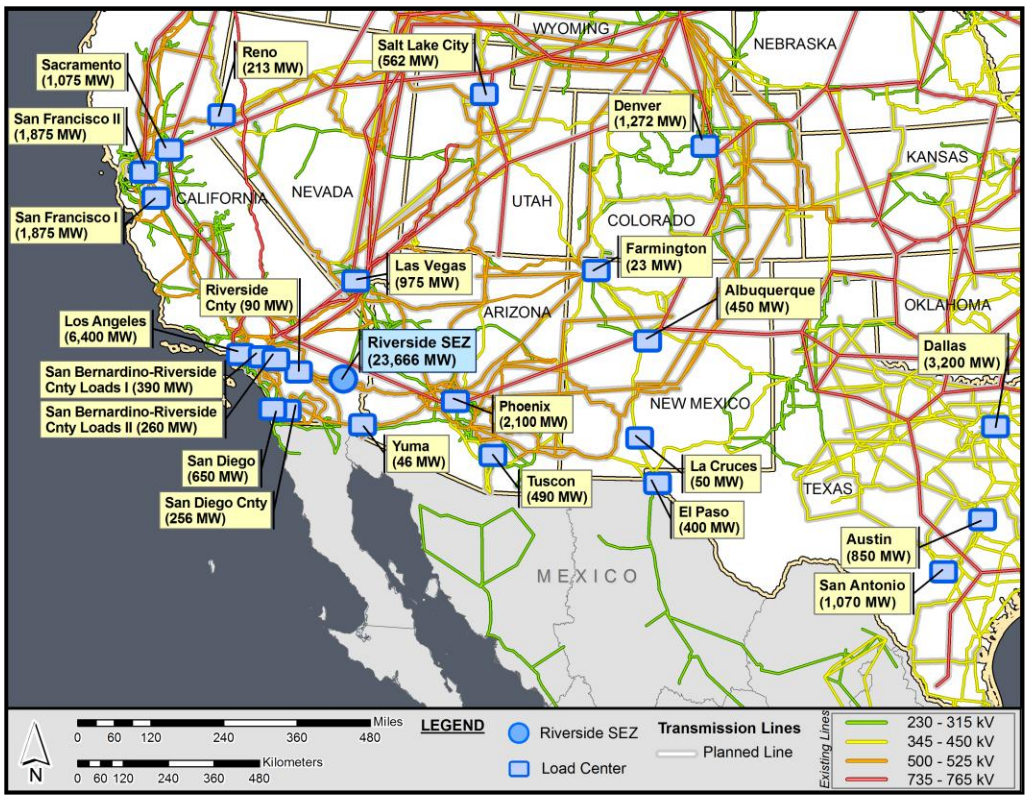

FIGURE 9.4.23.1-1 Location of the Proposed Riverside East SEZ and Possible Load Areas (Source for background map: Platts 2011)

lines(s) would directly convey the 23,666-MW output of the Riverside East SEZ to the prospective load areas for the proposed transmission scheme. The approach also assumes that all existing transmission lines in the WECC region are saturated and have little or no available capacity to accommodate the SEZ's output throughout the entire 10-year study horizon. Figure 9.4.23.1-2 displays the pathways that new dedicated lines might follow to distribute solar power generated at Riverside East SEZ via the identified transmission scheme described in Table 9.4.23.2-1. These pathways parallel existing 500-, 345-, 230-kV, and/or lower voltage lines. The intent of following existing lines is to avoid pathways that may be infeasible due to topographical limitations or other concerns.

For the first component of the transmission scheme presented here, new lines would be constructed to connect with Los Angeles (6,400 MW) and nearby counties (740 MW), the San Francisco Bay area (3,750 MW), Sacramento (1,075 MW), and Reno (213 MW), so that part of the 23,666-MW output of the Riverside East SEZ could be fully utilized (Figure 9.4.23.1-2). The second component of the scheme would require new transmission lines to Phoenix (2,100 MW) and Las Vegas (975 MW). The third component would serve the cities of Yuma (46 MW), San Diego County (256 MW), and San Diego (650 MW) in the southwest. The fourth component would require additional new lines to Tucson (490 MW), La Cruces (50 MW), Albuquerque (450 MW), Farmington (23 MW), Denver (1,272 MW), and Salt Lake City (562 MW). The fifth and final component would require new lines to El Paso (400 MW), Dallas (3,200 MW), Austin

FIGURE 9.4.23.1-2 Transmission Scheme for the Proposed Riverside East SEZ (Source for background map: Platts 2011)

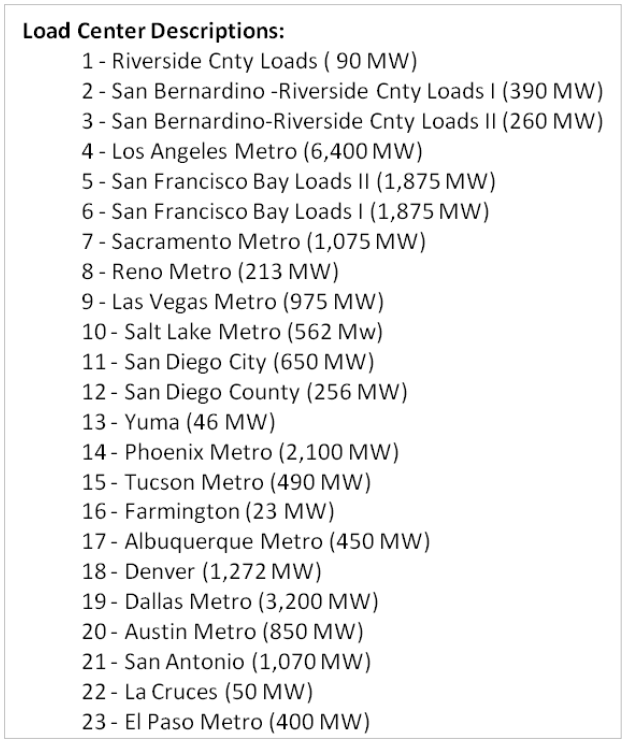

FIGURE 9.4.23.1-2 (Cont.)

(850 MW), and San Antonio (1,075 MW). In general, the transmission configuration options for each of the segments in each component were determined by using the line "loadability" curve in American Electric Power's *Transmission Facts* (AEP 2010). Appendix G documents the line options used for this analysis and describes how the load area groupings were determined.

Table 9.4.23.2-1 summarizes the distances to the various load areas over which new transmission lines would need to be constructed, as well as the assumed number of substations that would be required. One substation is assumed to be installed at each load area and an additional one at the SEZ. Thus, in general, the total number of substations per scheme is simply equal to the number of load areas associated with the scheme plus one. Substations at the load areas would consist of one or more step-down transformers, while the originating substation at the SEZ would consist of several step-up transformers. The originating substation would have a total rating of at least 23,666 MW (to match the plant's output), while the combined load substations would have a similar total rating of 23,666 MW. Where branching of the lines is required, a switching substation is assumed to be constructed at the appropriate junction. In general, switching stations carry no local load but are assumed to be equipped with switching gears (e.g., circuit breakers and connecting switches) to reroute power as well as, in some cases, with additional equipment to regulate voltage.

Table 9.4.23.2-2 provides an estimate of the total land area disturbed for construction of new transmission facilities under the scheme evaluated. The scheme presented is estimated to potentially disturb about 144,973 acres (587 km^2) of land.

TABLE 9.4.23.1-1 Candidate Load Area Characteristics for the Proposed Riverside East SEZ

Transmission Scheme	City/Load Area Name	Position Relative to SEZ	2010 Population[i]	Estimated Total Peak Load (MW)	Estimated Peak Solar Market (MW)
1	Riverside County load, California[a]	West	180,000	450	90
	San Bernardino–Riverside County load I, California[b]	West	780,000	1,950	390
	San Bernardino-Riverside County load II, California[c]	West	520,000	1,300	260
	Los Angeles, California[d]	West	12,800,000	32,000	6,400
	San Francisco Bay load II, California[e]	Northwest	3,750,000	9,375	1,875
	San Francisco Bay load I, California[f]	Northwest	3,750,000	9,375	1,875
	Sacramento, California[g]	Northwest	2,150,000	5,375	1,075
	Reno, Nevada[g]	Northwest	425,000	1,063	213
	Las Vegas, Nevada[g]	North	1,950,000	4,875	975
	Salt Lake City, Utah[g]	East	1,124,000	2,810	562
	San Diego, California[d]	Southwest	1,250,000	3,125	650
	San Diego County, California[h]	Southwest	514,000	1,284	256
	Yuma, Arizona[d]	Southwest	92,000	230	46
	Phoenix, Arizona[g]	East	4,200,000	10,500	2,100
	Tucson, Arizona[g]	Southwest	980,000	2,450	490
	Farmington, New Mexico[d]	Northeast	46,000	115	23
	Albuquerque, New Mexico[g]	Northeast	900,000	2,250	450
	Denver, Colorado[g]	Northeast	2,543,000	6,358	1,272
	Dallas, Texas[g]	East	6,400,000	16,000	3,200
	Austin, Texas[g]	East	1,700,000	4,250	850
	San Antonio, Texas[g]	East	2,140,000	5,350	1,070
	Las Cruces, New Mexico[d]	East	100,000	250	50
	El Paso, Texas[g]	East	800,000	2,000	400

[a] The Riverside County load area includes the communities of Indio, Cathedral City, and Palm Springs.

[b] The San Bernardino–Riverside County load I area includes the communities of Colton, Riverside, San Bernardino, Redlands, Highland, and Rialto.

[c] The San Bernardino–Riverside County load II area includes the communities of Fontana, Ontario, and Rancho Cucamonga.

[d] The load area represents the city named.

[e] The San Francisco Bay load II area is centered in San Jose and includes towns and cities within 3 mi to the north, 29 mi to the west, 33 mi to the northwest, 43 mi to the south, and 45 mi to the east.

[f] The San Francisco Bay load I area is centered in Oakland and includes towns and cities within 50 mi to the east of Oakland, 14 mi to the west, 40 mi to the north, and 15 mi to the southeast.

[g] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

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TABLE 9.4.23.1-1 (Cont.)

[h] The San Diego County load area includes the cities of Imperial Beach, Spring Valley, National City, Chula Vista, La Mesa, and El Cajon.

[i] City and metropolitan area population data for all loads except those in the San Francisco Bay loads are from 2010 Census data (U.S. Bureau of the Census 2010). Population data for the San Francisco Bay loads are from a combination of sources including U.S. Bureau of the Census (2010), Platts (2011), and Onboard Informatics (2012).

Table 9.4.23.2-3 shows the estimated NPV of the transmission scheme and takes into account the cost of constructing the lines, the substations, and the projected revenue stream over the 10-year horizon. A positive NPV indicates that revenues more than offset investments. This calculation does not include the cost of producing electricity. The results of this analysis indicate that this transmission scheme is economically viable even at the base assumption of a 20% utilization factor.

Table 9.4.23.2-4 shows the effect of varying the value of the utilization factor on the NPV of the proposed transmission scheme. It also shows that as the utilization factor is increased, the economic viability of the lines increases. Utilization factors can be raised by allowing the new dedicated lines to market other power generation outputs in the region in addition to that of its associated SEZ.

The finding of the DLT analysis for the proposed Riverside East SEZ is as follows:

- Transmission scheme 1 represents a least-cost-investment scenario for the project and appears favorable in terms of NPV. It would result in new land disturbance of about 144,973 acres (587 km2). Other load area configurations are possible but would be less favorable than scheme 1 in terms of NPV and land use requirements.

9.4.23.3 Sensitivity to Solar-Eligible Load Assumption

This section briefly describes the results of a sensitivity analysis that was conducted in response to review comments and questions. The objective of this analysis was to examine the sensitivity of the results for Riverside East to the 20% solar-eligible load assumption (i.e., that loads eligible to be served by SEZs would be limited to 20% of the total load for each load area). This assumption was of particular interest for the Riverside East SEZ because the magnitude of solar capacity to be transmitted to various load areas is so large (23,666 MW) that the solution required connections with many load areas and transmission links covering long distances.

TABLE 9.4.23.2-1 Potential Transmission Scheme, Estimated Solar Markets, and Distances to Load Areas for the Proposed Riverside East SEZ

Transmission Scheme	City/Load Area Name	Estimated Peak Solar Market (MW)[i]	Total Solar Market (MW)	Sequential Distance (mi)[j]	Total Distance (mi)[c]	No. of Substations
1	Riverside County load, California[a]	90	24,547	84	4,264	31
	San Bernardino–Riverside County load I, California[b]	390		45		
	San Bernardino–Riverside County load II, California[c]	260		15		
	Los Angeles, California[d]	6,400		45		
	San Francisco Bay load II, California[e]	1,875		370		
	San Francisco Bay load I, California[f]	1,875		40		
	Sacramento, California[g]	1,075		121		
	Reno, Nevada[g]	213		104		
	Las Vegas, Nevada[g]	975		252		
	Salt Lake City, Utah[g]	562		307		
	San Diego, California[d]	650		129		
	San Diego County, California[h]	256		18		
	Yuma, Arizona[d]	46		121		
	Phoenix, Arizona[g]	2,100		55		
	Tucson, Arizona[g]	490		342		
	Farmington, New Mexico[d]	23		173		
	Albuquerque, New Mexico[g]	450		205		
	Denver, Colorado[g]	1,272		452		
	Dallas, Texas[g]	3,200		717		
	Austin, Texas[g]	850		193		
	San Antonio, Texas[g]	1,070		90		
	Las Cruces, New Mexico[d]	50		353		
	El Paso, Texas[g]	400		33		

[a] The Riverside County load area includes the communities of Indio, Cathedral City, and Palm Springs.

[b] The San Bernardino–Riverside County load I area includes the communities of Colton, Riverside, San Bernardino, Redlands, Highland, and Rialto.

[c] The San Bernardino–Riverside County load II area includes the communities of Fontana, Ontario, and Rancho Cucamonga.

[d] The load area represents the city named.

[e] The San Francisco Bay load II area is centered in San Jose and includes towns and cities within 3 mi to the north, 29 mi to the west, 33 mi to the northwest, 43 mi to the south, and 45 mi to the east.

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TABLE 9.4.23.2-1 (Cont.)

[f] The San Francisco Bay load I area is centered in Oakland and includes towns and cities within 50 mi to the east of Oakland, 14 mi to the west, 40 mi to the north, and 15 mi to the southeast.

[g] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[h] The San Diego County load area includes the cities of Imperial Beach, Spring Valley, National City, Chula Vista, La Mesa, and El Cajon.

[i] From Table 9.4.23.1-1.

[j] To convert mi to km, multiply by 1.6093.

TABLE 9.4.23.2-2 Land Use Requirements for the Proposed Riverside East SEZ

				Land Use (acres)[b]		
Transmission Scheme	City/Load Area Name	Total Distance (mi)[a]	No. of Substations	Transmission Line	Substation	Total
1	See Table 9.4.23.1-1	4,264	31	144,405	567.7	144,973

[a] To convert mi to km, multiply by 1.6093.

[b] To convert acres to km^2, multiply by 0.004047.

TABLE 9.4.23.2-3 NPV (Base Case) for the Proposed Riverside East SEZ

Transmission Scheme	City/Load Area Name	Present Value Transmission Line Cost ($ million)	Present Value Substation Cost ($ million)	Annual Sales Revenue ($ million)	Present Worth of Revenue Stream ($ million)	NPV ($ million)
1	See Table 9.4.23.1-1	98,128.8	1,562.0	4,146.3	32,016.5	1,325.7

TABLE 9.4.23.2-4 Effects of Varying the Utilization Factor on the NPV of the Transmission Scheme for the Proposed Riverside East SEZ

		NPV ($ million) at Different Utilization Factors					
Transmission Scheme	City/Load Area Name	20%	30%	40%	50%	60%	70%
1	See Table 9.4.23.1-1	1,326	17,334	33,342	49,350	65,359	81,367

The analysis consisted of increasing the solar-eligible load assumption from 20% to 30%. For example, Riverside County is estimated to have a total load of 450 MW, yielding 90 MW of solar-eligible load under the base case assumption of 20%. For the 30% sensitivity test, this load was increased to 135 MW. Load estimates for all other load areas were similarly increased for this analysis.

Results for the proposed Riverside East SEZ showed a high degree of sensitivity to the increase in the solar-eligible load assumption. In terms of load areas served, the 30% case was able to eliminate connections to major portions of the 20% case routings. With larger loads located closer to the SEZ, the 30% case eliminated links with Reno, Salt Lake City, Denver, Farmington, Albuquerque, Las Cruces, El Paso, Dallas, Austin, and San Antonio (see Figure 9.4.23.1-1 for relative locations of these load areas). Increased power deliveries to the remaining load areas allowed the full 23,666 MW to be accommodated in closer proximity to the SEZ.[3]

In terms of new transmission line distances, the 30% case yielded a total of 1,787 mi (2,876 km) for new lines, less than half of the 4,264 mi (6,862 km) needed in the 20% case. The number of substations was reduced from 31 in the 20% case to 19 in the 30% case. Land use showed similarly dramatic decreases, with the total disturbed land estimate dropping to 53,315 acres (216 km^2) in the 30% case (down from 144,973 acres [587 km^2] in the 20% case).

For cost comparisons, the shorter distances directly translated into substantial cost reductions. The 30% case yielded total transmission line and substation costs of $11.8 billion, compared with $30.7 billion for the 20% case. In addition, with lower costs for the 30% case, the NPV increased to $22.1 billion, compared with $4.1 billion for the 20% case.

9.4.24 Impacts of the Withdrawal

The BLM is proposing to withdraw the 159,457 acres (646 km^2) of public land comprising the proposed Riverside East SEZ from settlement, sale, location, or entry under the general land laws, including the mining laws, for a period of 20 years (see Section 2.2.2.2.4 of the Final Solar PEIS). The public lands would be withdrawn, subject to valid existing rights, from settlement, sale, location, or entry under the general land laws, including the mining laws. This means that the lands could not be appropriated, sold, or exchanged during the term of the withdrawal, and new mining claims could not be filed on the withdrawn lands. Mining claims filed prior to the segregation or withdrawal of the identified lands would take precedence over future solar energy development. The withdrawn lands would remain open to the mineral leasing, geothermal leasing, and mineral material laws, and the BLM could elect to lease the oil, gas, coal, or geothermal steam resources or to sell common-variety mineral materials such as sand and gravel, contained in the withdrawn lands. In addition, the BLM would retain the discretion to authorize linear and renewable energy ROWs on the withdrawn lands.

[3] Currently the achievability of 30% solar-eligible loads for the various load areas is unlikely. Advances in cost-effective energy storage capabilities over the 20-year study period may make solar-eligible loads of 30% or greater feasible.

The purpose of the proposed land withdrawal is to minimize the potential for conflicts between mineral development and solar energy development for the proposed 20-year withdrawal period. Under the land withdrawal, there would be no mining-related surface development, such as the establishment of open pit mining, construction of roads for hauling materials, extraction of ores from tunnels or adits, or construction of facilities to process the material mined, that could preclude use of the SEZ for solar energy development. For the Riverside East SEZ, impacts of the proposed withdrawal on mineral resources and related economic activity and employment are expected to be negligible to moderate, because the area contains known deposits of locatable minerals that were once mined along the northeastern boundary of the SEZ in the foothills of the Big Maria and Little Maria Mountains (currently, however, there is no mineral production within the SEZ) (BLM 2012c). The lands within the SEZ would remain open to mineral leasing, geothermal leasing, and mineral materials laws. Therefore, BLM could still elect to lease oil, gas, coal, or geothermal resources or to sell common-variety mineral materials, such as sand and gravel, at its discretion. The lands would also remain open to ROW authorizations.

For the Riverside East SEZ, the impacts of the proposed withdrawal on mineral resources and related economic activity and employment are expected to be negligible to moderate. Although the area contains known deposits of locatable minerals, currently there is no mineral production within the SEZ. The proposed withdrawal of lands within the SEZ would preclude many types of mining activity over a 20-year period, resulting in the avoidance of potential mining-related adverse impacts. Impacts commonly related to mining development include increased soil erosion and sedimentation, water use, generation of contaminated water in need of treatment, creation of lagoons and ponds (hazardous to wildlife), toxic runoff, air pollution, establishment of noxious weeds and invasive species, habitat destruction or fragmentation, disturbance of wildlife, blockage of migration corridors, increased visual contrast, noise, destruction of cultural artifacts and fossils and/or their context, disruption of landscapes and sacred places of interest to tribes, increased traffic and related emissions, and conflicts with other land uses (e.g., recreational).

9.4.25 References

Note to Reader: This list of references identifies Web pages and associated URLs where reference data were obtained for the analyses presented in this Final Solar EIS. It is likely that at the time of publication of this Final Solar PEIS, some of these Web pages may no longer be available or their URL addresses may have changed. The original information has been retained and is available through the Public Information Docket for this Final Solar PEIS.

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9.4.26 Errata for the Proposed Riverside East SEZ

This section presents corrections to material presented in the Draft Solar PEIS and the Supplement to the Draft Solar PEIS. The need for these corrections was identified in several ways: through comments received on the Draft Solar PEIS and the Supplement to the Draft (and verified by the authors), through new information obtained by the authors subsequent to publication of the Draft Solar PEIS and the Supplement to the Draft, or through additional review of the original material by the authors. Table 9.4.26-1 provides corrections to information presented in the Draft Solar PEIS and the Supplement to the Draft.

TABLE 9.4.26-1 Errata for the Proposed Riverside East SEZ (Section 9.4 of the Draft Solar PEIS and Section C.2.2 of the Supplement to the Draft Solar PEIS)

Section No.	Page No.	Line No.	Figure No.	Table No.	Correction
9.4.7.1	9.4-51	5-6			The figure number called out in this line should be Figure 9.4.7.1-3.
9.4.9.2.2,	9.4-75	12–13			"The highest groundwater extraction rate in the Chuckwalla Valley was reported to be 9,100 ac-ft/yr (11.2 million m3/yr) in 1966," should read, "A representative basin-scale groundwater withdrawal rate associated with steady groundwater surface elevations was reported to be 9,100 ac-ft/yr (11.2 million m^3/yr) in 1966."
9.4.11	9.4-95	34			Delete "as well as the CRA."
9.4.11	9.4-95	35-36			Change to "…in the center of the SEZ (Figure 9.4.12.1-1)." This involves deletion of "The CRA is located along the western border of the SEZ."
9.4.11.1.1	9.4-96	12-16			Delete the last two sentences of the paragraph starting with "Several other amphibian species…"
9.4.11.1.1	9.4-97				For the habitat description of Couch's spadefoot in Table 9.4.11.1-1, change "Requires pools or potholes with water that lasts longer than 10 to 12 days for breeding sites." To "Requires pools or potholes with10 to 12 days of consecutive days of ponding for breeding sites."
9.4.11.1.3	9.4-103	35-36			Change "…dry lake, wetlands, and the CRA)." To "…dry lake, and wetlands)."
9.4.11.1.3	9.4-103	42-44			Delete the design feature related to the Colorado River Aqueduct (CRA).
9.4.11.1.3	9.4-119	2			Delete ", but occur within the area of the CRA just northwest of the SEZ."
9.4.11.2					All uses of the term "neotropical migrants" in the text and tables of this section should be replaced with the term "passerines."
9.4.11.2.2	9.4-121	8			Change "reptile species" to "bird species."

TABLE 9.4.26-1 (Cont.)

Section No.	Page No.	Line No.	Figure No.	Table No.	Correction
9.4.11.2.3	9.4-121	18			Change "…Palen Lake, wetlands, and the CRA)." To "…Palen Lake, and wetlands)."
9.4.11.2.3	9.4-121	41			Change "…Palen Lake, wetlands, and the CRA." To "Palen Lake, and wetlands."
9.4.11.2.3	9.4-122	4-6			Delete the last sentence of the paragraph before the start of Section 9.4.11.3.
9.4.11.3.3	9.4-134	31			Change "…Lake, wetlands, and the CRA should be avoided." To "…Lake, and wetlands should be avoided."
C.2.2.3	C-59	NA	C.2.22		The legend to this figure gave the acreage of authorized solar projects within the SEZ as 27,542 acres. The acreage should have been given as approximately 9,000 acres.