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)

13 UPDATE TO AFFECTED ENVIRONMENT AND IMPACT ASSESSMENT FOR PROPOSED SOLAR ENERGY ZONES IN UTAH

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 Utah. 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 under way 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 on 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 (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 affected 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 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 Utah SEZs presented in the Draft Solar PEIS. The information presented supplements and updates, but does not replace, the information provided in the corresponding Chapter 13 on proposed SEZs in Utah in the Draft Solar PEIS. Corrections to incorrect information in Sections 13.1, 13.2, and 13.3 of the Draft Solar PEIS and in Sections C.6.1, C.6.2, and C.6.3 of the Supplement to the Draft are provided in Sections 13.1.26, 13.2.26, and 13.3.26 of this Final Solar PEIS.

13.3 WAH WAH VALLEY

13.3.1 Background and Summary of Impacts

13.3.1.1 General Information

The proposed Wah Wah Valley SEZ is located in Beaver County in southwestern Utah about 21 mi (34 km) northwest of the proposed Milford Flats South SEZ. In 2008, the county population was 7,265, while adjacent Iron County to the south had a population of 45,833. The largest nearby town is Cedar City, Utah, about 50 mi (80 km) southeast in Iron County. The town of Milford is located about 23 mi (37 km) east.

The SEZ can be accessed from State Route 21, which runs from west to east through the northern half of the SEZ. Access to the interior of the SEZ is by dirt roads. The nearest UP Railroad stop is 23 mi (37 km) away in Milford. As of October 28, 2011, there were no pending ROW applications for solar projects within the SEZ.

As published in the Draft Solar PEIS (BLM and DOE 2010), the proposed Wah Wah Valley SEZ had a total area of 6,097 acres (25 km^2) (see Figure 13.3.1.1-1). In the Supplement to the Draft Solar PEIS (BLM and DOE 2011), no boundary revisions were identified for the proposed SEZ. However, areas specified for non-development were mapped, where data were available. For the proposed Wah Wah Valley SEZ, 224 acres (0.91 km^2) of the Wah Wah Wash was identified as a non-development area (see Figure 13.3.1.1-2). The remaining developable area within the SEZ is 5,873 acres (23.8 km^2).

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 Wah Wah Valley SEZ as described in the Draft Solar PEIS.

13.3.1.2 Development Assumptions for the Impact Analysis

Maximum solar development of the Wah Wah Valley SEZ was assumed to be 80% of the developable SEZ area over a period of 20 years, a maximum of 4,698 acres (19 km^2). Full development of the Wah Wah Valley SEZ would allow development of facilities with an estimated total of between 522 MW (power tower, dish engine, or PV technologies, 9 acres/MW [0.04 km^2/MW]) and 940 MW (solar trough technologies, 5 acres/MW [0.02 km^2/MW]) of electrical power capacity (Table 13.3.1.2-1).

Availability of transmission from SEZs to load centers will be an important consideration for future development in SEZs. For the proposed Wah Wah Valley SEZ, the nearest existing transmission line as identified in the Draft Solar PEIS is a 138-kV line 42 mi (68 km) east of the SEZ. It is possible that a new transmission line could be constructed from the SEZ to this existing line, but the capacity of the line would be inadequate for the possible 522 to 940 MW

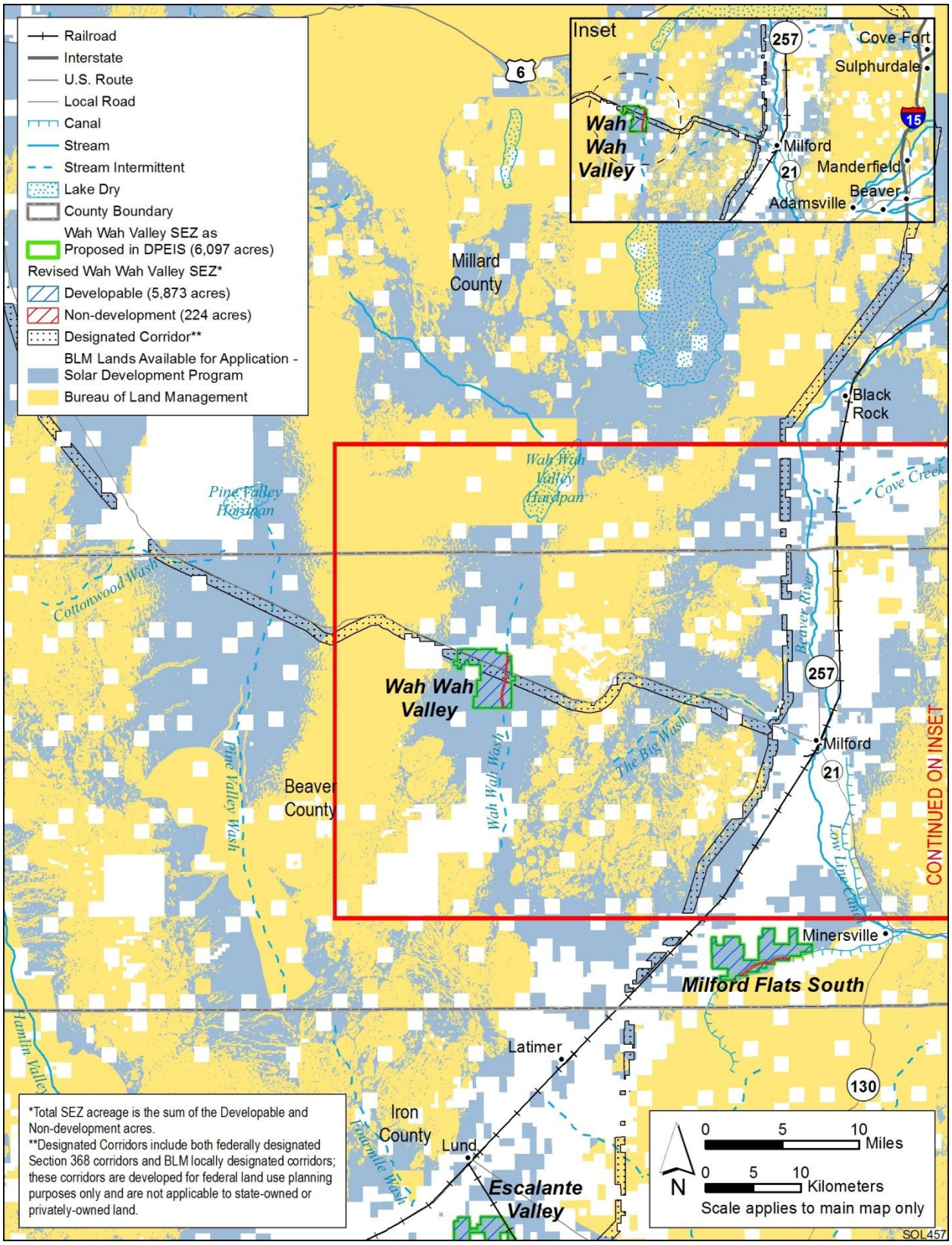

FIGURE 13.3.1.1-1 Proposed Wah Wah Valley SEZ as Revised

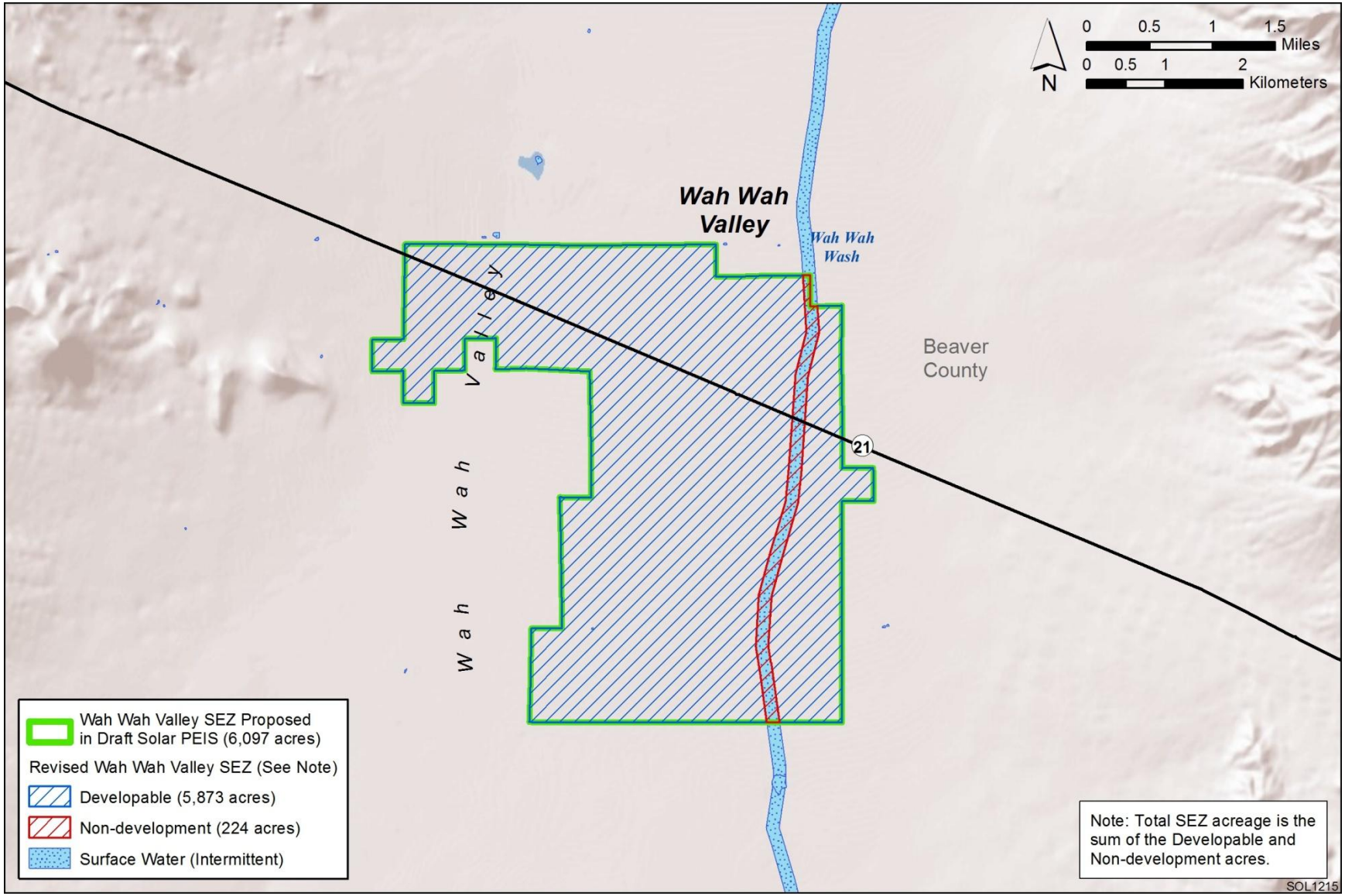

FIGURE 13.3.1.1-2 Developable and Non-development Areas for the Proposed Wah Wah Valley SEZ as Revised

TABLE 13.3.1.2-1 Assumed Development Acreages, Solar MW Output, and Nearest Major Access Road and Transmission Line for the Proposed Wah Wah Valley 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 Corridor[f]
5,873 acres[a] and 4,698 acres	522 MW[b] 940 MW[c]	State Route 21: adjacent	42 mi[d] and 130 kV	NA[e]	Adjacent

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

[e] NA = no access road construction is assumed necessary for Wah Wah Valley.

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

of new capacity. Therefore, at full build-out capacity, new transmission and possibly also upgrades of existing transmission lines would be required to bring electricity from the proposed Wah Wah Valley SEZ to load centers. An assessment of the most likely load center destinations for power generated at the Wah Wah Valley SEZ and a general assessment of the impacts of constructing and operating new transmission facilities to those load centers are provided in Section 13.3.23. In addition, the generic impacts of transmission 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 new transmission construction and line upgrades for any projects proposed within the SEZ.

The transmission assessment for the Wah Wah Valley SEZ has been updated, and the hypothetical transmission corridor assessed in the Draft Solar PEIS is no longer applicable. For this Final Solar PEIS, the 1,273 acres (5.2 km^2) of land disturbance for a hypothetical transmission corridor to the existing transmission line is no longer assumed (although the impacts of required new transmission overall are addressed in Section 13.3.23).

The Wah Wah Valley SEZ partially overlaps a Section 368 federally designated energy corridor that runs east–west through the SEZ along State Route 21.[1] 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 the corridor. The development of solar facilities and the existing corridor will be dealt with by the BLM on a case-by-case basis; see Section 13.3.2.2 on impacts on lands and realty for further discussion.

For the proposed Wah Wah Valley SEZ, existing road access should be adequate to support construction and operation of solar facilities, because State Route 21 runs from west to east through the northern portion of the SEZ. Thus, no additional road construction outside of the SEZ is assumed to be required to support solar development, as summarized in Table 13.3.1.2-1.

13.3.1.3 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, reduce, and/or mitigate adverse impacts of 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 13.3.2 through 13.3.22) 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 Wah Wah Valley SEZ may be required in addition to the programmatic design features. The proposed SEZ-specific design features for the Wah Wah Valley 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 and Supplement to the Draft Solar PEIS. All applicable SEZ-specific design features identified to date (including those from the Draft Solar PEIS that are still applicable) are presented in Sections 13.3.2 through 13.3.22.

[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.

13.3.2 Lands and Realty

13.3.2.1 Affected Environment

The boundaries of the Wah Wah Valley SEZ as proposed in the Draft Solar PEIS have not changed. A total of 224 acres (0.91 km^2) of Wah Wah Wash have been identified as non-development areas. The northern boundary of the SEZ is immediately adjacent to a ranch homeplace, ranch buildings, and a feedlot and the access road to the ranch is within the SEZ. The remaining description of the area in the Draft Solar PEIS is still valid.

13.3.2.2 Impacts

Full development of the SEZ would disturb up to 5,873 acres (23.8 km^2) and would exclude many existing and potential uses of the public land. Because the area is rural and undeveloped, utility-scale solar energy development would introduce a new and discordant land use into the area. Solar development along the northern boundary of the SEZ would dramatically conflict with development on the adjacent private land.

The proposed Wah Wah Valley SEZ partially overlaps a Section 368 federally designated energy corridor. This existing corridor will be used primarily for the siting of transmission lines and other infrastructure such as pipelines. The existing corridor will be the preferred location for any transmission development that is required to support solar development and future transmission grid improvements related to the build-out of the Wah Wah Valley SEZ. Any use of the corridor lands within the Wah Wah Valley SEZ for solar energy facilities, such as solar panels or heliostats, must be compatible with the future use of the existing corridor. The BLM will assess solar projects in the vicinity of existing corridor on a case-by-case basis. The BLM will review and approve individual project plans of development to ensure compatible development that maintains the use of the corridor.

13.3.2.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on lands and realty activities 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 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 may not be fully mitigated.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, the following SEZ-specific design feature for lands and realty has been identified:

- Development may need to be restricted in the northern portion of the SEZ near the ranch development on private land to provide a buffer between private land developments and solar energy facility development.

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.

13.3.3 Specially Designated Areas and Lands with Wilderness Characteristics

13.3.3.1 Affected Environment

Two WSAs and two wilderness inventory units are within 25 mi (40 km) of the proposed Wah Wah Valley SEZ. The description of the area in the Draft Solar PEIS remains valid.

13.3.3.2 Impacts

Solar energy development within the proposed SEZ is anticipated to have adverse impacts on wilderness characteristics of the Wah Wah Mountains WSA and on the Central and Northern Wah Wah Mountains wilderness inventory units. The analysis in the Draft Solar PEIS remains valid.

13.3.3.3 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 may provide some mitigation for the identified impacts, but the adverse impacts on wilderness characteristics in the WSAs and the two wilderness inventory units would not be fully mitigated.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features for specially designated areas and lands with wilderness characteristics 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.

13.3.4 Rangeland Resources

13.3.4.1 Livestock Grazing

13.3.4.1.1 Affected Environment

One perennial grazing allotment overlies the proposed Wah Wah Valley SEZ. The description of the area in the Draft Solar PEIS remains valid.

13.3.4.1.2 Impacts

Less than 3% of the Wah Wah Lawson allotment would be directly affected by full development of the SEZ, but the permittee has indicated that because of the location of the SEZ, he will encounter difficulties with watering his livestock. Because of the size of the allotment, it is possible that the potential loss of 221 AUMs within the SEZ could be replaced elsewhere in the allotment, but it is not clear at the current level of analysis how issues associated with livestock watering can be effectively addressed. Should the 221 AUMs be lost, there would be an economic loss to the ranch operation. Should the livestock-watering issue not be solvable, an additional loss of AUMs would likely occur. This will have to be addressed at the site-specific level when a proposal for solar energy development is being considered.

Economic impacts of the loss of grazing capacity must be determined at the allotment-specific level. For most public land grazing operations, any loss of grazing capacity is an economic concern, but it is not possible to assess the extent of that specific impact at this programmatic level. For that reason, only a general assessment is made based on the projected loss of livestock AUMs; this assessment does not consider potential impacts on management costs, on reducing the scale of an operation, or on the value of the ranch, including private land values and other grazing associated assets.

The remaining discussion of impacts in the Draft Solar PEIS is still applicable.

13.3.4.1.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on livestock grazing are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features could provide adequate mitigation for identified impacts associated with the livestock watering issues but will not mitigate for any loss of livestock AUMs, or the loss of value in ranching operations including private land values.

No SEZ-specific design features to protect livestock grazing 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.

13.3.4.2 Wild Horses and Burros

13.3.4.2.1 Affected Environment

As presented in the Draft Solar PEIS, no wild horse or burro HMAs occur within the proposed Wah Wah Valley SEZ or in close proximity to it.

13.3.4.2.2 Impacts

As presented in the Draft Solar PEIS, solar energy development within the proposed Wah Wah Valley SEZ would not affect wild horses and burros.

13.3.4.2.3 SEZ-Specific Design Features and Design Feature Effectiveness

Because solar energy development within the proposed Wah Wah Valley 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.

13.3.5 Recreation

13.3.5.1 Affected Environment

The proposed Wah Wah Valley SEZ offers little potential for extensive significant recreational use, although it is likely that local residents use it for general recreational purposes. The description in the Draft Solar PEIS remains valid.

13.3.5.2 Impacts

Recreational users would be excluded from any portions of the SEZ developed for solar energy production, but recreational impacts are anticipated to be low.

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.

The remaining discussion of impacts on recreation in the Draft Solar PEIS remains valid.

13.3.5.3 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 some mitigation for identified impacts with the exception of the exclusion of recreational users from developed portions of the SEZ.

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

13.3.6 Military and Civilian Aviation

13.3.6.1 Affected Environment

There are no identified military or civilian aviation uses in near proximity to the proposed Wah Wah Valley SEZ.

13.3.6.2 Impacts

The southeastern boundary of the Utah Test and Training Range is about 5 mi (8 km) northwest of the SEZ. There are no identified impacts on military or civilian aviation facilities associated with the proposed Wah Wah Valley SEZ.

13.3.6.3 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, any potential impacts on the use of military airspace. Implementing programmatic design features will reduce the potential for impacts on military and civilian aviation.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features for military or 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.

13.3.7 Geologic Setting and Soil Resources

13.3.7.1 Affected Environment

13.3.7.1.1 Geologic Setting

Data provided in the Draft Solar PEIS remain valid. The boundaries of the proposed Wah Wah Valley SEZ remain the same, but 224 acres (0.91 km^2) of the Wah Wah Wash have been identified as non-development areas.

13.3.7.1.2 Soil Resources

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

- Table 13.3.7.1-1 provides revised areas for soil map units taking into account the non-development area within the Wah Wah Valley SEZ as revised.

13.3.7.2 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 the developable area of the SEZ has changed by less than 4%, the assessment of impacts provided in the Draft Solar PEIS remains valid, with the following updates:

- Impacts related to wind erodibility are somewhat reduced, because the identification of non-development areas eliminates 205 acres (0.82 km^2) of moderately erodible soils from development (riverwash soils are not rated for wind erodibility).

- Impacts related to water erodibility are somewhat reduced, because the identification of non-development areas eliminates 61 acres (0.25 km^2) of moderately erodible soils from development (riverwash soils are not rated for water erosion potential).

13.3.7.3 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.

TABLE 13.3.7.1-1 Summary of Soil Map Units within the Proposed Wah Wah Valley SEZ as Revised

Map Unit Symbol[a]	Map Unit Name	Erosion Potential		Description	Area in Acres[d] (Percentage of SEZ)
		Water[b]	Wind[c]		
182	Siltcliffe silty clay loam (0 to 3% slopes)	Moderate	Moderate (WEG 6)[e]	Nearly level soils on alluvial flats. Parent material consists of alluvium from igneous and sedimentary rocks. Soils are very deep and well drained, with moderate surface-runoff potential and high permeability. Available water capacity is moderate. Partially hydric. Severe rutting hazard. Used for livestock grazing and wildlife habitat.	3,363 (55.2)[f]
183	Siltcliffe–Hiko Springs–Dera complex (0 to 3% slopes)	Slight	Moderate (WEG 3)	Nearly level soils (very fine sandy loams) on alluvial flats. Parent material consists of alluvium from igneous and sedimentary rocks. Soils are very deep and well drained, with moderate surface-runoff potential and high permeability. Available water capacity is moderate. Moderate rutting hazard. Used for rangeland and wildlife habitat.	1,386 (22.7)[g]
180	Siltcliffe–Thermosprings complex (0 to 2% slopes)	Slight	Moderate (WEG 3)	Nearly level soils (sandy loams) on alluvial flats. Parent material consists of alluvium from igneous and sedimentary rocks. Soils are very deep and well drained, with moderate surface-runoff potential and high permeability. Available water capacity is moderate. Partially hydric. Moderate rutting hazard. Used for rangeland and wildlife habitat.	442 (7.3)[h]
176	Dera–Lynndyl complex (0 to 3% slopes)	Slight	Moderate (WEG 4)	Nearly level soils (sandy clay loams) on alluvial fan skirts. Parent material consists of eolian material, alluvium, and colluvium from igneous and sedimentary rocks and lacustrine deposits. Soils are very deep and well drained, with moderate surface-runoff potential and high permeability. Available water capacity is low. Moderate rutting hazard. Used for rangeland and wildlife habitat.	363 (6.0)
177	Dera sandy clay loam (0 to 5% slopes)	Slight	Moderate (WEG 4)	Nearly level soils on alluvial fan skirts and relict longshore bars. Parent material consists of alluvium from igneous and sedimentary rocks. Soils are very deep and well drained, with moderate surface-runoff potential and high permeability. Available water capacity is low. Moderate rutting hazard. Used for rangeland and wildlife habitat.	260 (4.3)

TABLE 13.3.7.1-1 (Cont.)

Map Unit Symbol[a]	Map Unit Name	Erosion Potential		Description	Area in Acres[d] (Percentage of SEZ)
		Water[b]	Wind[c]		
181	Siltcliffe sandy clay loam (0 to 2% slopes)	Slight	Moderate (WEG 4)	Nearly level soils on alluvial flats. Parent material consists of alluvium from igneous and sedimentary rocks and lacustrine deposits. Soils are very deep and well drained, with moderate surface-runoff potential and high permeability. Available water capacity is high. Severe rutting hazard. Used for rangeland and wildlife habitat.	143 (2.3)
175	Hiko Peak, dry-Lynndyl association	Slight	Moderate (WEG 5)	Nearly level soils (cobbly sandy loams) on alluvial fan skirts and relict longshore bars. Parent material consists of alluvium from igneous and sedimentary rocks. Soils are very deep and well drained, with low surface-runoff potential (high infiltration rate) and high permeability. Available water capacity is low. Moderate rutting potential. Used for rangeland and wildlife habitat.	111 (1.8)
135	Riverwash (4 to 15% slopes)	Not rated	Not rated	Riverwash soils within streams and channels; occasional flooding. All hydric. Rutting hazard not rated.	29 (<1.0)[i]

[a] Map unit symbols are shown in Figure 13.3.7.1-5 of the Draft Solar PEIS.

[b] Water erosion potential rates the hazard of soil loss from off-road and off-trail areas after disturbance activities that expose the soil surface. The ratings are based on slope and soil erosion factor K (whole soil; does not account for the presence of rock fragments) and represent soil loss caused by sheet or rill erosion where 50 to 75% of the surface has been exposed by ground disturbance. A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions. A rating of "severe" indicates that erosion is expected; loss of soil productivity and damage are likely and erosion control measures may be costly or impractical. A rating of "moderate" indicates that erosion could be expected under ordinary climatic conditions.

[c] Wind erosion potential here is based on the wind erodibility group (WEG) designation: groups 1 and 2, high; groups 3 through 6, moderate; and groups 7 and 8 low (see footnote d for further explanation).

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

Footnotes continued on next page.

TABLE 13.3.7.1-1 (Cont.)

[e] WEGs are based on soil texture, content of organic matter, effervescence of carbonates, content of rock fragments, and mineralogy, and also take into account soil moisture, surface cover, soil surface roughness, wind velocity and direction, and the length of unsheltered distance (USDA 2004). Groups range in value from 1 (most susceptible to wind erosion) to 8 (least susceptible to wind erosion). The NRCS provides a wind erodibility index, expressed as an erosion rate in tons per acre per year, for each of the wind erodibility groups: WEG 1, 220 tons (200 metric tons) per acre (4,000 m^2) per year (average); WEG 2, 134 tons (122 metric tons) per acre (4,000 m^2) per year; WEGs 3 and 4 (and 4L), 86 tons (78 metric tons) per acre (4,000 m^2) per year; WEG 5, 56 tons (51 metric tons) per acre (4,000 m^2) per year; WEG 6, 48 tons (44 metric tons) per acre (4,000 m^2) per year; WEG 7, 38 tons (34 metric tons) per acre (4,000 m^2) per year; and WEG 8, 0 tons (0 metric tons) per acre (4,000 m^2) per year.

[f] A total of 61 acres (0.25 km^2) within the Siltcliffe silty clay loam in the northern portion of the SEZ is currently categorized as a non-development area.

[g] A total of 123 acres (0.50 km^2) within Siltcliffe–Hiko Springs–Dera complex is currently categorized as a non-development area.

[h] A total of 21 acres (0.085 km^2) within the Siltcliffe–Thermosprings complex is currently categorized as a non-development area.

[i] A total of 19 acres (0.077 km^2) of riverwash in the southern portion of the SEZ is currently categorized as a non-development area.

Source: NRCS (2010).

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

13.3.8 Minerals (Fluids, Solids, and Geothermal Resources)

A mineral potential assessment for the proposed Wah Wah Valley SEZ has been prepared and reviewed by BLM mineral specialists knowledgeable about the region where the SEZ is located (BLM 2012a). 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 13.3.24.

13.3.8.1 Affected Environment

No known locatable minerals are present within the proposed Wah Wah Valley SEZ, and there are no oil and gas leases in the SEZ. There were geothermal leases located southeast of the SEZ, but those are now closed. No geothermal development has occurred within or near the SEZ. The description in the Draft Solar PEIS remains valid.

13.3.8.2 Impacts

No impacts on mineral resources were identified in the Draft Solar PEIS. The analysis in the Draft Solar PEIS remains valid.

13.3.8.3 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 and consideration of comments received as applicable, no SEZ-specific design features for minerals 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.

13.3.9 Water Resources

13.3.9.1 Affected Environment

The description of the affected environment given in the Draft Solar PEIS relevant to water resources at the proposed Wah Wah Valley SEZ remains valid and is summarized in the following paragraphs.

The Wah Wah Valley SEZ is located within the Escalante Desert–Sevier Lake subregion of the Great Basin hydrologic region. The SEZ is located in the Wah Wah Valley, which is a closed basin, with the Wah Wah Mountains to the west, San Francisco Mountain to the east, low-lying hills to the south, and a drainage divide to the north. Average precipitation is estimated to be 7 in./yr (18 cm/yr), with snowfalls of 5 in./yr (13 cm/yr), and the average pan evaporation rate is estimated to be 71 in./yr (180 cm/yr). There are no perennial surface water features within the Wah Wah Valley, but the Wah Wah Wash runs northward through the SEZ. The area around the Wah Wah Wash has been identified as non-development lands totaling 224 acres (0.91 km^2). The area has not been examined for flood risk, but any flooding would be limited to local ponding and erosion. No wetlands have been identified in or around the SEZ.

Groundwater in the Wah Wah Valley is found in basin-fill deposits and in underlying regional carbonate-rock aquifers. The basin-fill aquifer is on the order of 1,000 to 4,000 ft (305 to 1,219 m) in thickness and is composed of intermixed particles ranging from clays to boulders. The carbonate-rock aquifer under the Wah Wah Valley is highly fractured and connected to the Fish Springs Flow System, which includes Pine Valley, Snake Valley, Tule Valley, and Fish Springs Flat, all located to the north and west of Wah Wah Valley in Nevada. Wah Wah Spring is a series of springs located 2 mi (3.2 km) west of the SEZ and is a local discharge point of the carbonate rock aquifer. Recent studies estimate the discharge of Wah Wah Spring to be 1,530 ac-ft/yr (1.9 million m^3/yr). Groundwater recharge is estimated to be 10,000 ac-ft/yr (12.3 million m^3/yr) and is primarily supplied by groundwater discharge from adjacent basins and mountain front recharge in the Wah Wah Valley. Groundwater typically flows northward along the axis of the valley in the basin-fill aquifer, while groundwater flows toward Fish Springs Flat in the regional carbonate-rock aquifer. A monitoring well around the SEZ indicates a depth to groundwater of 660 ft (201 m). The water quality of the groundwater is considered hard, with a majority of water samples having total dissolved solids (TDS) concentrations above the secondary MCL; a small number of samples had sulfate concentrations greater than the secondary MCL.

In Utah, water resources are considered public, and water rights are allocated by the UDWR. The Wah Wah Valley is under the jurisdiction of the southwestern region office of the UDWR and is located in Policy Area 69 (Wah Wah Valley and Sevier Lake). Two pending groundwater applications have the potential to withdraw substantial groundwater quantities. The limited information on groundwater resources in Wah Wah Valley, in addition to information regarding the connectivity of the basin-fill aquifer to the regional carbonate aquifer, has prompted the U.S. Department of the Interior to initiate a groundwater investigation to assess potential impacts on groundwater resources in this region. Preliminary groundwater modeling

results consider five projected groundwater pumping scenarios, all of which include the proposed applications in the Wah Wah Valley, and suggest that several hundred feet of drawdown could occur in the vicinity of the Wah Wah Valley (Durbin and Loy 2010).

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 Wah Wah Valley SEZ and the surrounding basin. Additional data regarding climate, surface water, and groundwater conditions are presented in Tables 13.3.9.1-1 through 13.3.9.1-7 and in Figures 13.3.9.1-1 and 13.3.9.1-2. Fieldwork and hydrologic analyses needed to determine 100-year floodplains and jurisdictional water bodies would need to be coordinated with appropriate federal, state, and local agencies. Areas within the Wah Wah Valley SEZ that are found to be within a 100-year floodplain will be identified as non-development areas. Any water features within the Wah Wah Valley SEZ determined to be jurisdictional will be subject to the permitting process described in the CWA.

13.3.9.2 Impacts

13.3.9.2.1 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. In particular, land disturbance impacts in the vicinity of the Wah Wah Valley SEZ could result in increased erosion and sedimentation along the Wah Wah Wash. The identification of Wah Wah Wash and portions of its riparian regions as non-development areas reduces the potential for adverse impacts associated with land disturbance activities.

TABLE 13.3.9.1-1 Watershed and Water Management Basin Information Relevant to the Proposed Wah Wah Valley SEZ as Revised

Basin	Name	Area (acres)[b]
Subregion (HUC4)[a]	Escalante Desert–Sevier Lake (1603)	10,544,005
Cataloging unit (HUC8)	Sevier Lake (16030009)	854,940
Groundwater basin	Wah Wah Valley	384,000
SEZ	Wah Wah Valley	6,097

[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 km2, multiply by 0.004047.

TABLE 13.3.9.1-2 Climate Station Information Relevant to the Proposed Wah Wah Valley 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.)
Milford, Utah (425654)	5,010	21	1906–2011	9.10	34.10
Minersville, Utah (425723)	5,280	31	1897–2011	11.18	22.30
Sevier Dry Lake, Utah (427747)	4,525	22	1987–1993	6.96	20.80
Wah Wah Ranch, Utah (429152)	4,880	2	1955–2008	6.77	5.20

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

[b] Surface elevations for the proposed Wah Wah Valley SEZ range from 4,880 to 5,125 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 13.3.9.1-3 Total Lengths of Selected Streams at the Subregion, Cataloging Unit, and SEZ Scale Relevant to the Proposed Wah Wah Valley SEZ as Revised

Water Feature	Subregion, HUC4 (ft)[a]	Cataloging Unit, HUC8 (ft)	SEZ (ft)
Unclassified streams	0	0	0
Perennial streams	14,121,714	32,963	0
Intermittent/ephemeral streams	160,714,376	11,846,101	94,170
Canals	10,978,835	126,155	5,389

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

Source: USGS (2012a).

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 PEIS would avoid, minimize, and/or mitigate programmatic 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.

TABLE 13.3.9.1-4 Stream Discharge Information Relevant to the Proposed Wah Wah Valley SEZ as Revised

Parameter	Station (USGS ID) Wah Wah Valley Tributary near Milford, Utah (10231700)
Period of record	1961–1968
No. of records	7
Discharge, range (ft^3/s)[a]	0–1,270
Discharge, most recent observation (ft^3/s)	1,270
Distance to SEZ (mi)[b]	7

[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).

The study region considered for the intermittent/ephemeral stream evaluation relevant to the Wah Wah Valley SEZ is a subset of the Sevier Lake watershed (HUC8), for which information regarding stream channels is presented in Tables 13.3.9.1-3 and 13.3.9.1-4 in this Final Solar PEIS. The evaluation categorized flow lines from the National Hydrography Dataset (USGS 2012a) as having low, moderate, and high sensitivity to land disturbance. Within the study area, 30% of the intermittent/ephemeral stream channels had low sensitivity, 55% had moderate sensitivity, and 15% had high sensitivity to land disturbance (Figure 13.3.9.2-1). Within the Wah Wah Valley SEZ, the majority of intermittent/ephemeral stream channels were low sensitivity reaches, one channel in the western portion of the SEZ had moderate sensitivity, and the majority of the high sensitivity reaches were just to the west of the SEZ found in channels draining the Wah Wah Mountains (Figure 13.3.9.2-1). Any alterations to intermittent/ephemeral stream channels in the SEZ would be subject to review by the Utah DWR's Stream Alteration Program, which considers natural streams features that receive enough water for sustaining ecosystems that can be observed primarily by vegetation patterns (Utah DWR 2004).

13.3.9.2.2 Water Use Requirements for Solar Energy Technologies

The water use requirements for full build-out scenarios of the Wah Wah Valley SEZ have not changed from the values presented in the Draft Solar PEIS (see Tables 13.3.9.2-1 and 13.3.9.2-2 in the Draft Solar PEIS). This section presents additional analyses of groundwater, which includes a basin-scale water budget and a simplified, one-dimensional groundwater model to assess groundwater drawdown for various development scenarios. 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 13.3.9.1-5 Surface Water Quality Data Relevant to the Proposed Wah Wah Valley SEZ as Revised

Parameter	Station (USGS ID)[a]			
	381835113361701	382340113302401	382843113291401	383617113140201
Period of record	1972	1972	1972	1987
No. of records	1	1	1	1
Temperature (°C)[b]	11	14	16	13
Total dissolved solids (mg/L)	322	586	348	422
Dissolved oxygen (mg/L)	NA[c]	NA	NA	NA
pH	8.1	7.5	8.1	7.6
Nitrate + nitrite (mg/L as N)	0.74	2.8	1.4	1.4
Phosphate (mg/L)	0.06	0.18	0.03	NA
Organic carbon (mg/L)	NA	NA	NA	NA
Calcium (mg/L)	100	120	64	64
Magnesium (mg/L)	10	39	31	17
Sodium (mg/L)	6.3	33	21	64
Chloride (mg/L)	10	110	38	86
Sulfate (mg/L)	14	39	15	39
Arsenic (µg/L)	NA	NA	NA	NA

[a] Median values are listed.

[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 13.3.9.1-6 Water Quality Data from Groundwater Samples Relevant to the Proposed Wah Wah Valley SEZ as Revised

	Station (USGS ID)[a]		
Parameter	382350113231901	384351113150501	390623113084101
Period of record	1974	1987	1981
No. of records	1	1	1
Temperature (°C)[b]	24.5	16	15
Total dissolved solids (mg/L)	344	23,900	49,300
Dissolved oxygen (mg/L)	NA[c]	NA	NA
pH	7.8	7.7	7.5
Nitrate + nitrite (mg/L as N)	1.2	<0.100	1.5
Phosphate (mg/L)	0.15	NA	NA
Organic carbon (mg/L)	NA	NA	NA
Calcium (mg/L)	23	350	1,600
Magnesium (mg/L)	7.3	390	1,700
Sodium (mg/L)	67	6,700	13,000
Chloride (mg/L)	28	10,000	28,000
Sulfate (mg/L)	66	6,300	4,600
Arsenic (µg/L)	NA	NA	84

[a] Median values are listed.

[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 13.3.9.1-7 Groundwater Surface Elevations Relevant to the Proposed Wah Wah Valley SEZ as Revised

	Station (USGS ID)		
Parameter	382350113231901	390623113084101	384351113150501
Period of record	1974–2011	1980–2011	1981–2011
No. of observations	46	102	45
Surface elevation (ft)[a]	5,195	4,544	4,555
Well depth (ft)	1,475	150	145
Depth to water, median (ft)	663.39	55.19	96.52
Depth to water, range (ft)	662.65–670	54.42–57.57	94.53–107.27
Depth to water, most recent observation (ft)	663.3	57.57	96.17
Distance to SEZ (mi)[b]	4	47	21

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

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

Source: USGS (2012b).

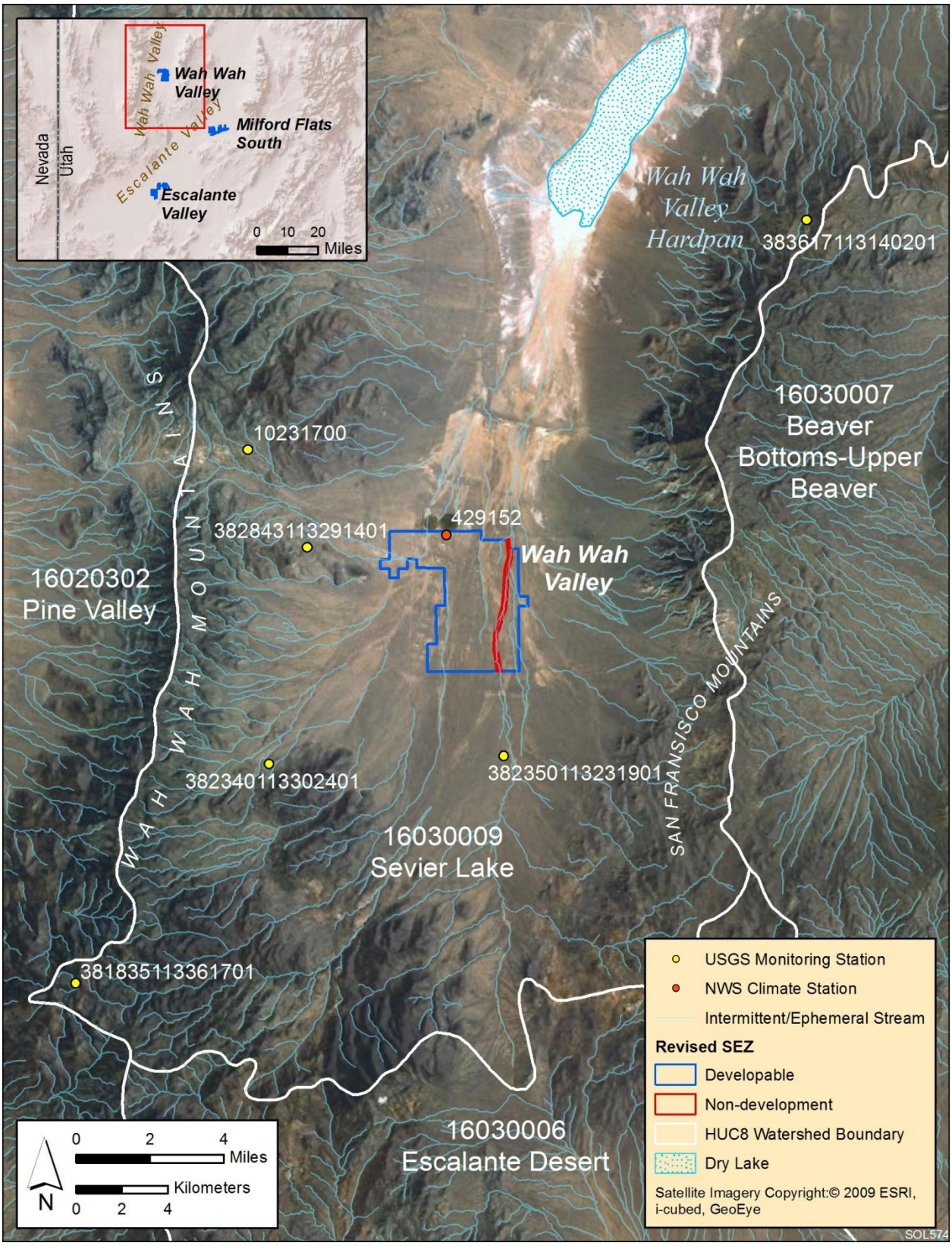

FIGURE 13.3.9.1-1 Water Features near the Proposed Wah Wah Valley SEZ as Revised

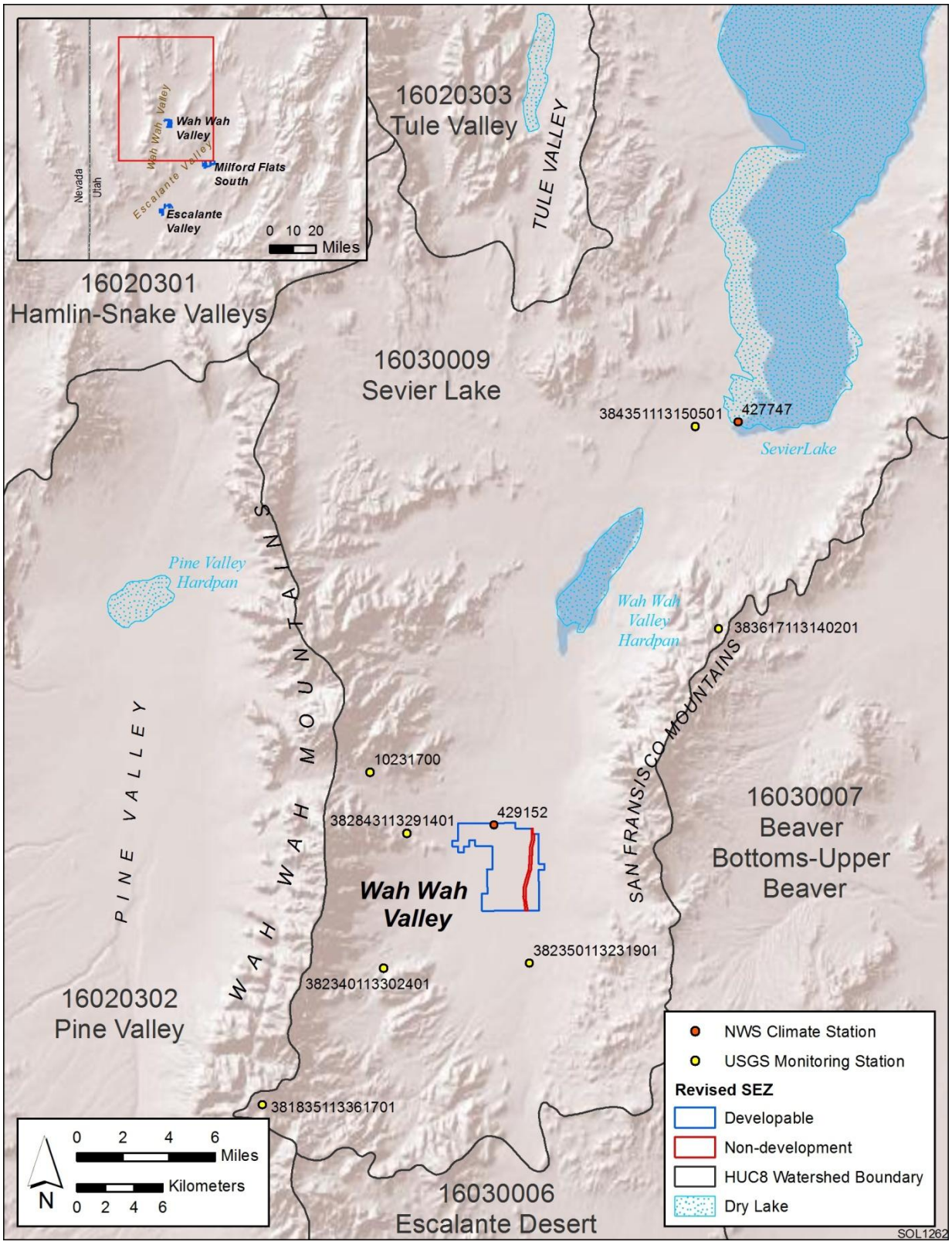

FIGURE 13.3.9.1-2 Water Features within the Sevier Lake Watershed, Which Includes the Proposed Wah Wah Valley SEZ as Revised

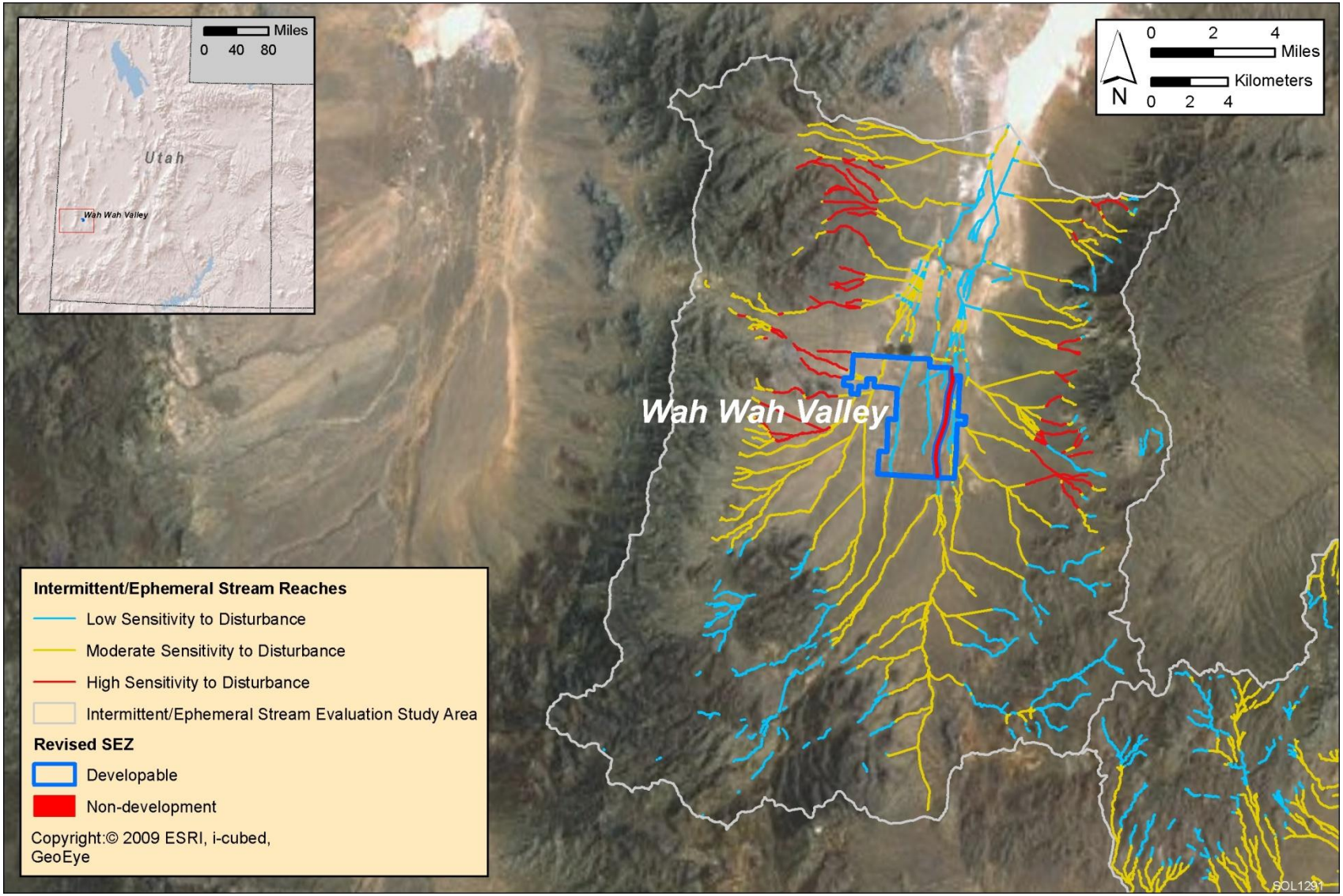

FIGURE 13.3.9.2-1 Intermittent/Ephemeral Stream Channel Sensitivity to Surface Disturbances in the Vicinity of the Proposed Wah Wah Valley SEZ as Revised

A basin-scale groundwater budget was assembled using available data on groundwater inputs, outputs, and storage (Table 13.3.9.2-1) in order to compare with water use estimates related to solar energy development. The estimated total water use requirements during the peak construction year are as high as 1,261 ac-ft/yr (1.6 million m^3/yr), which represents 23% of the annual recharge from precipitation for the basin. Given the short duration of construction activities, the water use estimate for construction is not a primary concern to water resources in the basin. The long duration of groundwater pumping during operations (20 years) poses a greater threat to groundwater resources. This analysis considered low, medium, and high groundwater pumping scenarios that represent full build-out of the SEZ assuming PV, dry-cooled parabolic trough, and wet-cooled parabolic trough, respectively (a 30% operational time was considered for all the solar facility types on the basis of operations estimates for proposed utility-scale solar energy facilities). The low, medium, and high pumping scenarios result in groundwater withdrawals that range from 28 to 4,892 ac-ft/yr (34,500 to 6 million m^3/yr), or a total of 560 to 97,840 ac-ft (690,700 to 121 million m^3) over the 20-year analysis period. From a groundwater budgeting perspective, the high pumping scenario would represent 90% of the recharge by precipitation and 22% of the total groundwater inputs to the basin. The groundwater withdrawals associated with the low and medium pumping scenarios represent 1% and 13%, respectively, of the amount of recharge by precipitation to the basin. The low and medium pumping scenario groundwater withdrawal rates are more in the realm of suitable recharge-based sustainable yield estimates, although sustainable yield estimates based solely on recharge are typically not recommended (Zhou 2009).

Groundwater budgeting allows 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; however, the aquifer parameters used for the one-dimensional groundwater model (Table 13.3.9.2-2) represent available literature data, and the model aggregates these value ranges into a simplistic representation of the aquifer.

Currently, depth to groundwater in the basin-fill aquifer is on the order of 600 ft (183 m) in the vicinity of the SEZ. The connectivity between the basin-fill and the regional-scale carbonate rock aquifer, which lies underneath the basin and outcrops along the Wah Wah Mountains as the source water for the Wah Wah Springs area, is not fully realized. Modeling results suggest that groundwater withdrawals for solar energy development would result in groundwater drawdown in the vicinity of the SEZ (approximately a 2-mi [3.2-km] radius) ranging up to 100 ft (30 m) for the high pumping scenario, 15 ft (5 m) for the medium pumping scenario, and less than 1 ft (0.3 m) for the low pumping scenario (Figure 13.3.9.2-2). The modeled groundwater drawdown is primarily limited to a 3-mi (5-km) radius of the SEZ for all pumping scenarios; however, the Wah Wah Springs discharge area is located 2 mi (3.2 km) to the west of the SEZ, and groundwater drawdown could affect this spring discharge area.

TABLE 13.3.9.2-1 Groundwater Budget for the Wah Wah Valley Groundwater Basin, Which Includes the Proposed Wah Wah Valley SEZ as Revised

Process	Amount
Inputs	
Precipitation recharge (ac-ft/yr)[a]	5,400
Underflow from Pine Valley (ac-ft/yr)	16,600
Outputs	
Underflow to Sevier Desert (ac-ft/yr)	10,800
Underflow to Tule Valley (ac-ft/yr)	9,900
Discharge to springs[b] (ac-ft/yr)	24
Discharge to Wah Wah Springs (ac-ft/yr)	1,161

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

[b] Includes Antelope Spring, Kiln Spring, and Will Creek Spring.

Source: Durbin and Loy (2010).

TABLE 13.3.9.2-2 Aquifer Characteristics and Assumptions Used in the One-Dimensional Groundwater Model for the Proposed Wah Wah Valley SEZ as Revised

Parameter	Value
Aquifer type/conditions	Unconfined/basin fill
Aquifer thickness (ft)[a]	1,000
Hydraulic conductivity (ft/day)	6.6
Transmissivity (ft^2/day)	6,620
Specific yield	0.15
Analysis period (yr)	20
High pumping scenario (ac-ft/yr)[b]	4,892
Medium pumping scenario (ac-ft/yr)	697
Low pumping scenario (ac-ft/yr)	28

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

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

Source: Durbin and Loy (2010).

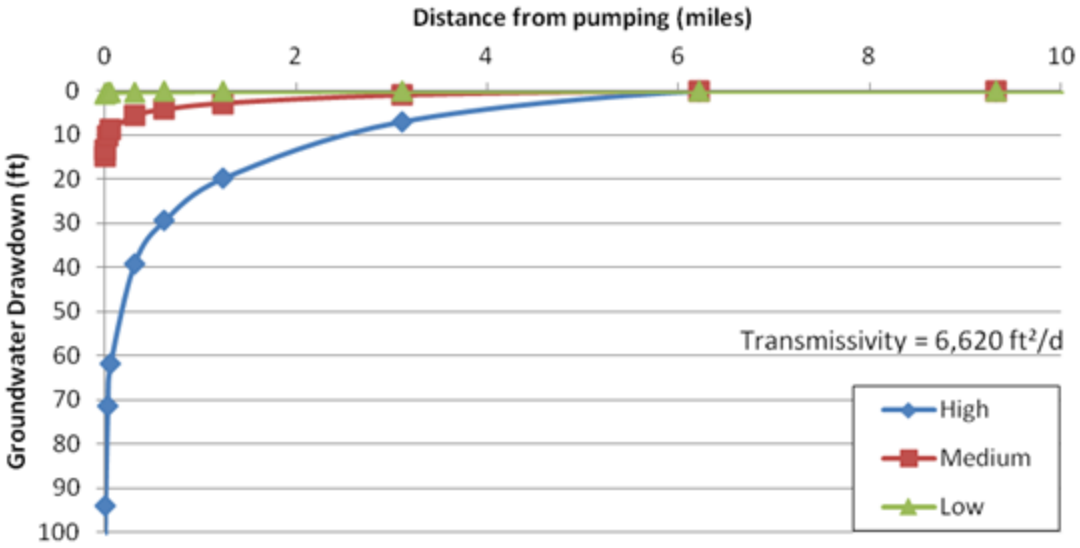

FIGURE 13.3.9.2-2 Estimated One-Dimensional Groundwater Drawdown Resulting from High, Medium, and Low Groundwater Pumping Scenarios over the 20-Year Operational Period at the Proposed Wah Wah Valley SEZ as Revised

13.3.9.2.3 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.

13.3.9.2.4 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 indicate that the Wah Wah Valley SEZ is located in high-elevation desert valley with intermittent/ephemeral surface water features, and groundwater is contained in a basin-fill aquifer overlaying a regional-scale carbonate rock aquifer system. The depth to groundwater, more than 600 ft (183 m), suggests limited groundwater availability in the basin, but the potential for connectivity with the regional-scale carbonate rock aquifer system has generated two pending water right applications with a combined groundwater withdrawal rate of more than 15,000 ac-ft/yr (18.5 million m^3/yr). Information regarding these pending water right applications is described in Section 13.3.9.1.3 of the Draft Solar PEIS, and these applications are currently under review by the Utah DWR.

Disturbances to intermittent/ephemeral streams within the Wah Wah Valley SEZ could potentially affect natural drainage patterns along Wah Wah Wash, causing an increase in sedimentation and erosion of this incised channel. Channel reaches that drain the Wah Wah Mountains and just along the western edge of the SEZ have a high sensitivity to land disturbance and could disrupt groundwater recharge processes. While several design features described in Appendix A of this Final Solar PEIS attempt to protect and mitigate impacts on intermittent/ephemeral streams, additional protection is provided by the Utah DWR's Stream Allocation permitting program.

The analysis of water use requirements in comparison to the basin-scale groundwater budget and groundwater modeling analyses suggest that the low and medium pumping scenarios are preferred. The high pumping scenario has groundwater withdrawal rates that match precipitation recharge to the basin and can potentially cause groundwater drawdown in the vicinity of the Wah Wah Springs discharge area, which is connected to the regional-scale carbonate rock aquifer. The availability of groundwater in the Wah Wah Valley will largely depend on the outcome of the two large water right applications that are currently being reviewed by the Utah DWR.

Predicting impacts associated with groundwater withdrawals 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 groundwater modeling framework developed by Durbin and Loy (2010) for the regional-scale carbonate rock aquifer in this region should be used as a basis to evaluate project-specific development plans, along with supporting long-term monitoring and adaptive management plans for the Wah Wah Valley SEZ.

13.3.9.3 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 and consideration of comments received as applicable, the following SEZ-specific design features for water resources have been identified:

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

- During site characterization, coordination and permitting with Utah DWR regarding Utah's Stream Alteration Program would be required for any proposed alterations to surface water features.

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.

13.3.10 Vegetation

13.3.10.1 Affected Environment

In the Supplement to the Draft Solar PEIS, 224 acres (0.91 km^2) of the Wah Wah Wash was identified as a non-development area in the Wah Wah Valley SEZ.

As presented in the Draft Solar PEIS, 8 cover types were identified within the area of the proposed Wah Wah Valley SEZ, while 29 cover types were identified within the area of indirect effects, including the assumed transmission line corridor and within 5 mi (8 km) of the SEZ boundary. For this updated assessment, a specifically located hypothetical transmission line is no longer being assumed (see Section 13.3.23 for an updated transmission assessment for this SEZ). Sensitive habitats on the SEZ include ephemeral dry wash and playa habitats. Figure 13.3.10.1-1 shows the cover types within the affected area of the Wah Wah Valley SEZ as revised.

13.3.10.2 Impacts

As presented in the Draft Solar PEIS, the construction of solar energy facilities within the proposed Wah Wah Valley 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. With consideration of the newly identified non-development area, approximately 4,698 acres (19.01 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.

13.3.10.2.1 Impacts on Native Species

The analysis presented in the Draft Solar PEIS for the original Wah Wah Valley SEZ developable area indicated that development would result in a small impact on all land cover types occurring within the SEZ (Table 13.3.10.1-1 in the Draft Solar PEIS). Development within the revised Wah Wah Valley SEZ could still directly affect all the cover types evaluated in the

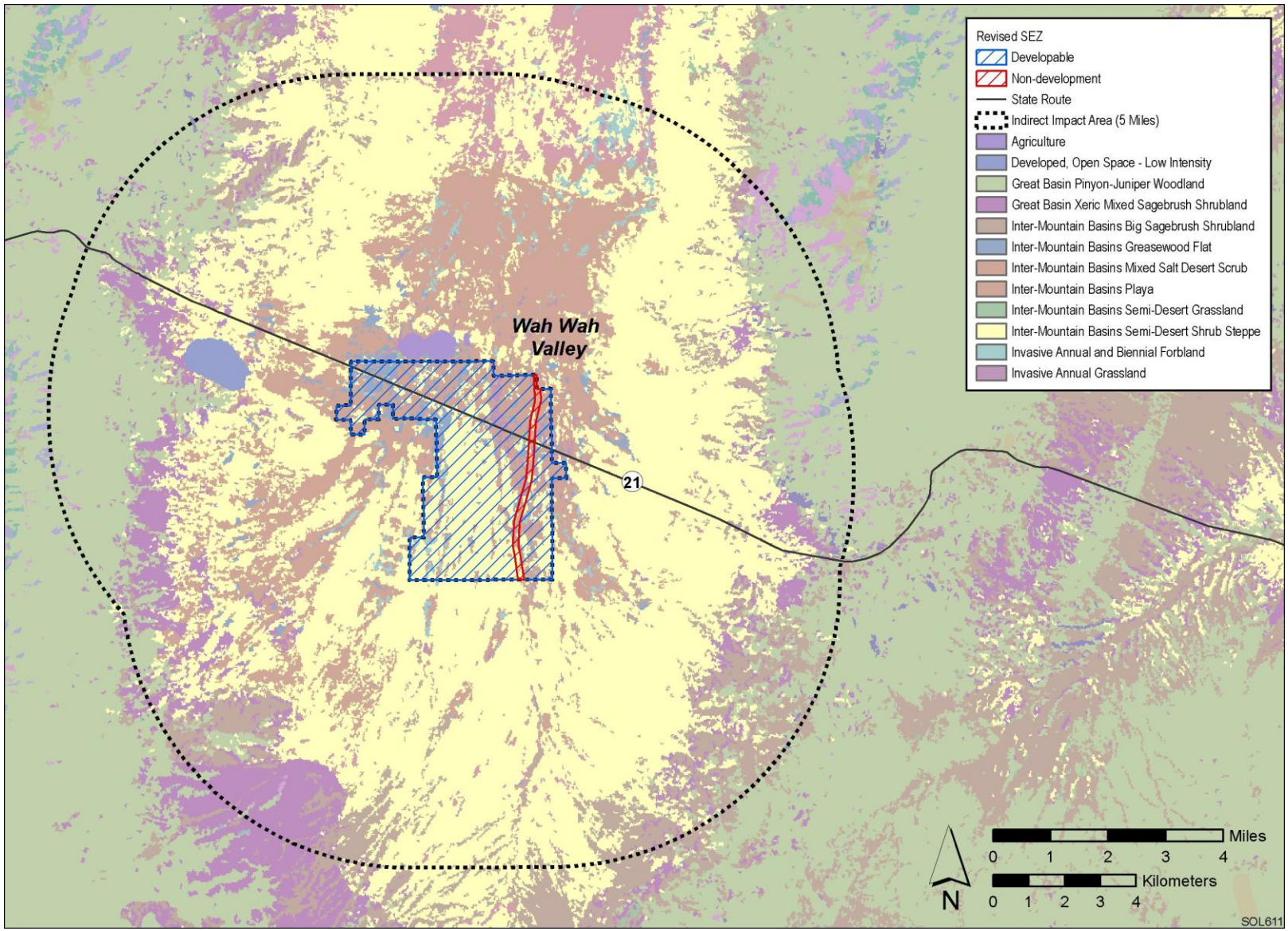

FIGURE 13.3.10.1-1 Land Cover Types within the Proposed Wah Wah Valley SEZ as Revised

Draft Solar PEIS; the reduction in the developable area would result in reduced impact levels on most land cover types in the affected area, but the impact magnitudes would remain unchanged compared to original estimates in the Draft Solar PEIS.

Because Wah Wah Wash has been identified as a non-development area, direct impacts on the wash would not occur, although indirect impacts could still occur. Because a specific transmission line route is no longer assumed, direct impacts on habitats that occur within the previously identified transmission corridor also would not occur. As a result, direct impacts on 19 cover types that were present only within the transmission corridor, would not occur. However, direct and indirect impacts on plant communities associated with playa habitats, greasewood flats, or other intermittently flooded areas, or dry washes, within or near the SEZ, as described in the Draft Solar PEIS, could still occur. Indirect impacts from groundwater use on plant communities in the region that depend on groundwater, such as riparian communities associated with springs, could also occur.

13.3.10.2.2 Impacts from Noxious Weeds and Invasive Plant Species

As presented in the Draft Solar PEIS, land disturbance from project activities and indirect effects of construction and operation within the Wah Wah Valley SEZ could potentially result in the establishment or expansion of noxious weeds and invasive species populations, potentially including those species listed in Section 13.3.10.1 in the Draft Solar PEIS. Such impacts 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.

13.3.10.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features 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 dry wash and playa habitats within the SEZ shall be avoided to the extent practicable, and any impacts should be minimized and mitigated in consultation with appropriate agencies. A buffer area shall be maintained around dry washes and playa habitats to reduce the potential for impacts.

- Appropriate engineering controls shall be used to minimize impacts on dry wash, playa, and greasewood flat 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 will be determined through agency consultation.

- Groundwater studies shall be conducted to evaluate the potential for indirect impacts on springs located in the vicinity of the SEZ or those in hydrologically connected basins.

It is anticipated that implementation of these programmatic design features will reduce a high potential for impacts from invasive species and impacts on dry washes, playas, and springs to a minimal potential for impact.

On the basis of impact analyses conducted for the Draft Solar PEIS 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.

13.3.11 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.

13.3.11.1 Amphibians and Reptiles

13.3.11.1.1 Affected Environment

As presented in the Draft Solar PEIS, representative amphibian and reptile species expected to occur within the Wah Wah Valley SEZ include the Great Basin spadefoot (*Spea intermontana*), Great Plains toad (*Bufo cognatus*), sagebrush lizard (*Sceloporus graciosus*), desert horned lizard (*Phrynosoma platyrhinos*), eastern fence lizard (*S. undulatus*), gophersnake (*Pituophis catenifer*), greater short-horned lizard (*Phrynosoma hernandesi*), long-nosed leopard lizard (*Gambelia wislizenii*), nightsnake (*Hypsiglena torquata*), tiger whiptail (*Aspidoscelis tigris*), and wandering gartersnake (*Thamnophis elegans vagrans*, a subspecies of terrestrial gartersnake).

13.3.11.1.2 Impacts

As presented in the Draft Solar PEIS, solar energy development within the Wah Wah Valley SEZ could affect potentially suitable habitats for the representative amphibian and reptile species. The analysis presented in the Draft Solar PEIS indicated that development would result in a small overall impact on the representative amphibian and reptile species (Table 13.3.11.1-1 in the Draft Solar PEIS). The reduction in the developable area of the Wah Wah Valley SEZ

would result in reduced habitat impacts for all representative amphibian and reptile species; the resultant impact levels for all the representative species would be small.

13.3.11.1.3 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 the implementation of required programmatic design features, impacts on amphibian and reptile species will be reduced.

Because of changes to the developable areas within the SEZ boundaries, the SEZ-specific design feature identified in the Draft Solar PEIS (i.e., the Wah Wah Wash should be avoided) is no longer applicable. On the basis of impact analyses conducted for the Draft Solar PEIS 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.

13.3.11.2 Birds

13.3.11.2.1 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 Wah Wah Valley SEZ. Representative bird species identified in the Draft Solar PEIS included (1) passerines: Bewick's wren (*Thryomanes bewickii*), Brewer's sparrow (*Spizella breweri*), common raven (*Corvus corax*), gray flycatcher (*Empidonax wrightii*), greater roadrunner (*Geococcyx californianus*), horned lark (*Eremophila alpestris*), Le Conte's thrasher (*Toxostoma leconteii*), loggerhead shrike (*Lanius ludovicianus*), rock wren (*Salpinctes obsoletus*), sage sparrow (*Amphispiza belli*), sage thrasher (*Oreoscoptes montanus*), vesper sparrow (*Pooecetes gramineus*), and western kingbird (*Tyrannus verticalis*); (2) raptors: American kestrel (*Falco sparverius*), golden eagle (*Aquila chrysaetos*), red-tailed hawk (*Buteo jamaicensis*), rough-legged hawk (*Buteo lagopus*, only during winter), Swainson's hawk (*Buteo swainsoni*), and turkey vulture (*Cathartes aura*); and (3) upland gamebirds: chukar (*Alectoris chukar*), mourning dove (*Zenaida macroura*), and wild turkey (*Meleagris gallopavo*).

13.3.11.2.2 Impacts

As presented in the Draft Solar PEIS, solar energy development within the Wah Wah Valley SEZ could affect potentially suitable bird habitats. The analysis presented in the Draft Solar PEIS indicated that development would result in a small overall impact on the representative bird species (Table 13.3.11.2-1 in the Draft Solar PEIS). The reduction in the

developable area of the Wah Wah Valley SEZ would result in reduced habitat impacts for all representative bird species; however, the resultant impact levels for all the representative bird species would be small.

13.3.11.2.3 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. With implementation of required programmatic design features and the applicable SEZ-specific design features, impacts on bird species will be reduced.

Because of the reduction in the developable area within the SEZ, one of the SEZ-specific design feature identified in Section 13.3.11.2.3 of the Draft Solar PEIS (i.e., the Wah Wah Wash should be avoided) is no longer applicable. On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, the following SEZ-specific design feature for bird species has been identified:

- The steps outlined in the *Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances* (Romin and Muck 1999) should be followed.

If SEZ-specific design features are implemented in addition to required programmatic design features, impacts on bird 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.

13.3.11.3 Mammals

13.3.11.3.1 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 Wah Wah Valley SEZ. Representative mammal species identified in the Draft Solar PEIS included (1) big game species: American black bear (*Ursus americanus*), cougar (*Puma concolor*), elk (*Cervis canadensis*), mule deer (*Odocoileus hemionus*), and pronghorn (*Antilocapra americana*); (2) furbearers and small game species: American badger (*Taxidea taxus*), black-tailed jackrabbit (*Lepus californicus*), coyote (*Canis latrans*), and desert cottontail (*Sylvilagus audubonii*); and (3) small nongame species: desert woodrat (*Neotoma lepida*), Great Basin pocket mouse (*Perognathus parvus*), least chipmunk (*Neotamias minimus*), northern grasshopper mouse (*Onychomys leucogaster*), sagebrush vole (*Lemmiscus curtatus*), and white-tailed antelope squirrel (*Ammospermophilus leucurus*). Bat species that may occur within the area of the SEZ include the Brazilian free-tailed bat (*Tadarida brasiliensis*), little brown myotis (*Myotis lucifugus*), long-legged myotis (*M. volans*), and western pipistrelle (*Parastrellus hesperus*).

However, roost sites for the bat species (e.g., caves, hollow trees, rock crevices, or buildings) would be limited to absent within the SEZ.

13.3.11.3.2 Impacts

As presented in the Draft Solar PEIS, solar energy development within the Wah Wah Valley SEZ could affect potentially suitable habitats of mammal species. The analysis presented in the Draft Solar PEIS indicated that development would result in a small overall impact on the representative mammal species (Table 13.3.11.3-1 in the Draft Solar PEIS). The reduction in the developable area of the Wah Wah Valley SEZ would result in reduced habitat impacts for all representative mammal species; resultant impact levels for all the representative mammal species would be small. On the basis of mapped activity areas, direct potential loss of crucial pronghorn range would be reduced from 4,878 acres (20 km^2) to 4,698 acres (19 km^2). No mapped cougar habitat or crucial habitat for the other big game species occurs within the SEZ. Direct impact levels for these big game mapped habitat areas would be small (pronghorn) to none (other big game species).

13.3.11.3.3 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 required programmatic design features and the applicable SEZ-specific design feature, impacts on mammal species will be reduced.

Because of changes in the developable area within the boundary of the SEZ, one of the SEZ-specific design features identified in the Draft Solar PEIS (i.e., the Wah Wah Wash should be avoided) is no longer applicable. On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, the following SEZ-specific design feature for mammal species has been identified:

- The intermontane basin big sagebrush shrubland land cover type in the southeastern portion of the SEZ, which is the only identified suitable land cover type for the elk and sagebrush vole and about a third of the suitable habitat for the American black bear in the SEZ, should be avoided.

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.

13.3.11.4 Aquatic Biota

13.3.11.4.1 Affected Environment

No permanent water bodies or perennial streams occur within the boundaries of the Wah Wah Valley SEZ. Because the boundaries of the Wah Wah Valley SEZ given in the Draft Solar PEIS have not changed, the amount of surface water features within the area of direct and indirect effects is still valid. Updates to the Draft Solar PEIS include the following:

- The 4-mi (6-km) segment of Wah Wah Wash located within the eastern portion of the SEZ has been identified as a non-development area.

- The route of a new transmission line described in the Draft Solar PEIS is no longer assumed.

Aquatic biota present in the surface water features in the Wah Wah Valley SEZ have not been characterized. 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 the aquatic biota, if present, in Wah Wah Wash.

13.3.11.4.2 Impacts

The types of impacts from the development of utility-scale solar energy facilities that could affect aquatic habitats and biota 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 segment of Wah Wah Wash located within the SEZ has been identified as a non-development area; therefore, construction activities would not directly affect Wah Wah Wash. However, as described in the Draft Solar PEIS, Wah Wah Wash could be affected indirectly by solar development activities within the SEZ.

- The route of a new transmission line described in the Draft Solar PEIS is no longer assumed; therefore the impacts on the Beaver River from the transmission line crossing described in the Solar Draft PEIS are no longer assumed to occur.

13.3.11.4.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on aquatic biota 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 shall be implemented to minimize the amount of contaminants and sediment entering Wah Wah Wash.

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 Wah Wah Valley SEZ would be small.

On the basis of impact analyses conducted for the Draft Solar PEIS 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.

13.3.12 Special Status Species

13.3.12.1 Affected Environment

Twenty-two special status species were identified in the Draft Solar PEIS that could occur or have potentially suitable habitat within the affected area of the proposed Wah Wah Valley SEZ. The transmission assessment for the Wah Wah Valley SEZ has been updated, and the specific route and land disturbance of a hypothetical transmission corridor are no longer being assumed (see Section 13.3.23 for an updated transmission assessment for this SEZ). There were no additional special status species identified that could occur in the SEZ affected area. However, the reduction in the developable area of the Wah Wah Valley SEZ and elimination of the analysis for the hypothetical transmission corridor reduces or eliminates the potential for several species and their habitat to occur in the SEZ affected area. As presented in Table 13.3.12.1-1 of the Draft Solar PEIS, special status species that were previously determined to occur only outside of the SEZ within the assumed transmission corridor and area of indirect effects include the following six species: (1) plants: Frisco buckwheat (*Eriogonum soredium*), Frisco clover (*Trifolium friscanum*), Ostler's ivesia (*Ivesia Shockley ostleri*); (2) birds: greater sage-grouse (*Centrocercus urophasianus*) and northern goshawk (*Accipiter gentilis*); and (3) mammals: pygmy rabbit (*Brachylagus idahoensis*). With the elimination of the analysis for the hypothetical transmission corridor, it is assumed that these six species have the potential to occur only in the area of indirect effects of the Wah Wah Valley SEZ.

The previously assumed transmission corridor was determined to intersect approximately 5,800 acres (23 km^2) of crucial brooding habitat for the greater sage-grouse. With the

elimination of analysis for the hypothetical transmission corridor, no crucial brooding habitat for the greater sage-grouse is assumed to occur in the affected area of the Wah Wah Valley SEZ.

13.3.12.2 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 Wah Wah Valley SEZ could affect potentially suitable habitats of special status species. The analysis presented in the Draft Solar PEIS for the original Wah Wah Valley SEZ developable area indicated that development would result in no impact or a small overall impact on all special status species (Table 13.3.12.1-1 in the Draft Solar PEIS). Development within the SEZ could still affect the same 22 special status species evaluated in the Draft Solar PEIS; however, the reduction in the developable area and elimination of the analysis for the hypothetical transmission corridor would result in reduced (but still small) impact levels compared to original estimates in the Draft Solar PEIS.

As presented in the Draft Solar PEIS, special status species that were previously determined to only occur outside of the SEZ within the hypothetical transmission corridor and area of indirect effects include the following six species: (1) plants: Frisco buckwheat, Frisco clover, Ostler's ivesia; (2) birds: greater sage-grouse and northern goshawk; and (3) mammals: pygmy rabbit. With the elimination of analysis for the hypothetical transmission corridor, it is assumed that these six species have the potential to occur only in the area of indirect effects of the Wah Wah Valley SEZ. Therefore, only indirect effects on these species are assumed to be possible. Indirect impacts on these species are expected to be reduced to negligible levels with the implementation of programmatic and SEZ-specific design features.

13.3.12.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features are described in Section A.2.2 of Appendix A of the Draft Solar PEIS. SEZ-specific resources and conditions will guide how programmatic design features are applied, for example:

- Pre-disturbance surveys shall be conducted to determine the presence and abundance of special status species, including those identified in Table 13.3.12.1-1 of the Draft Solar PEIS. Disturbance to occupied habitats for these species shall be avoided or impacts on occupied habitats minimized to the extent practicable. If avoiding or minimizing impacts on occupied habitats is not possible, translocation of individuals from areas of direct effect 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 prepared in coordination with the appropriate federal and state agencies.

- Consultations with the USFWS and the UDWR shall be conducted to address the potential for impacts on the Utah prairie dog (*Cynomys parvidens*), a species listed as threatened under the ESA. 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.

- Coordination with the USFWS and UDWR shall be conducted to address the potential for impacts on the greater sage-grouse—a candidate species for listing under the ESA. Coordination with the USFWS and UDWR shall also be conducted for the following species that are under review for listing under the ESA: Frisco buckwheat, Frisco clover, and Ostler's pepper-grass. Coordination with the USFWS and UDWR would identify an appropriate pre-disturbance survey protocol, avoidance measures, and any potential compensatory mitigation actions for each of these species.

It is anticipated that the 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 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. Projects will comply with terms and conditions set forth by the USFWS Biological Opinion resulting from programmatic consultation and any necessary project-specific ESA Section 7 consultations.

13.3.13 Air Quality and Climate

13.3.13.1 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.

13.3.13.1.1 Existing Air Emissions

The Draft Solar PEIS presented Beaver County emissions data for 2002. More recent data for 2008 (UDEQ 2010) were reviewed. The two emissions inventories are from different sources

and assumptions. In the more recent data, emissions of SO_2, NO_x, CO, and VOCs were lower, while PM_{10} and $PM_{2.5}$ emissions were higher. These changes would not affect modeled air quality impacts presented in this update.

13.3.13.1.2 Air Quality

The calendar quarterly average NAAQS of 1.5 µg/m^3 for lead (Pb) presented in Table 13.3.13.1-2 of the Draft Solar PEIS has been replaced by the rolling 3-month standard (0.15 µg/m^3). The federal 24-hour and annual SO_2, 1-hour O_3, and annual PM_{10} standards have been revoked as well (EPA 2011). Utah adopts the NAAQS; thus, Utah SAAQS will reflect the same changes. These changes will not affect the modeled air quality impacts presented in this update.

Because the boundaries of the proposed Wah Wah Valley SEZ have not changed, the distances to the nearest Class I areas are the same as presented in the Draft Solar PEIS. There are several Class I areas around the proposed Wah Wah Valley SEZ, none of which are situated within 62 mi (100 km). The nearest Class I area is Zion NP, about 65 mi (105 km) south–southeast of the SEZ, and the other nearby Class I areas include Bryce Canyon NP and Capital Reef NP, about 85 mi (136 km) southeast and 105 mi (169 km) east–southeast of the SEZ, respectively.

13.3.13.2 Impacts

13.3.13.2.1 Construction

Methods and Assumptions

The methods and modeling assumptions remain the same as presented in the Draft Solar PEIS. The area of the proposed Wah Wah Valley SEZ was reduced by less than 4%, from 6,097 acres (24.7 km^2) to 5,873 acres (23.8 km^2). This small reduction would have a negligible impact on air quality; thus, impacts were not remodeled.

Results

Because the annual PM_{10} standard has been rescinded, the discussion of annual PM_{10} impacts in the Draft Solar PEIS is no longer applicable, and Table 13.3.13.2-1 has been updated for this Final Solar PEIS. The tabulated concentrations as presented in the Draft Solar PEIS remain valid.

TABLE 13.3.13.2-1 Maximum Air Quality Impacts from Emissions Associated with Construction Activities for the Proposed Wah Wah Valley SEZ as Revised

			Concentration ($\mu g/m^3$)				Percentage of NAAQS	
Pollutant[a]	Averaging Time	Rank[b]	Maximum Increment[b]	Background[c]	Total	NAAQS	Increment	Total
PM_{10}	24-hour	H6H	576	83	659	150	384	439
$PM_{2.5}$	24-hour	H8H	42.0	18	60.0	35	120	171
	Annual	NA[d]	8.8	8	16.8	15	58	112

[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 13.3.13.1-2 of the Draft Solar PEIS (Prey 2009).

[d] NA = not applicable.

Because the air quality impacts remain the same as those presented in the Draft Solar PEIS, the conclusions presented there remain valid.[2] Predicted 24-hour PM_{10} and 24-hour and annual $PM_{2.5}$ concentration levels could exceed the standard levels used for comparison at the SEZ boundaries and in the immediate surrounding areas during the construction of solar facilities. To reduce potential impacts on ambient air quality and in compliance with programmatic design features, aggressive dust control measures would be used.

At the nearest residence located adjacent to the northern boundary of the SEZ, the predicted maximum 24-hour concentration increment from construction activities is about 353 $\mu g/m^3$, above the standard level used for comparison, and the predicted maximum 24-hour and annual $PM_{2.5}$ concentration increments would be about 28 and 5.1 $\mu g/m^3$, respectively.

Modeling indicates that emissions from construction activities are not anticipated to exceed Class I PSD PM_{10} increments at the nearest federal Class I area (Zion NP). Construction activities are not subject to the PSD program, and the comparison provides only a screen to

[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 so on, is not known; thus air quality modeling cannot be conducted. It has been assumed that an area of 3,000 acres (12.1 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 presented in this Final Solar PEIS.

gauge the size of the impact. Overall, it is anticipated that impacts of construction activities on ambient air quality would be moderate and temporary.

Because the same area is assumed to be disturbed in the Draft Solar PEIS and this Final Solar PEIS, emissions from construction equipment and vehicles would be the same as those discussed in the Draft Solar PEIS and the conclusions of the Draft Solar PEIS remain valid. Construction emissions from the engine exhaust from heavy equipment and vehicles could cause impacts on AQRVs (e.g., visibility and acid deposition) at the nearest federal Class I area, Zion NP, which is not located directly downwind of prevailing winds. Construction-related emissions are temporary and thus would cause some unavoidable but short-term impacts.

13.3.13.2.2 Operations

The change in the developable area of the proposed Wah Wah Valley SEZ by less than 4%, from 6,097 acres (24.7 km^2) to 5,873 acres (23.8 km^2), reduces the generating capacity and annual power generation and thus reduces the potentially avoided emissions presented in the Draft Solar PEIS. Total revised power generation capacity ranging from 522 to 940 MW is estimated for the Wah Wah Valley SEZ for various solar technologies. 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 avoided.

Table 13.3.13.2-2 in the Draft Solar PEIS provided estimates for emissions potentially avoided by a solar facility. Those estimates were updated by reducing the tabulated estimates by 3.68%, as shown in the revised Table 13.3.13.2-2. For example, for the technologies estimated to require 9 acres/MW (power tower, dish engine, and PV), up to 1,741 tons of NO_x per year (= 96.32% × the value of 1,807 tons per year tabulated in the Draft Solar PEIS) could be avoided by full solar development of the proposed Wah Wah Valley SEZ as revised for this Final Solar PEIS. Because the total emissions potentially avoided by full solar development of the proposed Wah Wah Valley SEZ are about the same as those presented in the Draft Solar PEIS, the conclusions of the Draft Solar PEIS remain valid. Full solar development of the proposed Wah Wah Valley SEZ could result in substantial avoided emissions. Solar facilities to be built in the Wah Wah Valley SEZ could avoid relatively more fossil fuel emissions than those built in other states that rely less on fossil fuel–generated power.

13.3.13.2.3 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.

TABLE 13.3.13.2-2 Annual Emissions from Combustion-Related Power Generation Avoided by Full Solar Development of the Proposed Wah Wah Valley 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
5,873	522–940	915–1,646	910–1,638	1,741–3,133	0.004–0.006	987–1,776
Percentage of total emissions from electric power systems in the state of Utah[e]			2.5-4.4%	2.5-4.4%	2.5-4.4%	2.5-4.4%
Percentage of total emissions from all source categories in the state of Utah[f]			1.7–3.0%	0.71–1.3%	–[g]	1.4-2.4%
Percentage of total emissions from electric power systems in the six-state study area[e]			0.36–0.65%	0.47–0.85%	0.12–0.22%	0.38–0.68%
Percentage of total emissions from all source categories in the six-state study area[f]			0.19–0.35%	0.06–0.12%	–	0.12–0.21%

[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 1.99, 3.81, 7.8×10^{-6}, and 2,158 lb/MWh, respectively, were used for the state of Utah.

[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] NA = not estimated.

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

13.3.13.3 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 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.

13.3.14 Visual Resources

13.3.14.1 Affected Environment

No boundary revisions were identified for the proposed Wah Wah Valley SEZ in the Supplement to the Draft Solar PEIS; however, 224 acres (0.91 km^2) of Wah Wah Wash was identified as a non-development area. The remaining developable area within the SEZ is 5,873 acres (23.8 km^2).

13.3.14.2 Impacts

The summary of impacts provided in the Draft Solar PEIS remains valid, as follows. The SEZ is in an area of low scenic quality. Residents, workers, and visitors to the area may experience visual impacts from solar energy facilities located within the SEZ (as well as any associated access roads and transmission lines) as they travel area roads. The residents nearest to the SEZ could be subjected to large visual impacts from solar energy development within the SEZ. State Route 21 passes through the SEZ, and travelers on that road could be subjected to very strong visual contrasts from solar development within the SEZ, but typically their exposure would be brief.

Utility-scale solar energy development within the proposed Wah Wah Valley SEZ could cause moderate levels of visual contrast as observed from the Wah Wah Mountains WSA at distances between 5 and 10 mi (8 and 16 km) from the SEZ. A very small portion of the King Top WSA is within the viewshed of the SEZ, but it is too far away to be affected significantly by visual impacts resulting from solar development within the SEZ. The closest community is more than 25 mi (40 km) from the SEZ, and therefore is likely to experience minimal or no visual impacts from solar development within the SEZ.

13.3.14.3 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 the impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features for visual 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.

13.3.15 Acoustic Environment

13.3.15.1 Affected Environment

The developable area of the proposed Wah Wah Valley SEZ was reduced by less than 4%, from 6,097 acres (24.7 km^2) to 5,873 acres (23.8 km^2). The boundaries of the SEZ were not changed; thus the information for acoustic environment remains the same as presented in the Draft Solar PEIS.

13.3.15.2 Impacts

The small reduction in the developable area of the SEZ would cause only a negligible reduction in predicted noise levels from construction and operations. The conclusions presented in the Draft Solar PEIS remain valid.

13.3.15.2.1 Construction

The conclusions in the Draft Solar PEIS remain valid. For construction activities occurring near the northern SEZ boundary, estimated noise levels at the nearest residence (adjacent to the northern SEZ boundary) would be about 74 dBA, which is above the neighboring Iron County regulation level of 50 dBA and above a typical daytime mean rural background level of 40 dBA. The estimated 70 dBA L_{dn} at the residence is well above the EPA guideline of 55 dBA L_{dn} for residential areas.

No specially designated areas are within 5 mi (8 km) of the Wah Wah Valley SEZ, which is the farthest distance at which noise, other than extremely loud noise, would be discernible. Thus, no noise impact analysis for specially designated areas was conducted.

Construction at the Wah Wah Valley SEZ would cause negligible impacts on nearby communities because of considerable separation distances. However, for activities occurring near the northern SEZ boundary, construction would cause unavoidable but localized short-term noise impacts on the nearest residence.

No adverse vibration impacts are anticipated from construction activities except for pile driving, which could affect the nearest residence when it occurs near the residence along the northern border of the SEZ.

13.3.15.2.2 Operations

Because of the small reduction in developable area, conclusions presented in the Draft Solar PEIS remain valid.

Parabolic Trough and Power Tower

For operating parabolic trough and power tower technologies along the northern boundary of the SEZ, the predicted noise level would be about 51 dBA at the nearest residence; this noise level is comparable to the neighboring Iron County regulation of 50 dBA and above the typical daytime mean rural background level of 40 dBA. If TES were not used, the EPA guideline level of 55 dBA L_{dn} would not be exceeded outside the SEZ boundary, including at the nearest residence. If TES were used, the estimated nighttime noise level at the nearest residence would be about 61 dBA, higher than both the neighboring Iron County regulation of 50 dBA and the typical nighttime mean rural background level of 30 dBA. The day-night average noise level would be about 63 dBA L_{dn}, higher than the EPA guideline of 55 dBA L_{dn} for residential areas. Thus, operating parabolic trough or power tower facilities using TES and located near the northern SEZ boundary could result in adverse noise impacts on the nearest residence, depending on background noise levels and meteorological conditions. In the permitting process, refined noise propagation modeling would be warranted along with measurement of background noise levels.

Dish Engines

For operating dish engine facilities, the estimated noise level at the nearest residence adjacent to the northern boundary would be about 58 dBA, above both the neighboring Iron County regulation level of 50 dBA and the typical daytime mean rural background level of 40 dBA. For 12-hour daytime operations, the estimated 55 dBA L_{dn} at the residence is equivalent to the EPA guideline for residential areas. Thus, a dish engine facility near the northern SEZ boundary, close to the nearest residence, could result in adverse impacts on the residence, depending on background noise levels and meteorological conditions. Consideration of minimizing noise impacts is very important in the siting of dish engine facilities. Direct mitigation of dish engine noise through noise control engineering could also limit noise impacts.

During operation of any solar facility, potential vibration impacts on surrounding communities and vibration-sensitive structures would be minimal.

The discussions of vibration, transformer and switchyard noise, and transmission line corona discharge presented in the Draft Solar PEIS remain valid. Noise impacts from these sources would be minimal to negligible.

13.3.15.2.3 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 minor and temporary. Potential vibration impacts on surrounding communities and vibration-sensitive structures would be minimal.

13.3.15.3 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 and consideration of comments received as applicable, no SEZ-specific design features were identified for noise. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

13.3.16 Paleontological Resources

13.3.16.1 Affected Environment

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

- The BLM Regional Paleontologist may have additional information regarding the paleontological potential of the SEZ and be able to verify the PFYC of the SEZ as Class 2 as used in the Draft Solar PEIS.

13.3.16.2 Impacts

Few, if any, impacts on significant paleontological resources are likely to occur in the proposed Wah Wah Valley SEZ. However, a more detailed look at the geological deposits of the SEZ is needed to determine whether a paleontological survey is warranted. The assessment provided in the Draft Solar PEIS remains valid.

13.3.16.3 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, and consideration of comments received as applicable, no SEZ-specific design features for paleontological resources have been identified. If the geological deposits are determined to be as described above and remain classified as PFYC Classes 1 and 2, SEZ-specific design features for mitigating impacts on paleontological resources within the Wah Wah Valley SEZ and associated ROWs are not likely to be necessary. Therefore, the need for and nature of any SEZ-specific design features for the SEZ would depend on the results 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 on the project Web site (http://solareis.anl.gov) for use by applicants, the BLM, and other stakeholders.

13.3.17 Cultural Resources

13.3.17.1 Affected Environment

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

- A tribally approved ethnographic study of the proposed Wah Wah Valley SEZ was conducted (SWCA and University of Arizona 2011), and a summary of that study was presented in the Supplement to the Draft Solar PEIS. New cultural landscapes, important water sources, and traditional plants and animals were identified (see Section 13.3.18 for a description of the latter). The completed ethnographic study is available in its entirety on the Solar PEIS Web site (http://solarpeis.anl.gov).

- Tribal representatives of the Confederated Tribes of the Goshute Reservation and the Paiute Indian Tribe of Utah stated that the Wah Wah Valley is part of a large ceremonial landscape that includes important geological features, such as the Wah Wah Mountains, Wallaces Peak, Wah Wah Springs, Seiver Lake, and important volcanic features.

- 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 I literature file search to better understand (1) the site distribution pattern in the vicinity of the SEZ, (2) potential trail networks through existing ethnographic reports, and (3) overall cultural sensitivity of the landscape.

- Results of a Class II reconnaissance-level stratified random sample survey of the SEZ with a goal of achieving a 10% sample (roughly 587 acres [2.38 km^2]) as funding to support additional Class II sample inventories in the SEZ areas becomes available. Areas of interest, such as dune areas and along washes, as determined through a Class I review, should also be identified prior to establishing the survey design and sampling strategy. If appropriate, some subsurface testing of dune and/or colluvium areas should be considered in the sampling strategies for future surveys. The sample inventory combined with the Class I review would be used to project cultural sensitivity zones as an aid in planning future solar developments.
- 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 2011c), including follow-up to recent ethnographic studies with tribes not included in the original studies to determine whether those tribes have similar concerns.

13.3.17.2 Impacts

As stated in the Draft Solar PEIS, direct impacts on significant cultural resources could occur in the proposed Wah Wah Valley SEZ. The potential for impacts on cultural resources is believed to be low; however, further investigation is needed.

13.3.17.3 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 surveys, evaluations, and consultations will occur.

On the basis of impact analyses conducted for the Draft Solar PEIS, consideration of comments received as applicable, and a review of the ethnographic report, no SEZ-specific design features for cultural resources have been identified. SEZ-specific design features would be determined in consultation with the Utah SHPO and affected tribes and would depend on the results of future investigations. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

13.3.18 Native American Concerns

13.3.18.1 Affected Environment

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

- A tribally approved ethnographic study of the proposed Wah Wah Valley SEZ was conducted (SWCA and University of Arizona 2011), and a summary of that study was presented in the Supplement to the Draft Solar PEIS. New cultural landscapes, important water sources, and traditional plants and animals were identified. The completed ethnographic study is available in its entirety on the Solar PEIS Web site (http://solarpeis.anl.gov).

- Tribal representatives from both the Confederated Tribes of the Goshute Reservation and the Paiute Indian Tribe of Utah believe that all the cultural resources and landscapes within the proposed Wah Wah Valley SEZ are important in helping both tribes understand their past, present, and future.

- Matters of particular concern to the representatives of the Confederated Tribes of the Goshute Reservation are the amount of light that will be reflected off solar panels and the loss of *Puha* (power) that may occur, interfering with prayer and distracting individuals who come to the area to receive a vision; the amount of water needed to sustain a solar energy plant; and the effect on plant and animal life from using a lot of water.

- Tribal representatives of the Confederated Tribes of the Goshute Reservation and the Paiute Indian Tribe of Utah believe the area including and surrounding the proposed Wah Wah Valley SEZ should be managed as a spiritual cultural landscape and that significant areas (e.g., Wah Wah Springs, Sevier Lake, Pleistocene Lake Bonneville, the Wah Wah Mountains, and Wallaces Peak) should be nominated as traditional cultural properties.

- Wah Wah Springs, Sevier Lake, and Lake Bonneville have been identified as important sources of water to the tribes. Wah Wah Springs was identified as an important place of ceremonial, spiritual, and healing activity.

- The Wah Wah Mountains and Wallaces Peak have been identified as important ceremonial and spiritual locations often used for prayer and vision questing.

- Indian Graves Peak was identified as the location of Native American burials.

- Fields of Indian ricegrass have been identified as "traditional crops actively managed and cared for by Indian people" (SWCA and University of Arizona 2011). Tribal representatives have expressed interest in traditionally managing and harvesting these fields.

- Areas that contain evidence of volcanic activity have been identified as culturally important parts of the landscape.

- Several historic events in and around the Escalante Valley have contributed to the history of both tribes. These include the period of European contact,

travel, and exploration, which greatly reduced the Goshute and Paiute traditional use areas (i.e., the establishment of the Old Spanish Trail; the influx of Mormon settlers, and the forty-niner gold rush); the spread of European diseases, which decimated Native American populations; the U.S. Military Conflict of 1863; the forced abandonment of the tribal horticultural way of life into a herding and ranching lifestyle; and the establishment of mines and mining communities in which Native Americans were employed.

- The following traditional plants have been identified in addition to those listed in Table 13.3.18.1-2 of the Draft Solar PEIS: banana yucca (*Yucca baccata*), big sagebrush (*Artemisia tridentate*), black sagebrush (*Artemisia nova*), broom snakeweed (*Gutierrezia sorothrae*), buckbrush (*Purshia glandulosa*), bud sagebrush (*Picrothamnus desertorum*), desert globemallow (*Sphaeralcea ambigua*), desert saltbush (*Atriplex polycarpa*), fishhook cactus (*Escobaria vivipara*), Great Basin gishook cactus (*Sclerocactus pubispinus*), hairspine pricklypear (*Opuntia polyacantha*), hedgehog cactus (*Echinocereus*), Mexican cliffrose (*Purshia Mexicana*), Nevada Indian tea (*Ephedra nevadensis*), orange linchen (*Caloplaca trachyphylla*), ryegrass (*Elymus*), sedge (*Carex* sp.), Spanish bayonet (*Yucca harrimaniae*), Utah juniper (*Juniperus osteoperma*), watercress (*Nasturtium officinale*), and wild carrot (*Lepidium* sp.).

- The following traditional animals have been identified in addition to those listed in Table 13.3.18.1-3 of the Draft Solar PEIS: American black bear (*Ursus americanus*), American badger (*Taxidea taxus*), cougar (*Puma concolor*), elk (*Cervis Canadensis*), American kestrel (*Falco sparverius*), greater roadrunner (*Geococcyx californianus*), loggerhead shrike (*Lanius ludovicianus*), rock wren (*Salpinctes obsoletus*), turkey vulture (*Cathartes aura*), western kingbird (*Tyrannus verticalis*), dragonfly (suborder Anisoptera), and red ants (family Formicidae).

13.3.18.2 Impacts

The description of potential concerns provided in the Draft Solar PEIS remains valid. During past project-related consultation, the Southern Paiutes and Western Shoshone have expressed concern over project impacts on a variety of resources. Potential impacts could occur on important resources such as food plants, medicinal plants, plants used in basketry, plants used in construction, large and small game animals, birds, and sources of clay, salt, and pigments (Stoffle and Dobyns 1983). The construction of utility-scale energy facilities within the proposed SEZ would result in the destruction of some plants important to Native Americans and the habitat of some traditionally important animals.

In addition to the impacts discussed in the Draft Solar PEIS, the ethnographic study conducted for the proposed Wah Wah Valley SEZ identified the following impacts:

- Tribal representatives believe that solar energy development within the proposed Wah Wah Valley SEZ will adversely affect water sources, culturally important geological features, and traditional plant, mineral, and animal resources (SWCA and University of Arizona 2011).

- Development within the proposed Wah Wah Valley SEZ may affect the spiritual connection both tribes have to water and magma, through *Puha*, especially for developments near spiritual water sources, such as Wah Wah Springs, and any prominent volcanic feature located within the SEZ.

- Development within the proposed Wah Wah Valley SEZ will directly affect culturally important plant and animal resources, because it will likely require the grading of the project area.

13.3.18.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on Native Americans 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 assume that the necessary surveys, evaluations, and consultations will occur. The tribes would be notified regarding the results of archaeology surveys, and they would be contacted immediately upon any discovery of Native American human remains and associated cultural items.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, the following SEZ-specific design feature to address Native American concerns has been identified:

- Compensatory programs of mitigation could be implemented to provide access to and/or deliberately cultivate patches of culturally significant plants, like the Indian ricegrass fields present within the Wah Wah Valley SEZ, on other public lands nearby where tribes have ready access.

The need for and nature of additional SEZ-specific design features regarding potential issues of concern 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 and landscapes in the vicinity of the SEZ associated with Wah Wah Springs, Sevier Lake, Lake Bonneville, Wah Wah Mountains, Wallaces Peak, and the Wasatch Mountains, as well as important water sources, ceremonial areas, and traditionally important plant and animal species, should be considered and discussed during consultation.

13.3.19 Socioeconomics

13.3.19.1 Affected Environment

The boundaries of the Wah Wah Valley SEZ have not changed. 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 the affected environment information given in the Draft Solar PEIS are required.

13.3.19.2 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 on local community service employment. Since the boundaries of the proposed Wah Wah Valley SEZ remain unchanged and the reduction of the developable area was small (less than 4%), the impacts of full build-out of the SEZ estimated in the Draft Solar PEIS remain essentially unchanged. During construction, between 213 and 2,817 jobs and between $11.2 million and $148 million in income could be associated with solar development in the SEZ. During operations at full build-out, between 14 and 316 jobs and between $0.4 million and $9.7 million in income could be produced. In-migration of workers and their families would mean between 48 and 631 rental housing units would be needed during construction, and between 4 and 81 owner-occupied units during operations.

13.3.19.3 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 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.

13.3.20 Environmental Justice

13.3.20.1 Affected Environment

The data presented in the Draft Solar PEIS have not changed substantially for the proposed Wah Wah Valley SEZ. There are no minority or low-income populations in the Nevada or Utah portions of the 50-mi (80-km) radius of the SEZ taken as a whole. At the individual block group level, there are low-income populations in specific census block groups located in two block groups in Iron County, in Cedar City itself, and to the west of Cedar City.

13.3.20.2 Impacts

Potential impacts (e.g., from noise and dust during construction and operations, visual impacts, cultural impacts, and effects on property values) 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. Impacts are likely to be small, and there are no minority populations defined by CEQ guidelines (CEQ 1997) (see Section 13.3.20.1 of the Draft Solar PEIS) within the 50-mi (80-km) radius around the boundary of the SEZ. This means that any adverse impacts of solar projects would not disproportionately affect minority populations. Because there are no low-income populations within the 50-mi (80-km) radius as a whole, there would be no impacts on low-income populations.

13.3.20.3 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 such impacts.

On the basis of impact analyses conducted for the Draft Solar PEIS, and consideration of comments received as applicable, no SEZ-specific design features for environmental justice 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.

13.3.21 Transportation

13.3.21.1 Affected Environment

The reduction in developable area of the proposed Wah Wah Valley SEZ of less than 4% does not change the information on affected environment provided in the Draft Solar PEIS.

13.3.21.2 Impacts

As stated in the Draft Solar PEIS, the primary transportation impacts are anticipated to be from commuting worker traffic. Single projects could involve up to 1,000 workers each day, with an additional 2,000 vehicle trips per day (maximum). The volume of traffic on State Route 21 and other regional corridors would be more than double the current values near the SEZ. Local road improvements would be necessary on any portion of State Route 21 that might be developed so as not to overwhelm the local access roads near any site access point(s). Depending on the locations of the worker population, roads connecting to State Route 21 may also require upgrades (e.g., State Route 130). Potential existing site access roads would require improvements, including asphalt pavement.

Solar development within the SEZ would affect public access along OHV routes that are designated open and available for public use. 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.

13.3.21.3 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, would 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 and consideration of comments received as applicable, no SEZ-specific design features to address transportation 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.

13.3.22 Cumulative Impacts

The analysis of potential impacts in the vicinity of the proposed Wah Wah Valley SEZ presented in the Draft Solar PEIS is still generally applicable for this Final Solar PEIS. The size of the developable area of the proposed SEZ has been reduced by less than 4%. The following sections include an update to the information presented in the Draft Solar PEIS regarding cumulative effects for the proposed Wah Wah Valley SEZ.

13.3.22.1 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 impacts may occur (e.g., air quality impacts may have a greater geographic extent than visual resources impacts). Most of the lands around the SEZ are state owned, administered by the USFS, or administered by the BLM. The BLM administers approximately 75% of the lands within a 50-mi (80-km) radius of the SEZ.

13.3.22.2 Overview of Ongoing and Reasonably Foreseeable Future Actions

The Draft Solar PEIS included two other proposed SEZs in Southwestern Utah, Escalante Valley and Milford Flats South; these areas remain proposed as SEZs.

13.3.22.2.1 Energy Production and Distribution

The list of reasonably foreseeable future actions related to energy production and distribution near the proposed Wah Wah Valley SEZ has been updated and is presented in Table 13.3.22.2-1. The locations of these projects are shown in Figure 13.3.22.2-1. All these projects were described in the Draft Solar PEIS.

13.3.22.2.2 Other Actions

Only two of the major ongoing and foreseeable actions within 50 mi (80 km) of the proposed Wah Wah Valley SEZ listed in Table 13.3.22.2-3 of the Draft Solar PEIS have had a change in their status: Utah's Copper King Mining has filed for Chapter 11 and suspended operations at the Hidden Treasure Mine (Oberbeck 2010), and the Environmental Assessment on the Hamlin Valley Resource Protection and Habitat Improvement Project was issued on February 2, 2012 (BLM 2012b).

13.3.22.3 General Trends

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

13.3.22.4 Cumulative Impacts on Resources

Total disturbance in the proposed Wah Wah Valley SEZ over 20 years is assumed to be up to about 4,698 acres (19.0 km^2) (80% of the entire 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 Wah Wah Valley SEZ may include impacts on water quantity and quality, air

TABLE 13.3.22.2-1 Ongoing and Reasonably Foreseeable Future Actions Related to Energy Development and Distribution near the Proposed Wah Wah Valley SEZ as Revised[a]

Description	Status	Resources Affected	Primary Impact Location
Renewable Energy Development			
Milford Wind (UTU 82972) **97 turbines, 204 MW[b]**	**Operating since November 2009[b]**	Land use, ecological resources, visual	About 25 mi[c] east-northeast of the Wah Wah Valley SEZ (Beaver and Millard Counties)
Milford Wind Phase II (UTU 83073) **68 turbines, 102 MW[b]**	**Operating since May 2011[b]**	Land use, ecological resources, visual	About 25 mi east-northeast of the Wah Wah Valley SEZ (Beaver and Millard Counties)
Milford Wind Phases III (UTU 8307301) **140 turbines, 16,068 acres[d] (private)**	**Draft Environmental Assessment Report October 2011[e]**	Land use, ecological resources, visual	About 25 mi east-northeast of the Wah Wah Valley SEZ (Beaver and Millard Counties)
Milford Wind Phases IV–V (UTU 8307301)	Planned	Land use, ecological resources, visual	About 25 mi east–northeast of the Wah Wah Valley SEZ (Beaver and Millard Counties)
Geothermal Energy Project UTU 66583O	Authorized	Land use, groundwater, terrestrial habitats, visual	About 30 mi east of the Wah Wah Valley SEZ (Beaver County)
Geothermal Energy Project UTU 66583X	Authorized	Land use, groundwater terrestrial habitats, visual	About 30 mi east of the Wah Wah Valley SEZ (Beaver County)
Blundell Geothermal Power Station **Units 1 & 2, 26 & 12 MW, 2,000 acres[f]**	Ongoing	Land use, groundwater, terrestrial habitats, visual	About 30 mi northeast of the Wah Wah Valley SEZ (Beaver County)
Transmission and Distribution System			
Sigurd to Red Butte No. 2, 345-kV Transmission Line Project	**DEIS May 2011[g]**	Land use, ecological resources, visual	About 17 mi east of the Wah Wah ValleySEZ
Energy Gateway South, 500-kV AC Transmission Line Project	**ROW modified and no longer within 50 mi (80 km) of the SEZ[h]**		

TABLE 13.3.22.2-1 (Cont.)

Description	Status	Resources Affected	Primary Impact Location
Transmission and Distribution System (Cont.)			
TransWest Express, 600-kV DC Transmission Line Project	**Scoping Report July 2011**[i]	Land use, ecological resources, visual	About 17 mi east of the Wah Wah ValleySEZ
UNEV Liquid Fuel Pipeline (UTU-79766)	**ROD July 1, 2010**[j]	Disturbed areas, terrestrial habitats along pipeline ROW	About 17 mi east of the Wah Wah Valley SEZ

[a] Projects with status changed or additional information from that given in the Draft Solar PEIS are shown in bold text.

[b] See First Wind (2011) for details.

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

[d] To convert acres to km^2, multiply by 0.04047.

[e] See CH2MHILL (2011) for details.

[f] See PacifiCorp (2011) for details.

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

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

[i] See BLM and Western (2011) for details.

[j] See BLM (2010) for details.

quality, ecological resources such as habitat and species, cultural and visual resources, and specially designated lands.

No additional major actions have been identified within 50 mi (80 km) of the SEZ. The incremental cumulative impacts associated with development in the proposed Wah Wah Valley SEZ during construction, operation, and decommissioning are expected to be the same as those projected in the Draft Solar PEIS.

13.3.23 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 Wah Wah Valley 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 13.3.2 through 13.3.22, this section is not an update of previous analysis for the Wah Wah Valley 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

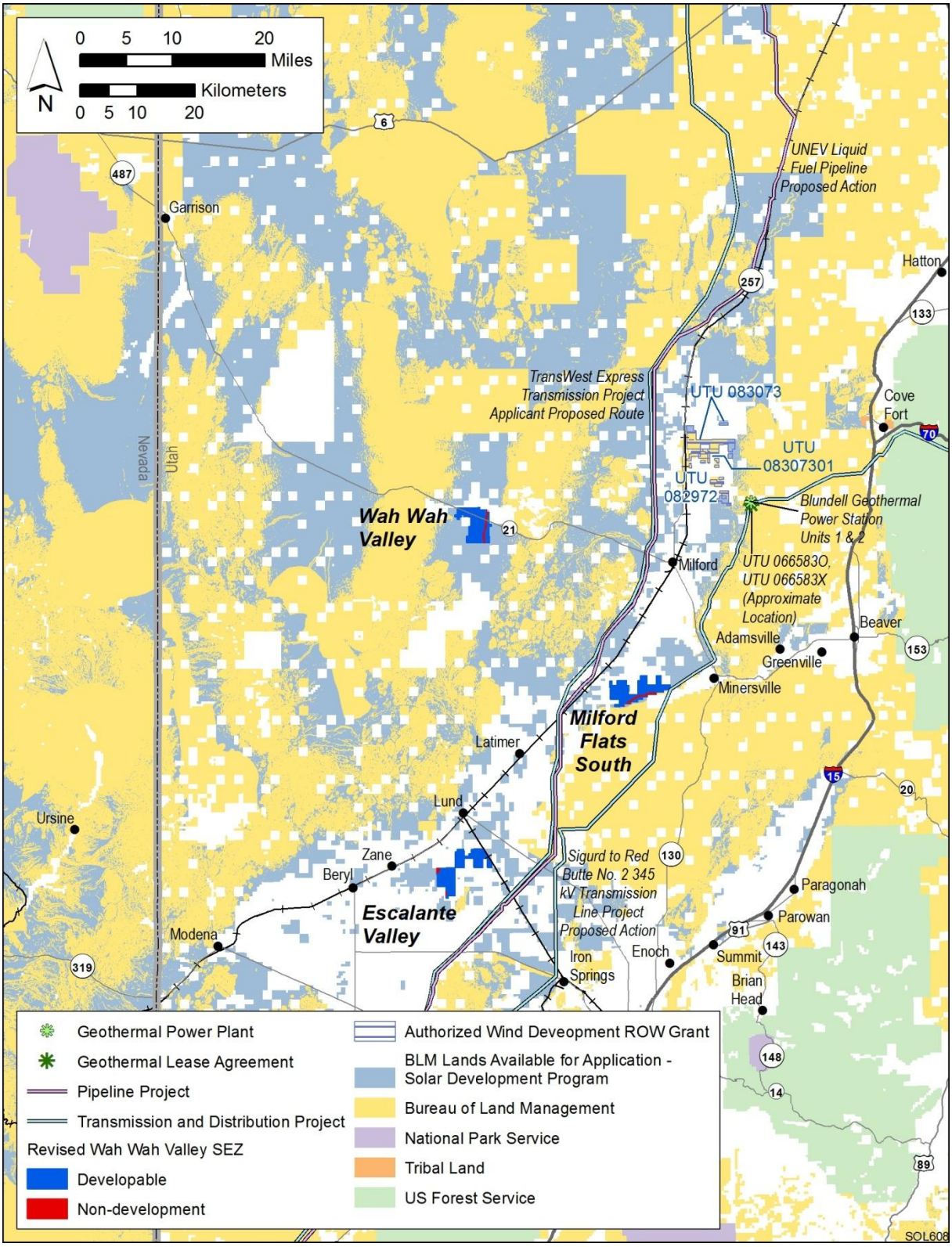

FIGURE 13.3.22.2-1 Locations of Existing and Reasonably Foreseeable Renewable Energy Projects on Public Land within a 50-mi (80-km) Radius of the Proposed Wah Wah Valley SEZ as Revised

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

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 Wah Wah Valley SEZ is estimated to have the potential to generate 940 MW of marketable solar power at full build-out.

13.3.23.1 Identification and Characterization of Load Areas

The primary candidates for Wah Wah Valley SEZ load areas are the major surrounding cities. Figure 13.3.23.1-1 shows the possible load areas for the Wah Wah Valley SEZ and the estimated portion of their market that could be served by solar generation. Possible load areas for the Wah Wah Valley SEZ include St. George and Salt Lake City, Utah; Las Vegas, Nevada; and the major cities in San Bernardino and Riverside Counties, California.

The two load area groups examined for the Wah Wah Valley SEZ are as follows:

1. Las Vegas, Nevada; and

2. Salt Lake City, Utah; and San Bernardino–Riverside County load II and San Bernardino–Riverside County load I, California.

Figure 13.3.23.1-2 shows the most economically viable load groups and transmission scheme for the Wah Wah Valley SEZ (transmission scheme 1), and Figure 13.3.23.1-3 shows an alternative transmission scheme (transmission scheme 2) that represents a logical choice should transmission scheme 1 be infeasible. As described in Appendix G, the alternative shown in transmission scheme 2 represents the optimum choice if one or more of the primary linkages in transmission scheme 1 are excluded from consideration. The groups provide for linking loads along alternative routes so that the SEZ's output of 940 MW could be fully allocated.

Table 13.3.23.1-1 summarizes and groups the load areas according to their associated transmission scheme and provides details on how the megawatt load for each area was estimated.

13.3.23.2 Findings for the DLT Analysis

The DLT analysis approach assumes that the Wah Wah Valley SEZ will require all new construction for transmission lines (i.e., dedicated lines) and substations. The new transmission lines(s) would directly convey the 940-MW output of the Wah Wah Valley SEZ to the prospective load areas for each possible 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.

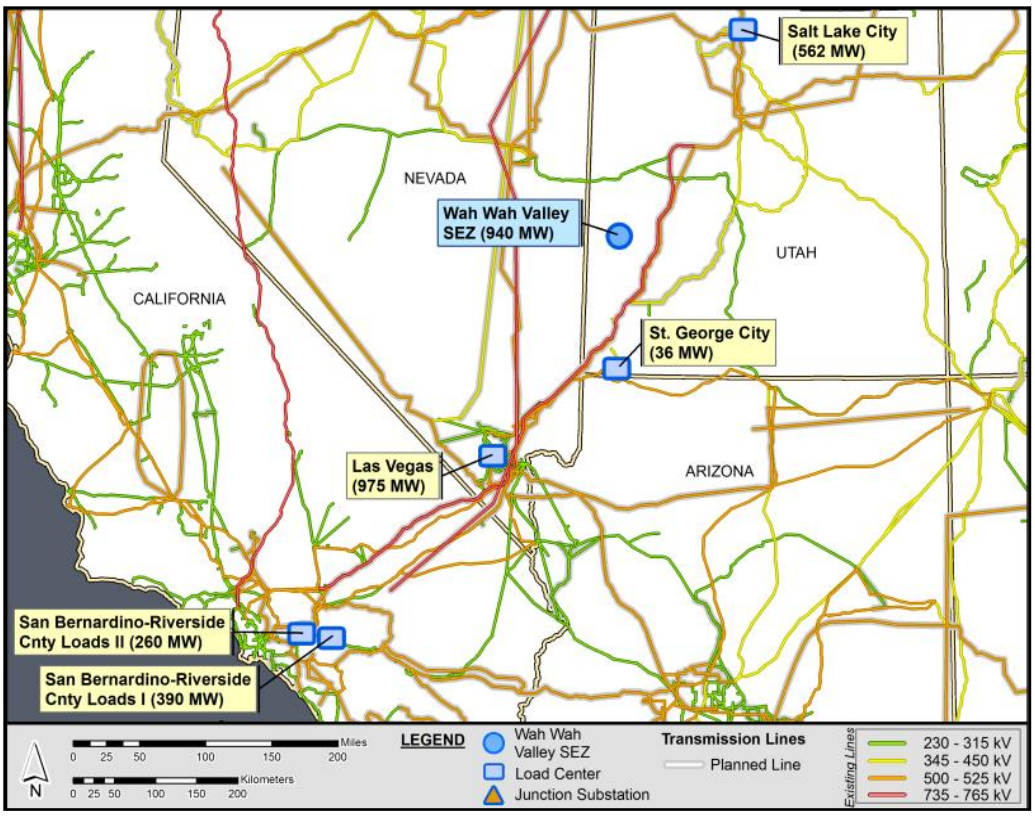

FIGURE 13.3.23.1-1 Location of the Proposed Wah Wah Valley SEZ and Possible Load Areas (Source for background map: Platts 2011)

Figures 13.3.23.1-2 and 13.3.23.1-3 display the pathways that new dedicated lines might follow to distribute solar power generated at the Wah Wah Valley SEZ via the two identified transmission schemes described in Table 13.3.23.1-1. These pathways parallel existing 500-, 345-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 transmission scheme 1, serving the southwest, a new line would be constructed to connect with Las Vegas, so that the 940-MW output of the Wah Wah Valley SEZ could be fully utilized (Figure 13.3.23.1-2). This particular scheme has three segments. The first segment extends to the southwest from the SEZ to the first switching station over a distance of about 29 mi (47 km). On the basis of engineering and operational considerations, this segment would require a double-circuit 345-kV (2–345 kV) bundle of two (Bof2) transmission line design. The second leg goes about 72 mi (116 km) from the first switching station to a second switching station, and the third and final segment extends about 125 mi (201 km) from the second switching station to Las Vegas. In general, the transmission configuration options were determined by using the line "loadability" curve provided 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.

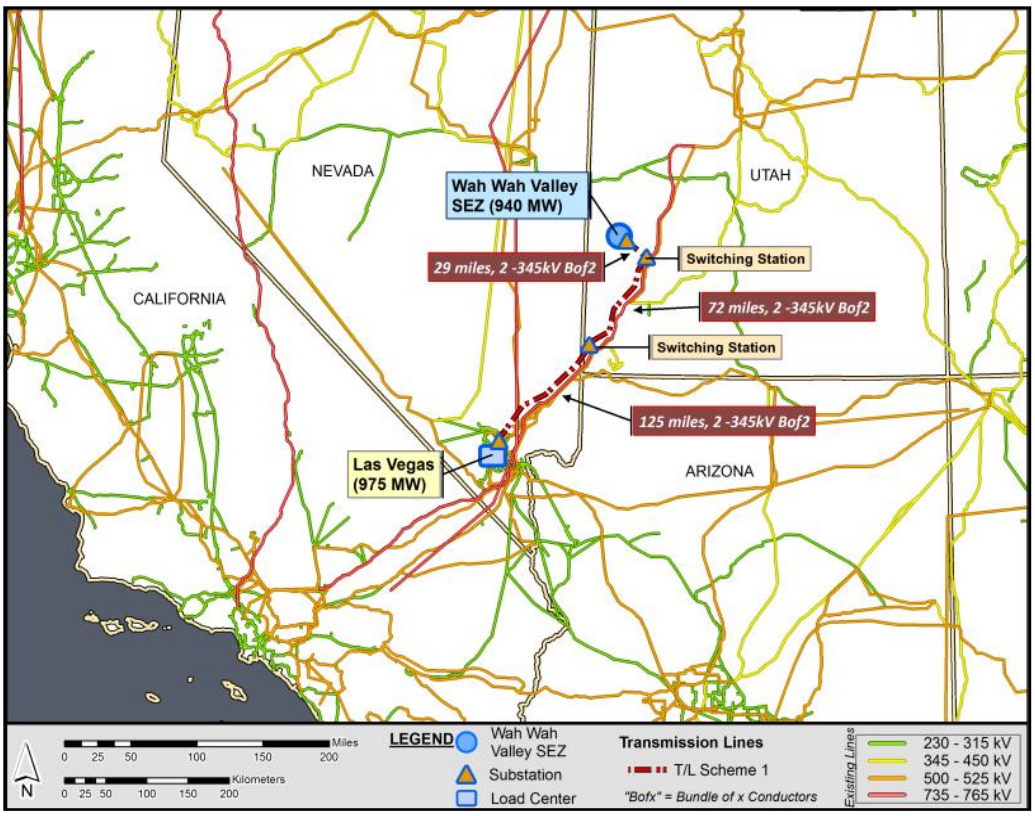

FIGURE 13.3.23.1-2 Transmission Scheme 1 for the Proposed Wah Wah Valley SEZ (Source for background map: Platts 2011)

Transmission scheme 2, which assumes the Las Vegas market is not available, serves load centers to the southwest and northwest. Figure 13.3.23.1-3 shows that new lines would be constructed to connect with Salt Lake City, San Bernardino–Riverside County load II (260 MW) and San Bernardino–Riverside County load I (562 MW), so that the 940-MW output of the Wah Wah Valley SEZ could be fully utilized. This scheme has six segments. The first segment extends to the southwest from the SEZ to the first switching station over a distance of about 29 mi (47 km). This segment would require a double-circuit 345-kV (2–345 kV) bundle of two (Bof2) transmission line design. The second leg goes about 72 mi (116 km) from the first switching station to the second switching station, and the third leg extends about 125 mi (201 km) from the second switching station to the Las Vegas switching station. The fourth segment runs from the Las Vegas switching station to the San Bernardino–Riverside County load II (260 MW) via a 237-mi (381-km) line, while the fifth leg links San Bernardino–Riverside County load II with San Bernardino–Riverside County load I (390 MW) via a 15-mi (24-km) line. The seventh leg extends to the northeast from the first switching station near the SEZ to Salt Lake City (562 MW) over a distance of 190 mi (306 km).

Table 13.3.23.2-1 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

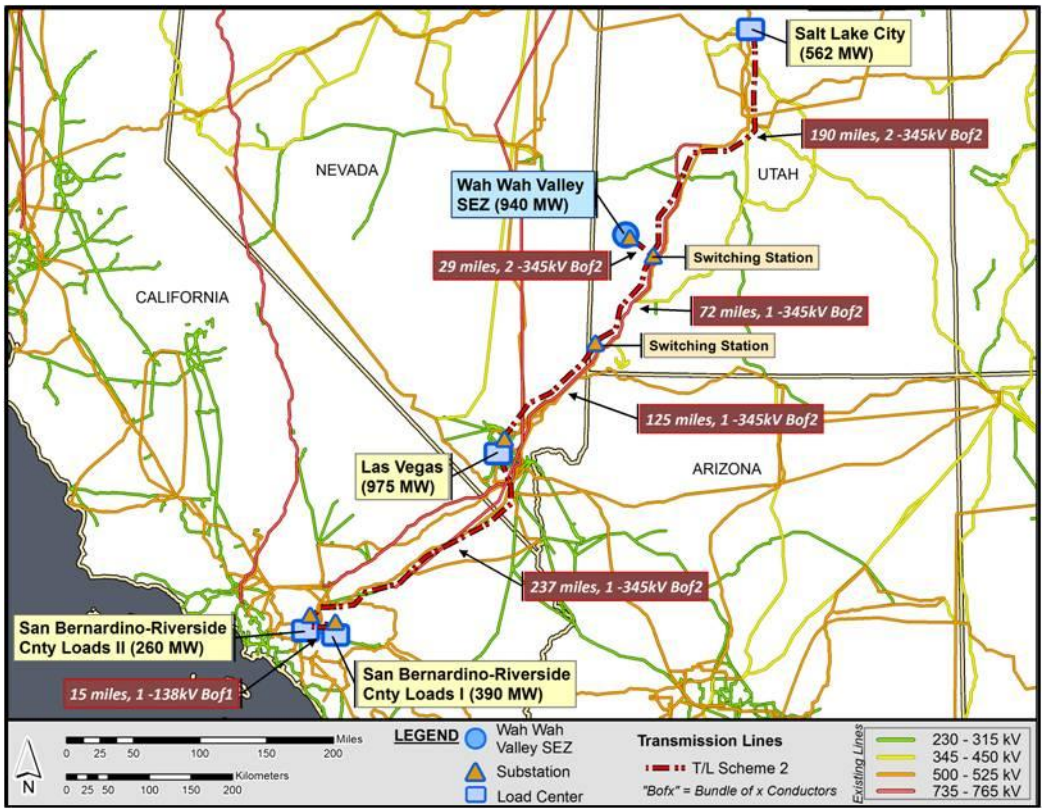

FIGURE 13.3.23.1-3 Transmission Scheme 2 for the Proposed Wah Wah Valley SEZ (Source for background map: Platts 2011)

TABLE 13.3.23.1-1 Candidate Load Area Characteristics for the Proposed Wah Wah Valley SEZ

Transmission Scheme	City/Load Area Name	Position Relative to SEZ	2010 Population[d]	Estimated Total Peak Load (MW)	Estimated Peak Solar Market (MW)
1	Las Vegas, Nevada[a]	South	1,950,000	4,878	975
2	San Bernardino–Riverside County load II, California[b]	Southwest	520,000	1,312	260
	San Bernardino–Riverside County load I, California[c]	South	780,000	1,967	390
	Salt Lake City, Utah[a]	Northeast	1,124,000	2,810	562

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

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

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

[d] City and metropolitan area population data are from 2010 Census data (U.S. Bureau of the Census 2010).

TABLE 13.3.23.2-1 Potential Transmission Schemes, Estimated Solar Markets, and Distances to Load Areas for the Proposed Wah Wah Valley SEZ

Transmission Scheme	City/Load Area Name	Estimated Peak Solar Market (MW)[d]	Total Solar Market (MW)	Sequential Distance (mi)[e]	Total Distance (mi)[e]	Line Voltage (kV)	No. of Substations
1	Las Vegas, Nevada[a]	975	975	226	226	345	4
2	San Bernardino–Riverside County load II, California[b]	260	1,212	463	668	345, 138	7
	San Bernardino–Riverside County load I, California[c]	390		15			
	Salt Lake City, Utah[a]	562		190			

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

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

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

[d] From Table 13.3.23.1-1.

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

additional one at the SEZ. 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 rating of at least 940 MW (to match the plant's output), while the combined load substations would have a similar total rating of 940 MW. Switching stations are introduced at appropriate junctions where there is the need to branch out to simultaneously serve two or more load areas in different locations.

Table 13.3.23.2-2 provides an estimate of the total land area disturbed for construction of new transmission facilities under each of the schemes evaluated. The most favorable transmission scheme with respect to minimizing costs and the area disturbed would be scheme 1, which serves Las Vegas. This scheme is estimated to potentially disturb about 4,862 acres (19.7 km^2) of land. The less favorable transmission scheme with respect to minimizing costs and the area disturbed would be scheme 2 (serving San Bernardino–Riverside County loads and Salt Lake City, but excluding Las Vegas). For this scheme, the construction of new transmission lines and substations is estimated to disturb a land area on the order of 14,060 acres (56.9 km^2).

Table 13.3.23.2-3 shows the estimated NPV of both transmission schemes 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.

TABLE 13.3.23.2-2 Comparison of the Various Transmission Line Configurations with Respect to Land Use Requirements for the Proposed Wah Wah Valley SEZ

Transmission Scheme	City/Load Area Name	Total Distance (mi)[d]	No. of Substations	Land Use (acres)[e]		
				Transmission Line	Substation	Total
1	Las Vegas, Nevada[a]	226	4	4,793.9	67.6	4,861.5
2	San Bernardino–Riverside County load II, California[b] San Bernardino–Riverside County load I, California[c] Salt Lake City, Utah[a]	668	7	13,997.0	63.2	14,060.2

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

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

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

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

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

TABLE 13.3.23.2-3 Comparison of Potential Transmission Lines with Respect to NPV (Base Case) for the Proposed Wah Wah Valley 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	Las Vegas, Nevada[a]	565.0	186.1	164.7	1,271.7	664.6
2	San Bernardino–Riverside County load II, California[b] San Bernardino–Riverside County load I, California[c] Salt Lake City, Utah[a]	1,511.5	207.5	164.7	1,271.7	−301.8

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

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

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

The most economically attractive configuration (transmission scheme 1) has the highest positive NPV and serves Las Vegas. The secondary case (transmission scheme 2), which excludes the Las Vegas market, is less economically attractive. For the assumed utilization factor of 20%, scheme 2 exhibits a negative NPV, implying that this option may not be economically viable under the current assumptions.

Table 13.3.23.2-4 shows the effect of varying the value of the utilization factor on the NPV of the transmission schemes. The table shows that at about 30% utilization, the NPVs for both transmission schemes are positive. 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 findings of the DLT analysis for the proposed Wah Wah Valley SEZ are as follows:

- Transmission scheme 1, which identifies Las Vegas as the primary market, represents the most favorable option based on NPV and land use requirements. This configuration would result in new land disturbance of about 4,862 acres (19.7 km^2).

- Transmission scheme 2, which represents an alternative configuration if Las Vegas is excluded, serves the major cities in San Bernardino and Riverside Counties and Salt Lake City. This configuration would result in new land disturbance of about 14,060 acres (56.9 km^2).

TABLE 13.3.23.2-4 Effect of Varying the Utilization Factor on the NPV of the Transmission Schemes for the Proposed Wah Wah Valley SEZ

Transmission Scheme	City/Load Area Name	NPV ($ million) at Different Utilization Factors					
		20%	30%	40%	50%	60%	70%
1	Las Vegas, Nevada[a]	644.6	1,280.5	1,916.3	2,552.2	3,188.0	3,823.8
2	San Bernardino–Riverside County load II, California[b] San Bernardino–Riverside County load I, California[c] Salt Lake City, Utah[a]	–301.8	334.0	969.8	1,605.7	2,241.5	2,877.4

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

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

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

- Other load area configurations are possible but would be less favorable than scheme 1 in terms of NPV and, in most cases, also in terms of land use requirements. If new electricity generation at the proposed Wah Wah Valley SEZ is not sent to either of the two markets identified above, the potential upper-bound impacts in terms of cost would be greater.

- The analysis of transmission requirements for the proposed Wah Wah Valley SEZ indicates no reduction of impacts from increasing the solar-eligible load assumption for transmission scheme 1, which brings power to St. George. Increasing the solar-eligible percentage would have no effect, because an adequate load area was identified under the 20% assumption that would accommodate all of the SEZ's capacity. Thus, line distances and voltages would not be affected by increasing the solar-eligible load assumption, and similarly the associated costs and land disturbance would not be affected. However, for transmission scheme 2, which serves the major cities in San Bernardino and Riverside Counties and Salt Lake City, increasing the assumed solar-eligible load assumption could result in lower cost and land disturbance estimates, because it is possible that fewer load areas would be needed to accommodate the SEZ's capacity.

13.3.24 Impacts of the Withdrawal

The BLM is proposing to withdraw 6,097 acres (25 km^2) of public land comprising the proposed Wah Wah Valley 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.

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 Wah Wah Valley SEZ, the impacts of the proposed withdrawal on mineral resources and related economic activity and employment are expected to be negligible because the mineral potential of the lands within the SEZ is low (BLM 2012a). There has been no documented mining with

the SEZ, and there are no known locatable mineral deposits within the land withdrawal area. According to the LR2000 (accessed in February 2012), there are no recorded mining claims within the land withdrawal area.

Although the mineral potential of the lands within the Wah Wah Valley SEZ is low, 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).

13.3.25 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 PEIS. 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 the 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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13.3.26 Errata for the Proposed Wah Wah Valley SEZ

This section presents corrections to material presented in the Draft Solar PEIS and the Supplement to the Draft. 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 13.3.26-1 provides corrections to information presented in the Draft Solar PEIS and the Supplement to the Draft.

TABLE 13.3.26-1 Errata for the Proposed Wah Wah Valley SEZ (Section 13.3 of the Draft Solar PEIS and Section C.6.3 of the Supplement to the Draft Solar PEIS)

Section No.	Page No.	Line No.	Figure No.	Table No.	Correction
13.3.11.2					All uses of the term "neotropical migrants" in the text and tables of this section should be replaced with the term "passerines."

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