

RECOMMENDED ADDITIONAL DATA COLLECTION RIVERSIDE EAST SOLAR ENERGY ZONE

Introduction

The Solar PEIS provides in-depth data collection and environmental analysis for solar energy zones (SEZs). The primary purpose of this rigorous analysis is to provide documentation from which the BLM can tier future project authorizations, thereby limiting the required scope and effort of project-specific NEPA analyses in these priority areas. As part of the Solar Energy Program, the BLM committed to collecting additional SEZ-specific data and conducting additional analysis in order to more effectively facilitate future development in SEZs. In the Supplement to the Draft Solar PEIS (BLM and DOE 2011), the BLM presented an action plan for each SEZ; that action plan, with appropriate updates, was used as the basis for recommended additional data collection for the Riverside East SEZ presented below. Action plans described useful additional data for individual SEZs and proposed data sources and methods for collecting that additional data. Additional data and analyses for SEZs will be publicly released through the Solar Energy Program Implementation Web Site (<http://blmsolar.anl.gov>) as they become available.

The Riverside East SEZ has a total area of 147,910 acres (598.6 km²). It is located Riverside County in southeastern California. The small town of Desert Center is located at the far southwestern edge of the SEZ, along Interstate 10 (I-10). The towns of Blythe and Indio are about 6 mi (10 km) southeast of and 45 mi (72 km) west of the SEZ, respectively.

Recommended Additional Data Collection for the Riverside East SEZ

Military and Civilian Aviation

The BLM should continue to consult with the U.S. Department of Defense regarding potential issues with military training routes. The potential impact of power towers in this SEZ, including the ability of power towers to comply with Federal Aviation Administration regulations pertaining to air navigation obstructions, should be further investigated.

Minerals

Additional information to inform the Department of the Interior's decision on a proposed 20-year withdrawal of SEZ lands has been provided through six Mineral Reports addressing each SEZ (one report for each state in the study area). The Mineral Report for California addresses the status of Minerals within the Riverside East SEZ (BLM 2012).

Water Resources

The Final Solar PEIS provided a planning-level water resources inventory of the Chuckwalla and Palo Verde Mesa basins, an assessment of ephemeral stream reaches sensitive to land disturbance, and a simplified one-dimensional groundwater modeling analysis of potential

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groundwater withdrawal impacts associated with solar development. The following additional data and actions would help further characterize potential impacts on water resources for the Riverside East SEZ. A more detailed discussion of each of these activities is included in the water resources action plan for the SEZs (Attachment A).

- Identify additional ephemeral stream channels and alluvial fan features for non-development areas through consultation with the California Department of Fish and Game (CDFG), California BLM, U.S. Environmental Protection Agency, and U.S. Army Corps of Engineers (USACE) with a focus on (moving west to east):
 - Alluvial fans and sand dune features surrounding Palen Lake and western face of Coxcomb Mountains,
 - Alluvial fan features on south face of Palen Mountains,
 - Alluvial fan features on western and southern faces of McCoy Mountains,
 - Alluvial fan features on western, northern, and eastern faces of Mule Mountains,
 - Ephemeral headwater channels of McCoy Wash,
 - Alluvial fan features on eastern face of McCoy Mountains,
 - Alluvial fan features on southern and eastern faces of Little Maria Mountains, and
 - Alluvial fan features on western face of Big Maria Mountains.
- Perform field surveys and hydrologic analyses to support jurisdictional water determinations and floodplain identifications. Tasks include:
 - Surveying select stream channels and alluvial fan features for elevations, high water marks, and sediment conditions, and
 - Conducting hydrologic rainfall-runoff-routing analyses to identify 100-year floodplain areas.
- Coordinate with the USACE (Los Angeles District) regarding jurisdictional water determinations. Water features to be considered include:
 - McCoy Wash and its tributaries.
- Identify 100-year floodplain exclusion areas for the SEZ. This task would require coordination with the California Department of Water Resources (Division of Flood Management), the Riverside County Flood Control and Water Conservation District, and the Southern California Alluvial Fan Task Force.
- Monitoring and adaptive management for the SEZ should include the formation of a stakeholder committee to conduct long-term monitoring of water resources. This activity would entail:
 - Identifying key stakeholder agencies;
 - Discussing general features of a monitoring program;

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- Providing recommendations of surface monitoring of ephemeral stream networks through consultations with CDFG, California BLM, EPA, and USACE; and
 - Working with the U.S. Geological Survey to develop groundwater monitoring well design and numerical groundwater models.
- A three-dimension model that is based on the Leake et al. (2008) superposition groundwater model should be developed in order to estimate potential impacts of full-build-out groundwater pumping scenarios (according to estimated, technology-specific water requirements) to include:
 - Assessing the potential for drawdown impacts on the Colorado River Accounting Surface;
 - Coordinating with the U.S. Bureau of Reclamation (managing agency of Colorado River Act) regarding results and implications;
 - Assessing the potential for drawdown impacts on Palen Lake (wet playa) and other surface water features identified in planning level inventory; and
 - Assessing the potential for drawdown impacts on other groundwater users of the Chuckwalla and Palo Verde Mesa basins.(Note: This work is being conducted as a part of follow-on analyses for the Solar PEIS.)

Ecological Resources

Vegetation and Plant Communities. The following additional data-gathering actions would help further characterize potential impacts on vegetation and plant communities for the Riverside East SEZ:

- Identify and map the location and areal extent of desert dry washes, dry wash woodland/microphyll woodland (including ironwood forest), riparian (including mesquite bosque), desert chenopod scrub, and wetland habitats within the SEZ. Identify and map the location and areal extent of these habitats, as well as bush seep-weed (*Suaeda moquinii*) communities, outside the SEZ that could be affected by hydrologic changes, including groundwater elevations, and changes in water, sediment, and contaminant inputs associated with runoff. Such efforts could determine habitat characteristics, including water source, hydrologic regime, and dominant plant species.
- Identify and map the location and areal extent of sand dunes and sand transport systems within the SEZ.
- Identify and map the location of cactus, including barrel cactus and cholla, and Yucca species, within the SEZ.

Wildlife. The following additional data-gathering actions would help further characterize potential impacts on wildlife resources for the SEZ:

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- Conduct pre-disturbance surveys within the SEZ to determine the use of the SEZ as a movement/migratory corridor or as important habitat for mule deer.
- Identify and map the location and areal extent of wash and playa habitats within the SEZ . These areas are important habitat for a number of wildlife species.

Aquatic Biota. Investigations recommended under the water resources action plan would be useful in characterizing and protecting habitat available to aquatic biota. No surveys are necessary for surface water features that have been identified as non-development areas (e.g., McCoy Wash). However, if it is determined that the surface water features in the non-development areas could be affected indirectly by water withdrawals, changes in drainage patterns, and construction activities, the potential for aquatic communities in these areas to be affected could require further investigation prior to development. Other surface water features within the SEZ not identified as non-development zones may contain aquatic biota; therefore, preliminary evaluations of these surface water features could be conducted to determine the potential for aquatic communities to be present.

Special Status Species. The following additional data-gathering actions would be useful in further characterizing and protecting habitat available to special status species:

- Conduct pre-disturbance surveys within the SEZ to determine the presence and abundance of those special status species that are federally listed, proposed for listing, or candidates for listing under the Endangered Species Act; (2) listed by the State of California as endangered, threatened, or fully protected; or (3) designated as sensitive by the California BLM State Office. These species are listed in Table 1. Surveys should focus on areas identified as potentially suitable and the suitability of these habitats to support these special status species should be determined in the field. All field-determined suitable habitats for special status species should be mapped. Target species and survey protocols should be developed in coordination with the U.S. Fish and Wildlife Service (USFWS) and CDFG.
- The Draft Solar PEIS presents a table of special status species for which potential impacts need to be evaluated prior to development in the Riverside East SEZ. The list of species presented in Table 9.4.12.1-1 of the Draft Solar PEIS also includes species listed by the State of California and species ranked by the States of California or Arizona as S1 or S2, or species of concern by the State of California. No additional special status species were identified as potentially present in the SEZ in the Final Solar PEIS. On the basis of the design features presented in the Final Solar PEIS, the potential for impacts on these additional species will also need to be addressed before development could occur in the SEZ.

TABLE 1 Special Status Species That May Occur on the Riverside East SEZ^a

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
<i>Plants</i>			
Alkali mariposa-lily	<i>Calochortus striatus</i>	BLM-S	Alkaline seeps, springs, and meadows at elevations between 2,600 and 4,600 ft. ^d Nearest recorded occurrences are 40 mi ^e west of the SEZ. About 68,658 acres ^f of potentially suitable habitat occurs within the SEZ region.
Chaparral sand-verbena	<i>Abronia villosa</i> var. <i>aurita</i>	BLM-S	Endemic to southern California. Inhabits chaparral desert sand dunes at elevations between 350 and 5,250 ft. Historically occurred on and in the vicinity of the SEZ; the species has not been recorded in the project area since 1964. Most recent recorded occurrences are 23 mi from the SEZ. About 84,357 acres of potentially suitable habitat occurs within the SEZ region.
Creamy blazing star	<i>Mentzelia tridentata</i>	BLM-S	Mojave desert creosotebush scrub communities on rocky and sandy substrates at elevations below 3,900 ft. Nearest recorded occurrences are 45 mi west of the SEZ. About 2,215,155 acres of potentially suitable habitat occurs within the SEZ region.
Giant spanish-needle	<i>Palafoxia arida</i> var. <i>gigantea</i>	BLM-S	Desert sand dune habitats at elevations below 330 ft. Nearest recorded occurrences are 40 mi south of the SEZ. Suitable habitat may exist on the site. About 84,168 acres of potentially suitable habitat occurs within the SEZ region.
Harwood's eriastrum	<i>Eriastrum harwoodii</i>	BLM-S	Known from fewer than 20 occurrences in southern California on desert dunes and other sandy habitats at elevations between 650 and 3,000 ft. Nearest recorded occurrence is 15 mi northwest of the SEZ in the Pinto Mountains DWMA (Desert Wildlife Management Area). About 84,168 acres of potentially suitable habitat occurs within the SEZ region.
Latimer's woodland-gilia	<i>Saltugilia latimeri</i>	BLM-S	Mojave Desert scrub communities, pinyon-juniper woodlands, and washes on rocky or sandy substrates at elevations between 1,300 and 6,500 ft. Nearest recorded occurrence is 30 mi west of the SEZ. About 2,920,277 acres of potentially suitable habitat occurs within the SEZ region.

TABLE 1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Plants (Cont.)			
Little San Bernardino Mountains linanthus	<i>Linanthus maculatus</i>	BLM-S	Known from fewer than 20 occurrences in southern California near Joshua Tree NP in desert dunes and sandy flats with creosotebush scrub and Joshua tree woodland communities at elevations less than 6,900 ft. Nearest recorded occurrences are 30 mi west of the SEZ. About 84,168 acres of potentially suitable habitat occurs within the SEZ region.
Munz's cholla	<i>Opuntia munzii</i>	BLM-S	Gravelly or sandy to rocky soils, often on lower bajadas, washes, flats, hills and canyon sides in Sonoran Desert creosotebush shrub communities at elevations below 3,280 ft. Nearest recorded occurrences are from the Chuckwalla DWMA, approximately 20 mi south of the SEZ. About 4,187,934 acres of potentially suitable habitat occurs within the SEZ region.
Orocopia sage^g	<i>Salvia greatae</i>	BLM-S	Creosotebush scrub communities and dry washes at elevations less than 2,600 ft. Known to occur in the affected area. Nearest occurrences are from the Chuckwalla DWMA about 2 mi south of the SEZ. About 2,853,196 acres of potentially suitable habitat occurs within the SEZ region.
White-margined beardtongue	<i>Penstemon albomarginatus</i>	BLM-S	Desert sand dune habitats and Mojave Desert scrub communities at elevations below 3,600 ft. Nearest recorded occurrences are 50 mi north of the SEZ. About 2,366,404 acres of potentially suitable habitat occurs within the SEZ region.
Reptiles			
Desert tortoise	<i>Gopherus agassizii</i>	ESA-T; CA-T	Mojave and Sonoran Deserts in desert creosotebush communities on firm soils for digging burrows, along riverbanks, washes, canyon bottoms, creosote flats, and desert oases. Known to occur on the SEZ (western and northeastern portions) and in the affected area. About 4,205,025 acres of potentially suitable habitat occurs within the SEZ region.

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TABLE 1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Reptiles (Cont.)			
Mojave fringe-toed lizard	<i>Uma scoparia</i>	BLM-S	Sandy habitats in the Mojave Desert from Death Valley south to the Colorado River near Blythe, California and extreme western Arizona. Sparsely-vegetated desert areas with fine windblown sand, including dunes, flats, and washes at elevations below 3,000 ft. Nearest recorded occurrences are 25 mi north of the SEZ. About 1,840,628 acres of potentially suitable habitat occurs within the SEZ region.
Rosy boa	<i>Charina trivirgata</i>	BLM-S	Southeastern California and western Arizona in scrublands, rocky deserts, and canyons with permanent or intermittent streams. Nearest recorded occurrences are from Joshua Tree NP, approximately 25 mi west of the SEZ. About 4,171,153 acres of potentially suitable habitat occurs within the SEZ region.
Birds			
Bendire's thrasher	<i>Toxostoma bendirei</i>	BLM-S	Summer resident in the SEZ region in a variety of desert habitats with fairly large shrubs or cacti and open ground, or open woodland with scattered shrubs and trees, between 0 and 1,180 ft elevation. Nearest recorded occurrence is 2 mi south of the SEZ in the Chuckwalla DWMA. About 2,526,161 acres of potentially suitable habitat occurs within the SEZ region.
Ferruginous hawk	<i>Buteo regalis</i>	BLM-S	Winter resident and migrant in the SEZ region at lower elevations in open grasslands, shrublands, sagebrush flats, desert scrub, desert valleys, and fringes of pinyon-juniper habitats. Occurs in Riverside County, California in the SEZ region. About 1,978,858 acres of potentially suitable habitat occurs within the SEZ region.
Gila woodpecker	<i>Melanerpes uropygialis</i>	CA-E	Year-round resident in the SEZ region along the Colorado River in desert riparian and desert wash habitats, orchards, vineyards, and urban habitats. Nearest recorded occurrence is from the Colorado River, approximately 6 mi east of the SEZ. About 297,582 acres of potentially suitable habitat occurs within the SEZ region.

TABLE 1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
<i>Birds (Cont.)</i>			
Golden eagle	<i>Aquila chrysaetos</i>	BLM-S CA-FP	An uncommon to common permanent resident and migrant in southern California. Habitat includes rolling foothills, mountain areas, and desert shrublands. Nests on cliff faces and in large trees in open areas. About 3,104,000 acres of potentially suitable habitat occurs within the SEZ region.
Western burrowing owl	<i>Athene cunicularia hypugaea</i>	BLM-S	Year-round resident in the SEZ region. Open areas with short, sparse vegetation, including grasslands, agricultural fields, and disturbed areas. Nests in burrows created by mammals or tortoises. Known to occur in the affected area. Nearest occurrences are within 1 mi east of the SEZ. About 4,653,092 acres of potentially suitable habitat occurs within the SEZ region.
<i>Mammals</i>			
California leaf-nosed bat	<i>Macrotus californicus</i>	BLM-S	Year-round resident in SEZ region in desert riparian, desert wash, desert scrub, and palm oasis habitats at elevations below 2,000 ft. Roosts in mines, caves, and buildings. Known to occur in the affected area. Nearest recorded occurrences are from the Palen/McCoy Wilderness within 2 mi of the SEZ. About 3,973,317 acres of potentially suitable habitat occurs within the SEZ region.
Cave myotis	<i>Myotis velifer</i>	BLM-S	Year-round resident in SEZ region in desert scrub, shrublands, washes, and riparian habitats. Roosts in colonies in caves. Known to occur in the affected area. Nearest recorded occurrence is from the Mule Mountains ACEC about 2 mi south of the SEZ. About 4,136,719 acres of potentially suitable habitat occurs within the SEZ region.
Nelson’s bighorn sheep	<i>Ovis canadensis nelsoni</i>	BLM-S	Open, steep rocky terrain in mountainous habitats of the eastern Mojave and Sonoran Deserts in California. Rarely uses desert lowlands, except as corridors for travel between mountain ranges. Known to occur in the affected area. Nearest recorded occurrences are from Joshua Tree Wilderness and the Chuckwalla DWMA, about 2 mi north, west, and south of the SEZ. About 1,896,141 acres of potentially suitable habitat occurs within the SEZ region.

TABLE 1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
<i>Mammals (Cont.)</i>			
Pallid bat	<i>Antrozous pallidus</i>	BLM-S	Year-round resident in SEZ region in low-elevation desert communities, including grasslands, shrublands, and woodlands. Roosts in caves, crevices, and mines. Known to occur in the affected area. Nearest recorded occurrence is from the Chuckwalla Mountains Wilderness approximately 5 mi south of the SEZ. About 3,668,119 acres of potentially suitable habitat occurs within the SEZ region.
Palm Springs pocket mouse	<i>Perognathus longimembris bangsi</i>	BLM-S	Creosote scrub, desert scrub, and grasslands on loose or sandy soils. Nearest recorded occurrence is from the Chuckwalla DWMA, approximately 25 mi west of the SEZ. About 3,749,649 acres of potentially suitable habitat occurs within the SEZ region.
Spotted bat	<i>Euderma maculatum</i>	BLM-S	Year-round resident in SEZ region in deserts, grasslands, and mixed coniferous forests at elevations below 10,000 ft. Roosts in caves, rock crevices, and buildings. Nearest recorded occurrence is 40 mi west of the SEZ. Suitable habitat exists on the site. About 2,363,936 acres of potentially suitable habitat occurs within the SEZ region.
Townsend’s big-eared bat	<i>Corynorhinus townsendii</i>	BLM-S	Year-round resident in SEZ region in all habitats but subalpine and alpine habitats, and at any season. Roosts in caves, mines, tunnels, buildings, or other man-made structures. Known to occur in the affected area. Nearest recorded occurrences are approximately 4 mi southeast of the SEZ. About 5,065,765 acres of potentially suitable habitat occurs within the SEZ region.
Western mastiff bat	<i>Eumops perotis californicus</i>	BLM-S	Year-round resident in SEZ region in open semiarid habitats, including conifer and deciduous woodlands, shrublands, grasslands, chaparral, and urban areas. Roosts in crevices in cliff faces, buildings, and tall trees. Known to occur in the affected area. Nearest recorded occurrence is 5 mi south of the SEZ. About 4,069,881 acres of potentially suitable habitat occurs within the SEZ region.

TABLE 1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
<i>Mammals (Cont.)</i>			
Western small-footed myotis	<i>Myotis ciliolabrum</i>	BLM-S	Year-round resident in SEZ region in woodland and riparian habitats at elevations below 9,000 ft. Roosts in caves, buildings, mines, and crevices of cliff faces. Nearest recorded occurrence is from the Chocolate Mountains, approximately 30 mi south of the SEZ. About 661,873 acres of potentially suitable habitat occurs within the SEZ region.
Western yellow bat	<i>Lasiurus xanthinus</i>	BLM-S	Year-round resident in SEZ region in desert riparian, desert wash, and palm oasis habitats at elevations below 2,000 ft. Roosts in trees. Nearest recorded occurrence is from Blythe, California, approximately 6 mi east of the SEZ. About 1,340,978 acres of potentially suitable habitat occurs within the SEZ region.

^a The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) California BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

^b BLM-S = listed as a sensitive species by the BLM; CA-E = listed as endangered by the State of California; CA-T = listed as threatened by the State of California; ESA-T = listed as threatened under the ESA..

^c For plant and invertebrate species, potentially suitable habitat was determined using California Regional Gap Analysis Project (CAREGAP) and Southwest Regional Gap Analysis Project (SWReGAP) land cover types (USGS 2005, 2010). For reptile, bird, and mammal species, potentially suitable habitat was determined using CAREGAP and SWReGAP habitat suitability models as well as CAREGAP and SWReGAP land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, defined as the area within 50 mi (80 km) of the SEZ center.

^d To convert ft to m, multiply by 0.3048.

^e To convert mi to km, multiply by 1.609.

^f To convert acres to km², multiply by 0.004047.

^g Species in bold text have been recorded or have designated critical habitat in the affected area.

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- Identify and map the location and areal extent of desert playa and wash habitats within the SEZ, including habitat characteristics (such as water source, hydrologic regime, and dominant plant species) both within the habitat boundaries and in adjacent habitats. Species potentially associated with these habitats include alkali mariposa-lily, California saw-grass, Coves' cassia, Emory's crucifixion-thorn, jackass-clover, Salt Spring checkerbloom, sand evening-primrose, Roberts' rhopalolemma bee, and crissal thrasher.
- Identify and map the location and areal extent of sand dunes and sand transport systems on the SEZ. Species potentially associated with these habitats include chaparral sand-verbena, dwarf germander, giant Spanish-needle, Harwood's eriastrum, jackass-clover, Little San Bernardino Mountains linanthus, and Mojave fringe-toed lizard.
- Identify and map the location and areal extent of woodland habitats on the SEZ should be determined and mapped. Species potentially associated with these habitats include loggerhead shrike, Lucy's warbler, Arizona myotis, and western yellow bat.
- Identify and map the location and areal extent of rocky cliff and outcrop habitats on the SEZ. Species potentially associated with these habitats include California leaf-nosed bat (roosting), cave myotis (roosting), Nelson's bighorn sheep, pallid bat (roosting), pocketed free-tailed bat (roosting), spotted bat (roosting), Townsend's big-eared bat (roosting), western mastiff bat (roosting), and western small-footed myotis (roosting).

Visual Resources

A summary of the Final Solar PEIS visual contrast analysis for the Riverside East SEZ is provided in Table 2. This table includes only the sensitive visual resource areas (SVRAs) and sensitive viewing locations (SVLs) that would be subject to moderate or strong visual contrast from solar energy development in the Riverside East SEZ, which are the following:

- California Desert Conservation Area
- Joshua Tree National Park (NP)
- Big Maria Mountains Wilderness Area (WA)
- Chuckwalla Mountains WA
- Joshua Tree WA
- Little Chuckwalla Mountains WA

TABLE 2 Selected Potentially Affected Sensitive Visual Resources within a 25-mi(40-km) Viewshed of Riverside East SEZ^a

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

TABLE 2 (Cont.)

Feature Type	Feature Name (Total Acreage/ Linear Distance) ^{a,b,c}	Feature Area or Linear Distance ^d		
		Visible within 5 mi	Visible Between	
			5 and 15 mi	15 and 25 mi
ACECs Designated for Outstanding Scenic Values	Corn Springs (2,463 acres)	332 acres (13%)	747 acres (30%)	0 acres

^a As revised for the Final Solar PEIS, assuming a target height of 650 ft (198.1 m).

^b To convert acres to km², multiply by 0.004047.

^c To convert mi to km, multiply by 1.609.

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

^e Percentage of total feature acreage or road length viewable.

^f Source: BLM (2012b).

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- Palen-McCoy WA
- Palo Verde Mountains WA
- Rice Valley WA
- Corn Springs Area of Critical Environmental Concern (ACEC)
- Bradshaw Trail Scenic Highway
- Colorado River Corridor Special Recreation Management Area (SRMA)

In addition, the following other lands and resource areas would be subject to moderate or strong visual contrasts from solar development:

- I-10
- State Route 177
- Communities of Blythe, East Blythe, Ehrenberg, Palo Verde, Ripley, and Desert Center.

The following steps could be taken to better understand potential impacts on these areas from solar development in the Riverside East SEZ:

- Identify key observation points (KOPs) within these areas through working with the management agency or other local stakeholders.
- Conduct viewshed analyses from the KOPs to determine how much of the SEZ would be in view from each KOP.
- As deemed necessary, based on viewshed analysis results, prepare wireframe Google Earth™ visualizations of hypothetical solar facilities in the SEZ depicting the 80% development scenario to better estimate potential impacts.

This additional analysis may help judge potential visual contrast more accurately for most KOPs. For KOPs of particularly high sensitivity, a site visit with photography and superimposition of the wireframe models onto the photos might be required or desired.

Paleontological Resources

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

vicinity of the SEZ. A more detailed look at the geological deposits of the SEZ is needed to determine whether a paleontological survey is warranted.

Cultural Resources and Native American Concerns

A Class I literature review was completed by SWCA Environmental Consultants (SWCA and University of Arizona 2011) for the original footprint of the Riverside East SEZ and a summary of the results were included in the Final Solar PEIS. The results of the records search did not reflect the results from the Palen, Blythe, Genesis, and Desert Sunlight Solar Power Projects, or any other recent investigations.

A Class II stratified random sample survey was conducted by SWCA Environmental Consultants (SWCA 2013) on 5,948 acres, or approximately 5% of the SEZ. A summary of the results of the survey are available on the Riverside East SEZ page of the BLM Solar Energy Program Implementation Web site (<http://blmsolar.anl.gov/sez/ca/riverside-east/>). A cultural sensitivity map was also prepared as part of the sample survey effort and is presented with the survey summary.

The following additional data collection efforts could reduce the uncertainty about potential impacts on cultural resources:

- Recordation of trail segments in full to assist in better understanding of cultural landscapes.
- NRHP evaluation of all newly recorded resources, as well as for previously recorded resources that have not yet been evaluated.
- Continue government-to-government consultation, including follow-up to recent ethnographic studies with Tribes not included in the original studies in Utah and Nevada to determine whether those Tribes have similar concerns or whether they would want to participate in a similar ethnographic study. The Riverside East SEZ falls in the traditional use area of the Serrano, Cahuilla, Quechan, Mohave, and Chemehuevi. Potential topics presented in the Draft Solar PEIS to be discussed during consultation include the proposed Prehistoric Trail Network Cultural Landscape/Historic District, which includes the Salt Song Trail, the *Xam Kwatcan* Trail, and the Cocomaricopa Trail; effects of workers and increased traffic on sacred sites; the loss of culturally important plants; the use and availability of water and the contamination of groundwater; ecological segmentation; important natural landscape features, such as the Big Marias, Coxcomb Mountains, Eagle Mountain, Alligator Rock, Black Rock, Palen Dry Lake, Ford Dry Lake, McCoy Springs, Corn Springs; local shrines and sacred sites; and several nearby ACECs and NRHP-listed properties, such as the Blythe Intaglios. Additional topics may also be relevant if identified during project-specific consultations for Desert Sunlight, Genesis, Blythe, and Palen solar projects.

References

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ATTACHMENT A: WATER RESOURCES ACTION PLAN

As part of the Solar Energy Program, the BLM committed to collecting additional SEZ-specific data and conducting additional analysis in order to more effectively facilitate future development in SEZs. In the Supplement to the Draft Solar PEIS (BLM and DOE 2011), the BLM presented a water resources action plan applicable for each SEZ; that action plan is presented below with appropriate updates. Additional data and analyses obtained on the basis of recommendations in this water resources action plan will be publicly released through the Solar Energy Program Implementation Web Site (<http://blmsolar.anl.gov>) as they become available.

The main action plan items relating to water resources applicable for all SEZs were discussed in the water resources action plan presented in the Supplement to the Draft Solar PEIS. The following sections explain each action plan item, identify items that were completed as part of the Final Solar PEIS, and provide some additional consideration for consultation with other federal, state, and local agencies and feasible timelines for the additional work.

1 Planning-Level Inventory of Water Resources

The Draft Solar PEIS summarized surface water and groundwater resources for individual SEZs at the programmatic level, but a more in depth or planning-level inventory was needed to provide a common resource for developers of individual SEZs. The following planning-level inventory data was provided in the Final Solar PEIS for all of the SEZs (sources in parentheses):

- Maps of basin valley and surrounding mountain ranges
 - All canals and perennial, intermittent, ephemeral streams (U.S. Geological Survey [USGS] National Hydrography Dataset [NHD])
 - HUC8 (8-digit, 4th-level hydrologic unit code) watersheds (USGS NHD)
 - Groundwater wells (USGS National Water Information System [NWIS] and Water Science Centers, National Resources Conservation Service [NRCS])
 - Springs (USGS NWIS)
 - Groundwater basin(s) (state water agency)
 - Wetlands (USFWS National Wetlands Inventory [NWI] or state agency)
 - Playas and dry lakes (USGS NHD or state agency)
 - Meteorological station locations (USGS NWIS, Western Regional Climate Center [WRCC], state agency climate stations, e.g., California Irrigation Management Information System [CIMIS] in California)
- Tabular information
 - Canals and perennial and intermittent streams (USGS NHD)
 - Total length of ephemeral stream channels (USGS NHD)
 - Total length of stream channels by stream order (USGS NHD)
 - Annual, seasonal, peak discharge values (USGS NWIS and Water Science Centers)
 - HUC8 watershed areas (USGS NHD)

Riverside East SEZ Data Needs

- Groundwater basins—area, generic properties (state water agency, PEIS, USGS NWIS and Water Science Centers, NRCS)
- Wetlands—areas, types (USFWS NWI or state agency)
- Springs—names, elevations, flows (USGS NWIS or state agency)
- Climate—precipitation, snowfall, evapotranspiration (USGS NWIS, WRCC, state agencies)

The following planning-level inventory data were not provided in the Final Solar PEIS, but would be useful to assemble prior to solar development in any SEZ:

- Google Earth™/geographic information system (GIS) data files, providing links to datasets (USGS NWIS)
 - Stream gages—flows and water quality
 - Groundwater wells—depth to groundwater and water quality
 - Meteorological stations—temperatures, precipitation, snowfall, etc.

2 Floodplain Determinations

In May 27, 1977, the President signed Executive Order 11988 “Floodplain Management,” which states that federal agencies should avoid surface disturbance activities within identified 100-year floodplains (*Federal Register*, Volume 42, page 117, May 27, 1977). Only a few SEZs (Afton, Dry Lake, Imperial East, and Gillespie) have prior floodplain analyses available to map exclusion floodplain areas. Identifying 100-year floodplain areas must be performed in order to define non-development areas within SEZs. Given the episodic and sometimes catastrophic nature of rainfall-runoff events in the desert southwest, floodplain analyses could extend beyond the 100-year floodplain to regions susceptible to extreme flooding events (e.g. alluvial fans, high gradient areas).

Except for the SEZs listed above, floodplain determinations had not been completed at the time of publication of the Final Solar PEIS and are still needed. Floodplain determinations require field surveys, consultations with the Federal Emergency Management Agency (FEMA) and state/local flood control agencies, and hydrologic analyses. The primary steps to identifying floodplain areas include the following:

- Identifying of main surface drainage pathways within and adjacent to SEZs
- Consulting with FEMA and state/local flood control agencies regarding floodplain mapping protocols
- Conducting field surveys
 - Channel geometries
 - High-water-mark indicator maps
 - Ground-truthing NHD channel networks
- Performing hydrologic analyses
 - Analysis of flood frequency
 - Hydraulic modeling of runoff routing

- Determination of inundation areas
- Obtaining approvals (BLM-coordinated)
 - FEMA/agency for floodplains

3 Jurisdictional Waters Determinations

Section 404 of the Clean Water Act (CWA) requires a permitting process for dredging and filling activities affecting “jurisdictional waters” of the United States. The U.S. Army Corps of Engineers (USACE) and EPA oversee the permitting process and make determinations on what constitutes jurisdictional water on a case-by-case basis. Jurisdictional water determinations can be made by using a variety of techniques, including topographic maps and aerial photographs, field surveys, and hydrologic analyses. The appropriate method for jurisdictional water determinations must be coordinated with the appropriate offices of the USACE and EPA. If field surveys are required, coordination with field surveys for floodplain determinations should be made. Jurisdictional water determinations for the SEZs had not been completed at the time of publication of the Final Solar PEIS and are still needed. Jurisdictional water determinations will not define non-development areas within SEZs but will determine where CWA Section 404 permitting will be required.

4 Significant Ephemeral Waters Determinations

In addition to floodplains and jurisdictional waters, several commenters and cooperators on the Draft Solar PEIS had concerns regarding the loss of ephemeral stream networks because of their importance to hydrology, geomorphology, and habitat. The Draft Solar PEIS identified significant washes to be excluded from development that showed physical evidence of conveying substantial flood flows (these areas will likely overlap with 100-year floodplain mapping). The Final Solar PEIS identified sensitive stream reaches for each SEZ on the basis of available geospatial datasets and professional judgment. Further analyses should be performed to identify dense ephemeral stream networks that overlap with critical habitat, provide significant groundwater connectivity, or constitute critical geomorphic features necessary for maintaining connected features (e.g., dunes, eolian transport corridors, and active alluvial fans). These additional analyses should use high-resolution imagery to identify stream reaches not accounted for in FPEIS analysis, as well as include consultation with local BLM offices, cooperating federal agencies, and state agencies regarding critical ephemeral stream networks for habitat, hydrologic, and geomorphic value.

5 Monitoring and Adaptive Management Programs

Careful siting and planning of solar facilities can reduce adverse impacts on surface water and groundwater resources, but there are many unknowns regarding both surface water and groundwater processes. Establishing a robust monitoring program and analysis tools for SEZs would gain important information on whether surface water or groundwater resources are being affected by solar facilities. Monitoring programs would need to incorporate stakeholder involvement including appropriate federal/state/local agencies (e.g., local BLM offices, USGS Water Science Centers, USFWS, National Park Service [NPS], state water resources agencies)

that conduct water resources monitoring. The Final Solar PEIS recommended a process and methods and tools for developing SEZ monitoring programs for water resources. The process should include identifying a stakeholder monitoring committee including agencies involved with water rights and resources. The committee should oversee the development and implementation of a monitoring program. The basic components of surface water and groundwater monitoring programs should include recommended monitoring parameters, measuring frequency, a plan for stakeholder involvement. The monitoring program could also include new or modified design features for the SEZ, such as a requirement to have water flow meters on groundwater pumps to accurately measure extractions (to be used in groundwater models and analyses to support long, term monitoring programs).

6 Groundwater Analyses

Utility-scale solar energy facilities have the potential to affect groundwater. For the Final Solar PEIS, an analysis of potential groundwater impacts for each SEZ was done quantitatively using a simple one-dimensional groundwater modeling approach (BLM and DOE 2012, Appendix O) and qualitatively by summarizing available information relative to groundwater processes and comparing that information to estimates of potential groundwater extractions for the four main solar energy technologies evaluated. The level of groundwater analysis needed for each SEZ will vary depending on the proposed level of water use (e.g., less detailed analyses may be needed for photovoltaic [PV] facilities than for higher water use facilities such as parabolic trough).

Seven SEZs were identified in the Final PEIS that would benefit from a more quantitative analysis: Afton, Amargosa Valley, Brenda, Dry Lake, Dry Lake Valley North, Imperial East, and Riverside East. At these seven SEZs, numerical groundwater models are being used to better address two major concerns: potential drawdown impacts on surface water features (e.g., loss of springs, change in river discharge) and drawdown impacts on other groundwater users and groundwater processes. Where there are existing groundwater models, the following will be added:

- Groundwater model refinements for SEZ analysis, and
- Analyses of full build-out pumping scenarios.

Where there are not existing groundwater models, the following will be provided:

- Simplified, superposition-based, groundwater modeling; and
- Analyses of full build-out pumping scenarios.

The groundwater models and reports for these SEZ will be released through the SEZ pages of the Solar Energy Program Implementation Web Site (<http://blmsolar.anl.gov/sez>) as they become available.