FES 12-24 • DOE/EIS-0403

Final Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern States

Executive Summary
(Electronic copies of the Draft and Final Solar PEIS included)

July 2012

Bureau of Land Management
U.S. Department of Energy

Final Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern States (FES 12-24; DOE/EIS-0403)

Responsible Agencies: The U.S. Department of the Interior (DOI) Bureau of Land Management (BLM) and the U.S. Department of Energy (DOE) are co-lead agencies. Nineteen cooperating agencies participated in the preparation of this PEIS: U.S. Department of Defense; U.S. Bureau of Reclamation; U.S. Fish and Wildlife Service; U.S. National Park Service; U.S. Environmental Protection Agency, Region 9; U.S. Army Corps of Engineers, South Pacific Division; Arizona Game and Fish Department; California Energy Commission; California Public Utilities Commission; Nevada Department of Wildlife; N-4 Grazing Board, Nevada; Utah Public Lands Policy Coordination Office; Clark County, Nevada, including Clark County Department of Aviation; Doña Ana County, New Mexico; Esmeralda County, Nevada; Eureka County, Nevada; Lincoln County, Nevada; Nye County, Nevada; and Saguache County, Colorado.

Locations: Arizona, California, Colorado, Nevada, New Mexico, and Utah.

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Abstract: The BLM and DOE have jointly prepared this PEIS to evaluate actions that the agencies are considering taking to further facilitate utility-scale solar energy development in six southwestern states.[1] For the BLM, this includes the evaluation of a new Solar Energy Program applicable to solar development on BLM-administered lands. For DOE, it includes the evaluation of developing new guidance to further facilitate utility-scale solar energy development and maximize the mitigation of associated potential environmental impacts. This Solar PEIS evaluates the potential environmental, social, and economic effects of the agencies' proposed actions and alternatives in accordance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality's regulations for implementing NEPA (Title 40, Parts 1500–1508 of the *Code of Federal Regulations* [40 CFR Parts 1500–1508]), and applicable BLM and DOE authorities.

For the BLM, the Final Solar PEIS analyzes a no action alternative, under which solar energy development would continue on BLM-administered lands in accordance with the terms and conditions of the BLM's existing solar energy policies, and two action alternatives that involve implementing a new BLM Solar Energy Program that would allow the permitting of future solar energy development projects on public lands to proceed in a more efficient, standardized, and environmentally responsible manner. The proposed program would establish right-of-way authorization policies and design features applicable to all utility-scale solar energy development on BLM-administered lands. It would identify categories of lands to be excluded from utility-scale solar energy development and specific locations well suited for utility-scale production of solar energy where the BLM would prioritize development (i.e., solar energy zones or SEZs). The proposed action would also allow for responsible utility-scale solar development on lands outside of priority areas.

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1 Utility-scale facilities are defined as projects that generate electricity that is delivered into the electricity transmission grid, generally with capacities greater than 20 megawatts (MW).

For DOE, the Final PEIS analyzes a no action alternative, under which DOE would continue to address environmental concerns for DOE-supported solar projects on a case-by-case basis, and an action alternative, under which DOE would adopt programmatic environmental guidance for use in DOE-supported solar projects.

The BLM and DOE initiated the Solar PEIS process in May 2008. On December 17, 2010, the BLM and DOE published the Draft Solar PEIS. Subsequently, on October 28, 2011, the lead agencies published the Supplement to the Draft Solar PEIS, in which adjustments were made to elements of BLM's proposed Solar Energy Program to better meet BLM's solar energy objectives, and in which DOE's proposed programmatic environmental guidance was presented.

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EXECUTIVE SUMMARY

ES.1 BACKGROUND

The U.S. Department of the Interior (DOI) Bureau of Land Management (BLM) and U.S Department of Energy (DOE) have jointly prepared this programmatic environmental impact statement (PEIS) to evaluate actions that the agencies are considering taking to further facilitate utility-scale solar energy development in six southwestern states (Arizona, California, Colorado, Nevada, New Mexico, and Utah).[1] For the BLM, this includes the evaluation of a new Solar Energy Program applicable to solar development on BLM-administered lands. For DOE, it includes the evaluation of developing new guidance to further facilitate utility-scale solar energy development and maximize the mitigation of associated environmental impacts. This Solar PEIS evaluates the potential environmental, social, and economic effects of the agencies' proposed actions and alternatives in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality's regulations for implementing NEPA (Title 40, Parts 1500–1508 of the *Code of Federal Regulations* [40 CFR Parts 1500–1508]), the DOI and DOE regulations for implementing NEPA (43 CFR Part 46 and 10 CFR Part 1021, respectively), and applicable BLM and DOE authorities.

The BLM and DOE initiated the Solar PEIS process in May 2008. Since that time, the agencies have engaged extensively with their cooperating agencies, key stakeholders, and the general public to obtain input on the scope and objectives of their proposed actions. On the basis of this input, as appropriate, the agencies have incrementally refined their proposed actions, alternatives, and analyses. On December 17, 2010, the BLM and DOE published the *Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States* (BLM and DOE 2010); the Notice of Availability (NOA) was published in the *Federal Register*, Volume 75, page 78980. During the comment period, the public, as well as many cooperating agencies and key stakeholders, offered suggestions on how the BLM and DOE could increase the utility of the analysis, strengthen elements of the BLM's proposed Solar Energy Program, and increase certainty regarding solar energy development on BLM-administered lands. Subsequently, on October 28, 2011, the lead agencies published the Supplement to the Draft Solar PEIS (BLM and DOE 2011), in which adjustments were made to elements of the proposed Solar Energy Program and to guidance for facilitating utility-scale solar energy development to better meet BLM and DOE's solar energy objectives. The NOA for the Supplement to the Draft Solar PEIS was published in the *Federal Register*, Volume 76, page 66958.

ES.2 BLM PROPOSED ACTION

The BLM proposes to develop a new Solar Energy Program to further support utility-scale solar energy development on BLM-administered lands in the six-state study area. The

[1] Utility-scale facilities are defined as projects that generate electricity that is delivered into the electricity transmission grid, generally with capacities greater than 20 megawatts (MW)

proposed Solar Energy Program would replace certain elements of BLM's existing solar energy policies with a comprehensive program that would allow the permitting of future solar energy development projects on public lands to proceed in a more efficient, standardized, and environmentally responsible manner. The proposed program would establish right-of-way (ROW) authorization policies and design features applicable to utility-scale solar energy development on BLM-administered lands. It would identify categories of lands to be excluded from utility-scale solar energy development and identify specific locations well suited for utility-scale production of solar energy where the BLM would prioritize development (i.e., solar energy zones, or SEZs). The proposed action would also allow for responsible utility-scale solar development on lands outside of priority areas.

ES.2.1 BLM Purpose and Need

The BLM has identified a need to respond in a more efficient and effective manner to the high interest in siting utility-scale solar energy development on public lands and to ensure consistent application of measures to mitigate the potential adverse impacts of such development.

The BLM is therefore considering replacing certain elements of its existing solar energy policies with a comprehensive Solar Energy Program. While the proposed Solar Energy Program will further BLM's ability to meet the mandates of Executive Order (E.O.) 13212,"Actions to Expedite Energy-Related Projects" (*Federal Register*, Volume 66, page 28357, May 22, 2001), and the Energy Policy Act of 2005, it also has been designed to meet the requirements of DOI Secretarial Order 3285SA1 (Secretary of the Interior 2010) related to identifying and prioritizing specific locations best suited for utility-scale solar energy development on public lands (see Section 1.1 of this Final Solar PEIS for a discussion of these and other applicable federal orders and mandates).

The objectives of BLM's proposed Solar Energy Program include the following:

- Facilitate near-term utility-scale solar energy development on public lands;
- Minimize potential negative environmental impacts;
- Minimize social and economic impacts;
- Provide flexibility to the solar industry to consider a variety of solar energy projects (location, facility size, technology, etc.);
- Optimize existing transmission infrastructure and corridors;
- Standardize and streamline the authorization process for utility-scale solar energy development on BLM-administered lands; and
- Meet projected demand for solar energy development.

The elements of BLM's proposed Solar Energy Program include the following:

1. Commitment to process pending applications for utility-scale solar energy development that meet due diligence and siting provisions under existing land use plans and other policies and procedures;

2. Identification of lands to be excluded from utility-scale solar energy development in the six-state study area;

3. Establishment of a process to identify new or expanded SEZs;

4. Identification of priority areas (i.e., SEZs) that are well suited for utility-scale production of solar energy in accordance with the requirements of Secretarial Order 3285A1 and the associated authorization procedures for applications in these areas;

5. Establishment of a process that allows for responsible utility-scale solar energy development outside of SEZs (i.e., variance process);

6. Establishment of design features for solar energy development on public lands to ensure the most environmentally responsible development and delivery of solar energy; and

7. Amendment of BLM land use plans in the six-state study area to adopt those elements of the new Solar Energy Program that pertain to planning.

ES.2.2 BLM Scope of Analysis

The geographic scope of the PEIS for the BLM includes all BLM-administered lands in the six-state study area. The scope of the impact analysis includes an assessment of the potential environmental, social, and economic impacts of utility-scale solar facilities and required transmission connections from these facilities to the existing electricity transmission grid and other associated infrastructure such as roads over an approximately 20-year time frame (i.e., until about 2030).

The scope of this analysis is limited to utility-scale solar energy development. For the purposes of the Solar PEIS and associated decision making, utility-scale solar energy development is defined as any project capable of generating 20 megawatts (MW) or more. As a result, BLM's new Solar Energy Program would apply only to projects of this scale; decisions on projects that are less than 20 MW would continue to be made in accordance with existing land

use plan requirements,[2] current applicable policy and procedures, and individual site-specific NEPA analyses. Viable utility-scale solar technologies considered likely to be deployed over the next 20 years and analyzed as part of the Solar PEIS include parabolic trough, power tower, dish engine systems, and photovoltaic (PV) systems.

The Solar PEIS considers the potential direct, indirect, and cumulative effects of establishing broad Solar Energy Program elements and strategies across the six-state study area. This programmatic analysis considers potential environmental effects over a broad geographic and time horizon and, as a result, it is fairly general, focusing on major impacts in a qualitative manner. In addition to the programmatic analysis, the Solar PEIS also provides in-depth data collection and environmental analysis for the proposed SEZs. The primary purpose of this more rigorous SEZ-specific 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.

ES.2.3 Applications for Solar Energy Development on BLM Lands

As of May 31, 2012, the BLM had approved 11 utility-scale solar projects on public lands and 5 linear ROWs that enabled development of projects on private lands (See Table B-1 of Appendix B of this Final Solar PEIS). As stated in the Supplement to the Draft Solar PEIS and reaffirmed in this Final Solar PEIS, the BLM is committed to continued processing of all pending[3] solar energy applications that meet due diligence and siting requirements under existing land use plans and other policies and procedures that the BLM has adopted or might adopt. Pending applications will *not* be subject to any new program elements adopted by the Solar PEIS ROD. All new[4] applications, however, will be subject to the program elements adopted by the Solar PEIS ROD.

ES.2.4 BLM Alternatives

As discussed in Chapter 2, through this PEIS, the BLM is evaluating three alternatives for managing utility-scale solar energy development on BLM-administered lands in the six-state study area. These alternatives include two action alternatives—a solar energy development program alternative and an SEZ program alternative—and a no action alternative. The solar energy development program alternative is BLM's preferred alternative.

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[2] Co-generation projects involving a mix of solar energy technologies and other energy technologies (e.g., natural gas, wind, and hydropower) would be subject to the requirements of the new Solar Energy Program if the solar energy component is 20 MW or greater.

[3] The BLM defines "pending" applications as any applications (regardless of place in line) filed within proposed variance and/or exclusion areas before the publication of the Supplement to the Draft Solar PEIS (October 28, 2011), and any applications filed within proposed SEZs before June 30, 2009.

[4] The BLM defines "new" applications as any applications filed within proposed SEZs after June 30, 2009, and any applications filed within proposed variance and/or exclusion areas after the publication of the Supplement to the Draft Solar PEIS (October 28, 2011).

The alternatives are summarized in the following sections. Table ES.2-1 identifies the estimated amount of land that would be available for ROW application under each alternative by state. Figures ES.2-2 through ES.2-7, provided after Section ES.2.4.7, show the approximate locations of those lands proposed for exclusion, lands available for solar ROW applications, and priority SEZs.

ES.2.4.1 Program Elements Common to Both BLM Action Alternatives

Under BLM's proposed action alternatives, the Solar Energy Program would include comprehensive ROW authorization policies; requirements for monitoring, adaptive management and mitigation, and programmatic design features that would avoid, minimize, and/or mitigate the potential adverse effects of solar energy development. These elements, which are summarized below, are described in detail in Section 2.2.1 of this Final Solar PEIS.

ES.2.4.1.1 ROW Authorization Policies

The BLM proposes a number of ROW authorization policies that would be applicable to solar energy ROWs on all BLM-administered lands. These include, but are

TABLE ES.2-1 Summary of Potentially Developable BLM-Administered Land under the No Action Alternative, the Solar Energy Development Program Alternative, and the SEZ Program Alternative[a]

State	Total State Acreage	BLM-Administered Lands Constituting No Action Alternative (acres)	BLM-Administered Lands Constituting Solar Energy Development Program Alternative (acres)[b,c]	BLM-Administered Lands Constituting SEZ Program Alternative (acres)
Arizona	72,700,000	9,181,179	3,380,877	5,966
California	100,200,000	10,815,285	766,078	153,627
Colorado	66,500,000	7,282,258	95,128	16,308
Nevada	70,300,000	40,760,443	9,076,145	60,395
New Mexico	77,800,000	11,783,665	4,184,520	29,964
Utah	52,700,000	18,098,240	1,809,759	18,658
Total	440,200,000	97,921,069	19,312,506	284,918

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

[b] The acreage estimates were calculated on the basis of the best available geographic information system (GIS) data. GIS data were not available for the entire set of exclusions; thus the exact acreage could not be calculated. Exclusions that could not be mapped would be identified during the ROW application process.

[c] Values shown include areas of less than 247 acres (1 km^2).

not limited to, policies addressing competing applications, terms, ROWs, and changes to terms; ROW renewal; cost-recovery payments; valid existing rights; rental fees; due diligence and applicant qualifications; plans of development; notification to livestock grazing operators; performance and reclamation bonds; notice to proceed; administrative appeal; air navigation hazards;, cadastral survey policies; diligent development; operating standards; access to records; upgrades or changes to facility design or operation; 10-year reviews; and transfers or assignments requiring BLM approval. The BLM is undertaking rulemaking to establish a competitive process for offering public lands for solar as well as wind energy development within designated leasing areas (i.e., SEZs). When established, the rule may supersede some of the authorization policies described in the Final Solar PEIS.

ES.2.4.1.2 Monitoring, Adaptive Management, and Mitigation

The BLM has committed to developing and incorporating a monitoring and adaptive management plan into its Solar Energy Program to ensure that data and lessons learned about the impacts of solar energy projects will be collected, reviewed, and, as appropriate, incorporated into BLM's Solar Energy Program in the future. The long-term solar monitoring and adaptive management plan (Solar LTMP) will be based on BLM's Assessment, Inventory and Monitoring (AIM) Strategy developed in 2011. It will also take advantage of and augment other AIM efforts, including Rapid Ecoregional Assessments, the national landscape monitoring framework, greater sage-grouse habitat analysis, and an array of local, management-driven monitoring efforts.

BLM's proposed Solar Energy Program under both action alternatives will employ a mitigation hierarchy to address potential impacts—avoidance, minimization, and offset of unavoidable impacts. Avoidance will be achieved through siting decisions and the identification of priority SEZs. Minimization will be achieved through the application of design features and adherence to applicable federal, state, and local laws and regulations such as the Endangered Species Act (ESA). For those impacts that cannot be avoided or minimized, the BLM will determine, in consultation with affected stakeholders, if measures to offset or mitigate adverse impacts would be appropriate. To help accomplish this goal, the BLM proposes to establish regional mitigation plans that will facilitate development in SEZs. As envisioned, these regional mitigation plans will simplify and improve the mitigation process for future projects in SEZs.

ES.2.4.1.3 Programmatic Design Features

The BLM has established a set of proposed programmatic design features that would be required for all utility-scale solar energy development on BLM-administered lands under both action alternatives. Design features are mitigation requirements that have been incorporated into the proposed action or alternatives to avoid or reduce adverse impacts. The proposed design features were derived from comprehensive reviews of solar energy development activities, published data regarding solar energy development impacts, existing relevant mitigation guidance, and standard industry practices.

ES.2.4.2 Solar Energy Development Program Alternative (BLM Preferred Alternative)

Under the solar energy development program alternative (referred to as the "program alternative"), the BLM proposes categories of lands to be excluded from utility-scale solar energy development and identifies specific locations well suited for utility-scale production of solar energy (i.e., SEZs) where the BLM proposes to prioritize development. The program alternative emphasizes and incentivizes development within SEZs and proposes a collaborative process to identify additional SEZs. To accommodate the flexibility described in the BLM's program objectives, the program alternative allows for responsible utility-scale solar development in variance areas outside of SEZs in accordance with the proposed variance process. The program alternative also establishes programmatic authorization policies and design features for utility-scale solar energy development on BLM-administered lands. The elements of the new Solar Energy Program would be implemented through amendment of the land use plans within the six-state study area (see Appendix C of this Final Solar PEIS).

ES.2.4.2.1 Proposed Right-of-Way Exclusion Areas

Under the program alternative, the BLM proposes to exclude specific categories of land from utility-scale solar energy development. Right-of way exclusion areas are defined as areas that are not available for location of ROWs under any conditions (BLM Land Use Planning Handbook, H-1601-1 [BLM 2005]). On the basis of input received from the public, stakeholders, cooperating agencies, and tribes on the Supplement to the Draft Solar PEIS, the list of proposed exclusions has been modified and now totals approximately 79 million acres (319,072 km^2), including some state-specific exclusions (see Table ES.2-2 and Figure ES.2-1).

The identification of exclusion areas allows the BLM to support the highest and best use of public lands by avoiding potential resource conflicts and reserving for other uses public lands that are not well suited for utility-scale solar energy development. Due to the size and scale of utility-scale solar energy development (typically involving a single use of public lands), the BLM is proposing to exclude a broader set of categories than would be identified in a land use plan for other types of ROWs. For the purposes of the Solar PEIS and its associated NEPA analysis, the BLM has mapped and estimated the acreage for all proposed exclusions in the aggregate based on best available existing information. The identification of any additional exclusion areas for utility-scale solar energy development would involve planning-level decisions and require the BLM to amend applicable land use plans.

ES.2.4.2.2 Proposed Solar Energy Zones

An SEZ is defined by the BLM as an area within which the BLM will prioritize and facilitate utility-scale production of solar energy and associated transmission infrastructure development. SEZs should be relatively large areas that provide highly suitable locations for utility-scale solar development: locations where solar development is economically and technically feasible, where there is good potential for connecting new electricity-generating

TABLE ES.2-2 Exclusions under BLM's Solar Energy Development Program Alternative

1. Lands with slopes greater than 5% determined through geographical information system (GIS) analysis using digital elevation models.[a]
2. Lands with solar insolation levels less than 6.5 kWh/m^2/day determined through National Renewable Energy Laboratory solar radiation GIS data (http://www.nrel.gov/rredc/solar_data.html).
3. All Areas of Critical Environmental Concern (ACECs) identified in applicable land use plans (including Desert Wildlife Management Areas [DWMAs] in the California Desert District planning area).
4. All designated and proposed critical habitat areas for species protected under the Endangered Species Act (ESA) of 1973 (as amended) as identified in respective recovery plans (http://ecos.fws.gov/tess_public/TESSWebpageRecovery?sort=1).
5. All areas for which an applicable land use plan establishes protection for lands with wilderness characteristics.
6. Developed recreational facilities, special-use permit recreation sites (e.g., ski resorts and camps), and all Special Recreation Management Areas (SRMAs) identified in applicable land use plans, except for those in the State of Nevada and a portion of the Yuma East SRMA in Arizona.[b]
7. All areas where the BLM has made a commitment to state agency partners and other entities to manage sensitive species habitat, including but not limited to sage grouse core areas, nesting habitat, and winter habitat; Mohave ground squirrel habitat; flat-tailed horned lizard habitat; and fringe-toed lizard habitat.
8. Greater sage-grouse habitat (currently occupied, brooding, and winter habitat) as identified by the BLM in California, Nevada, and Utah, and Gunnison's sage-grouse habitat (currently occupied, brooding, and winter habitat) as identified by the BLM in Utah.[c]
9. All areas designated as no surface occupancy (NSO) in applicable land use plans
10. All right-of-way (ROW) exclusion areas identified in applicable land use plans.
11. All ROW avoidance areas identified in applicable land use plans.
12. In California, lands classified as Class C in the California Desert Conservation Area (CDCA) planning area.
13. In California and Nevada, lands in the Ivanpah Valley.
14. In Nevada, lands in Coal Valley and Garden Valley.
15. All Desert Tortoise translocation sites identified in applicable land use plans, project-level mitigation plans or Biological Opinions.
16. All Big Game Migratory Corridors identified in applicable land use plans.
17. All Big Game Winter Ranges identified in applicable land use plans.
18. Research Natural Areas identified in applicable land use plans.

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TABLE ES.2-2 (Cont.)

19. Lands classified as Visual Resource Management (VRM) Class I or II (and, in Utah, Class III[d]) in applicable land use plans.

20. Secretarially designated National Recreation, Water, or Side and Connecting Trails and National Back Country Byways (BLM State Director approved) identified in applicable BLM and local land use plans (available at http://www.americantrails.org/NRTDatabase), including any associated corridor or lands identified for protection through an applicable land use plan.

21. All units of the BLM National Landscape Conservation System, congressionally designated National Scenic and Historic Trails (National Trails System Act [NTSA], P.L. 90-543, as amended), and trails recommended as suitable for designation through a congressionally authorized National Trail Feasibility Study, or such qualifying trails identified as additional routes in law (e.g., West Fork of the Old Spanish National Historic Trail), including any trail management corridors identified for protection through an applicable land use plan. Trails undergoing a congressionally authorized National Trail Feasibility Study will also be excluded pending the outcome of the study.[e]

22. National Historic and Natural Landmarks identified in applicable land use plans, including any associated lands identified for protection through an applicable land use plan.

23. Lands within the boundaries of properties listed in the *National Register of Historic Places* (NRHP) and any additional lands outside the designated boundaries identified for protection through an applicable land use plan.

24. Traditional cultural properties and Native American sacred sites as identified through consultation with tribes and recognized by the BLM.

25. Wild, Scenic, and Recreational Rivers designated by Congress, including any associated corridor or lands identified for protection through an applicable river corridor plan.

26. Segments of rivers determined to be eligible or suitable for Wild or Scenic River status identified in applicable land use plans, including any associated corridor or lands identified for protection through an applicable land use plan.

27. Old Growth Forest identified in applicable land use plans.

28. Lands within a solar energy development application area found to be inappropriate for solar energy development through an environmental review process that occurred prior to finalization of the Draft Solar PEIS.[f]

29. Lands previously proposed for inclusion in SEZs that were determined to be inappropriate for development through the NEPA process for the Solar PEIS (limited to parts of the Brenda SEZ in Arizona; the previously proposed Iron Mountain SEZ area and parts of the Pisgah and Riverside East SEZs in California; parts of the De Tilla Gulch, Fourmile East, and Los Mogotes East SEZs in Colorado; and parts of the Amargosa Valley SEZ in Nevada).

30. In California, all lands within the proposed Mojave Trails National Monument[g] and all conservation lands acquired outside of the proposed Monument through donations or use of Land and Water Conservation Funds.

31. In California, BLM-administered lands proposed for transfer to the National Park Service with the concurrence of the BLM.[h]

TABLE ES.2-2 (Cont.)

32.	Specific areas identified since the publication of the Supplement to the Draft Solar PEIS by the BLM based on continued consultation with cooperating agencies and tribes to protect sensitive natural, visual, and cultural resources (total of 1,066,497 acres [4,316 km^2]; see Figure ES.2-1. Note there are some overlapping exclusions). Data and finer scale maps will be made available through the Solar PEIS project Web site (http://solareis.anl.gov). Note that in some cases, the description of these areas will be withheld from the public to ensure protection of the resource.

[a] Applications may include some lands with up to 10% slope where higher slopes inclusions meet all of the following: (1) are proximate to variance lands in the application, (2) are not otherwise excluded from development, (3) allow for the avoidance or minimization of resource conflicts, and (4) do not create any significant new or additional conflicts. In such cases, a land use plan amendment would have to be adopted as part of the project-specific analysis to permit the slope exception.

[b] In Nevada, many designated SRMAs are located on semi-degraded lands that might be appropriate for solar development. Decisions on solar ROW applications within Nevada SRMAs will be made on a case-by-case basis. A portion of the Yuma East SRMA was identified as a variance area rather than as an exclusion area based on its designation as VRM Class III and as a rural developed recreation setting, both of which allow for modifications to the natural environment.

[c] In April 2010, the USFWS published its listing for the greater sage-grouse as "Warranted but Precluded." Inadequacy of regulatory mechanisms was identified as a major threat in the USFWS finding on the petition to list the greater sage-grouse. The USFWS has identified the principal regulatory mechanism for the BLM as conservation measures in RMPs. On the basis of the identified threats to the greater sage-grouse and the USFWS's time line for making a listing decision on this species, the BLM has initiated action to incorporate explicit objectives and adequate conservation measures into RMPs (including PEISs and project EISs) within the next 3 years in order to conserve greater sage-grouse and avoid a potential listing under the ESA. To meet the objectives of BLM's sage-grouse conservation policy, the Solar PEIS has excluded specifically identified sage-grouse habitat (currently occupied, brooding, and winter habitat) located on BLM public lands in Nevada and Utah. These exclusions will be subject to change based on the outcome of the BLM's sage grouse planning efforts and resulting plan amendments.

[d] In Utah, VRM Class III lands have also been removed due to the high sensitivity and location proximity to Zion, Bryce, Capital Reef, Arches, and Canyonlands National Parks, and to significant Cultural Resource Special Management Areas (in southeast Utah).

[e] National Scenic Trails are comprised of extended pathways located for recreational opportunities and the conservation and enjoyment of the scenic, historic, natural, and cultural qualities of the areas through which they pass (NTSA Sec. 3(a)(2)).

National Historic Trails are comprised of Federal Protection Components and/or high-potential historic sites and high-potential route segments, including original trails or routes of travel, developed trail or access points, artifacts, remnants, traces, and the associated settings and primary uses identified and protected for public use and enjoyment (NTSA Sec. 3(a)(3)) and may include associated auto tour routes (NTSA Sec. 5(b)(A) and 7(c)). National Historic Trails or other types of historic trails may also contain properties listed or eligible for listing on the NRHP or National Historic Landmarks. National Historic Trails are protected and identified as required by law (NTSA Sec. 3(a)(3)), through BLM inventory and planning processes.

[f] For example, lands considered non-developable in the environmental analyses completed for the Genesis Ford Dry Lake Solar Project, Blythe Solar Project, and Desert Sunlight Solar Project, and some lands previously within the Pisgah and Brenda proposed SEZs.

Footnotes continued on next page

TABLE ES.2-2 (Cont.)

[g] As described in Senate Bill 138, California Desert Protection Act of 2011, introduced in the 112th Congress.

[h] Three specific geographic areas described as (1) the narrow strip of BLM-administered lands between Fort Irwin and Death Valley National Park, (2) an area of public lands on the northeastern side of Mojave National Preserve adjacent to the California and Nevada border, and (3) an area along the northern boundary of Joshua Tree National Park.

plants to the transmission distribution system, and where there is generally low resource conflict. ROWs for utility-scale solar energy development in SEZs would be given priority over all other ROWs. The BLM may decide to authorize ROWs for other uses that are found to be compatible with utility-scale solar energy development such as shared access roads and transmission lines. The BLM will consider the processing of pending ROW applications in identified SEZs on a case-by-case basis.

Through the Draft Solar PEIS, the BLM conducted SEZ-specific analysis for 24 SEZs (approximately 677,000 acres [2,741 km^2]) and discovered some potentially significant impacts on various resources and resource uses that could result from solar energy development in these areas. Based on this analysis, the BLM decided to eliminate some SEZs from further consideration and reduce the area of other SEZs. The BLM has carried 17 SEZs forward for analysis in the Final Solar PEIS. These SEZs total approximately 285,000 acres (1,153 km^2) of land potentially available for development (see Table ES.2-3). Chapters 8 through 13 of the Draft and Final Solar PEIS include assessments of the affected environment and potential environmental impacts of solar energy development in each of the SEZs. This SEZ-specific analysis provides documentation from which the BLM will tier future project authorizations, thereby limiting the required scope and effort of additional project-specific NEPA analyses. The extent of tiering will vary from project to project, as will the necessary level of NEPA documentation.

The BLM will require that utility-scale solar energy projects in SEZs be developed in compliance with NEPA and other applicable laws, including, but not limited to the ESA and the National Historic Preservation Act (NHPA), and applicable regulations and policies. The BLM has already undertaken ESA consultation, NHPA Section 106 consultation, and tribal consultation for the SEZs that will further limit the level of effort required to authorize projects in SEZs in the future.

The BLM developed action plans for each of the 17 SEZs as part of the Supplement to the Draft Solar PEIS (Appendix C of the Supplement). 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. Through implementation of these action plans, the BLM is committed to obtaining additional SEZ-specific resource data and conducting additional analysis in order to more effectively facilitate future development in SEZs.

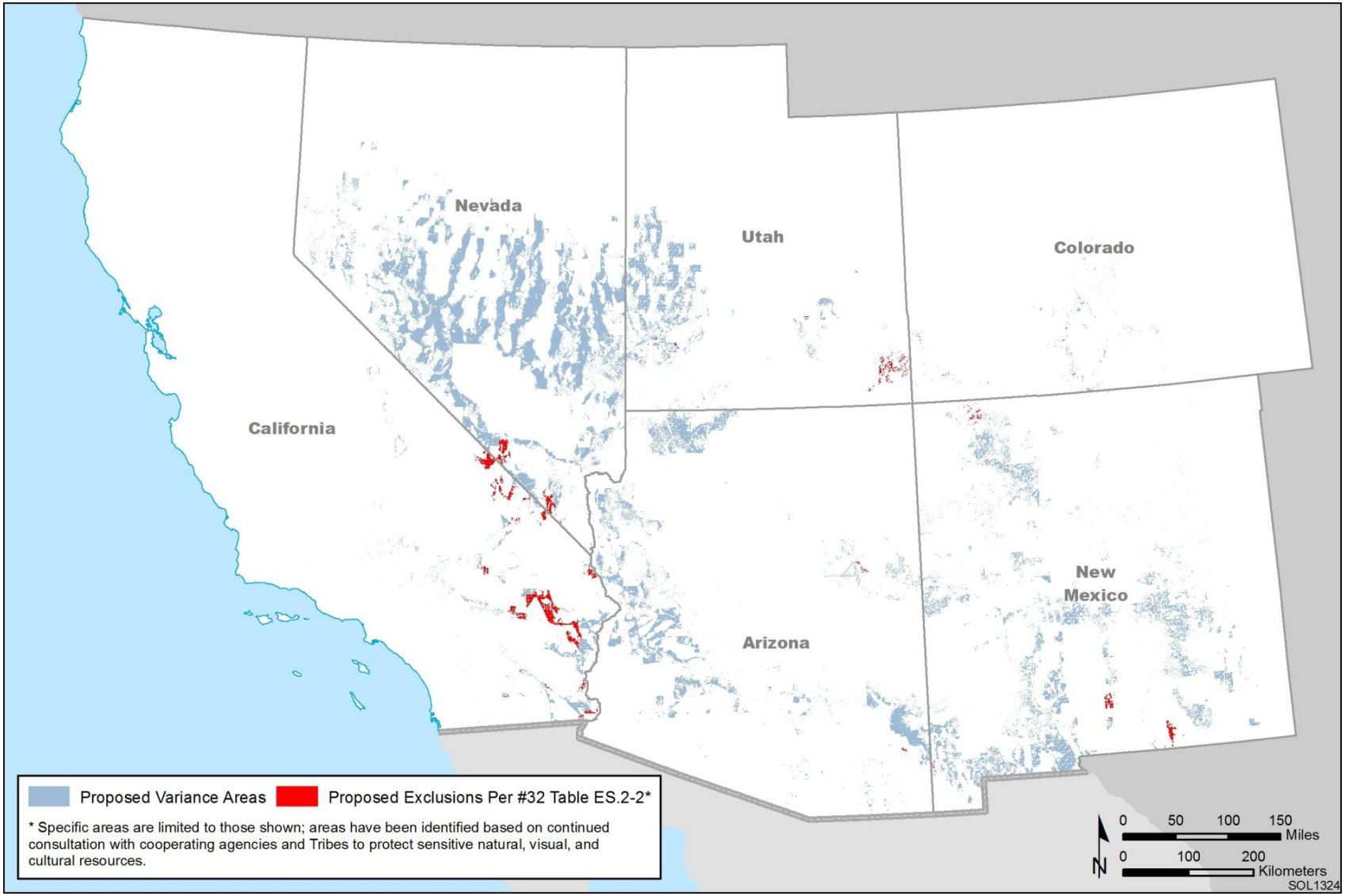

FIGURE ES.2-1 Areas Proposed for Exclusion Since Publication of the Supplement to the Draft Solar PEIS Based on Continued Consultation with Cooperating Agencies and Tribes

TABLE ES.2-3 Proposed SEZs and Approximate Acreage by State[a]

Proposed SEZ (BLM Office/County)	Approximate Acreage
Arizona	
Brenda (Lake Havasu/La Paz)	3,348
Gillespie (Lower Sonoran/Maricopa)	2,618
Total	5,966
California	
Imperial East (El Centro/Imperial)	5,717
Riverside East (Palm Springs–South Coast/Riverside)	147,910
Total	153,627
Colorado	
Antonito Southeast (La Jara/Conejos)	9,712
De Tilla Gulch (Saguache/Saguache)	1,064
Fourmile East (La Jara/Alamosa)	2,882
Los Mogotes East (La Jara/Conejos)	2,650
Total	16,308
Nevada	
Amargosa Valley (Southern Nevada/Nye)	8,479
Dry Lake (Southern Nevada/Clark)	5,717
Dry Lake Valley North (Ely/Lincoln)	25,069
Gold Point (Battle Mountain/Esmeralda)	4,596
Millers (Battle Mountain/Esmeralda)	16,534
Total	60,395
New Mexico	
Afton (Las Cruces/Dona Ana)	29,964
Total	29,964
Utah	
Escalante Valley (Cedar City/Iron)	6,533
Milford Flats South (Cedar City/Beaver)	6,252
Wah Wah Valley (Cedar City/Beaver)	5,873
Total	18,658
Total	284,918

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

The BLM has proposed an authorization process for utility-scale solar energy projects proposed in SEZs. It intends to offer lands in SEZs through a competitive process and has initiated rulemaking to establish this process.

The BLM has taken a number of important steps through the Solar PEIS to facilitate future development in SEZs in a streamlined and standardized manner. Through the Solar PEIS ROD, the BLM will amend land use plans in the six-state study area to adopt those elements of

the new Solar Energy Program that pertain to planning. No additional plan amendments are expected to be required to approve projects in identified SEZs.

In addition to the efforts described above to facilitate development in SEZs, the BLM is proposing to undertake a variety of additional activities, or incentives, that will help steer future utility-scale solar energy development to the SEZs. These activities include facilitating faster and easier permitting in the SEZs, improving and facilitating mitigation, facilitating permitting of needed transmission to the SEZs, encouraging solar development on suitable adjacent nonfederal lands, and providing economic incentives for development in SEZs. As an additional mechanism to support the establishment of priority areas for solar energy development, the Secretary of the Interior is considering whether to withdraw the public lands encompassed by SEZs from potentially conflicting uses through the issuance of a Public Land Order.

The BLM believes that establishing a feasible process to identify new or expanded SEZs is an essential element of its overall approach to solar energy development. A part of the program alternatives, the BLM has developed a proposed SEZ identification protocol. New or expanded SEZs will be identified in the context of existing solar market conditions, existing and planned transmission systems, and new (or existing) state or federal policies affecting the level and location of utility-scale solar energy development. The BLM will endeavor to assess the need for new or expanded SEZs a *minimum* of every 5 years in each of the six states covered by the Solar PEIS. The process to identify new or expanded SEZs will be open and transparent, with opportunities for substantial involvement of multiple stakeholders. The BLM will identify new or expanded SEZs at the state- or field-office level as an individual land use planning effort or as part of an ongoing land use plan revision.

The BLM has initiated efforts to identify new SEZs in the states of California, Arizona, Nevada, and Colorado through ongoing state-based efforts (see Section 2.2.2.2.6 of this Final Solar PEIS for more information) and anticipates identifying new or expanded SEZs in the remaining states in the near future. This ongoing work makes effective use of existing collaborative efforts and is expected to result in new or expanded SEZs in these planning areas in the near term. The BLM welcomes industry, environmental organizations, state and local government partners, tribes, and the public to participate in these ongoing efforts to identify new or expanded SEZs and to submit petitions in other areas where they believe new or expanded SEZs are needed (see Section A.2.6 of Appendix A of this Final Solar PEIS).

ES.2.4.2.3 Proposed Variance Process

To accommodate the flexibility described in BLM's program objectives, the program alternative allows for responsible utility-scale solar development outside of SEZs. The BLM proposes to identify lands outside of proposed exclusion areas and SEZs as variance areas for utility-scale solar energy development. Variance areas would be open to application but would require developers to adhere to the proposed variance process (detailed in Section 2.2.2.3.1 of this Final Solar PEIS). Variances may be needed in the near term because the lands identified as SEZs might be insufficient to accommodate demand for utility-scale solar development or may not have access to adequate transmission capacity to facilitate such development. In addition,

there might be market, technological, or site-specific factors that make a project appropriate in a non-SEZ area.

The BLM will consider ROW applications for utility-scale solar energy development in variance areas on a case-by-case basis based on environmental considerations; coordination with appropriate federal, state, and local agencies, and tribes; and public outreach. The responsibility for demonstrating to the BLM and other coordinating parties that a proposal in a variance area will avoid, minimize, and/or mitigate, as necessary, sensitive resources will rest with the applicant. Based on a thorough evaluation of the information provided by an applicant, and the input of federal, state, and local government agencies, tribes, and the public, the BLM will determine whether it is appropriate to continue to process, or to deny, a ROW application submitted through the variance process.

The proposed variance areas and associated variance process would only apply to utility-scale solar development. All non-utility-scale solar energy projects, including distributed generation, would follow existing management prescriptions in BLM land use plans and be subject to individual site-specific NEPA analyses.

ES.2.4.3 Solar Energy Zone Program Alternative

Under the SEZ program alternative (referred to as the "SEZ alternative"), the BLM would restrict utility-scale solar energy development applications to SEZs only, and identify all other lands as exclusion areas for utility-scale solar energy development (approximately 79 million acres [319,701 km^2). Under the SEZ alternative, the same programmatic authorization policies and design features applicable to the program alternative would apply to applications in SEZs. Over time, under the SEZ alternative, new or expanded SEZs would be identified following the SEZ identification protocol described above. As with the program alternative, the elements of the new Solar Energy Program under the SEZ alternative would be implemented through amendment of the land use plans within the six-state study area.

ES.2.4.4 No Action Alternative

Under the no action alternative, the BLM would continue the issuance of ROW authorizations for utility-scale solar energy development on BLM-administered lands by implementing the requirements of the BLM's existing solar energy policies on a project-by-project basis. The BLM would not implement any of the proposed elements of the Solar Energy Program. Specifically, the programmatic ROW authorization policies, design features, and land use plan amendments proposed in the two action alternatives would not be implemented.

ES.2.4.5 Reasonably Foreseeable Solar Energy Development

A full assessment of the potential impacts of solar energy development on the quality of the human and ecological environment over the next 20 years requires that an estimate be made

of the amount of development that might occur in the six-state study area over that time frame. The amount of power projected to be generated through solar energy development in the six-state study area through 2030 is referred to as the reasonably foreseeable development scenario (RFDS) in this Solar PEIS. The RFDS was calculated on the basis of the requirements for electricity generation from renewable energy resources established in the Renewable Portfolio Standards (RPSs) in each of the six states. To establish an upper bound, it was assumed that 75% of development would occur on BLM-administered lands and that 50% of the RPS-based requirement for renewable energy production would be provided from solar energy. The RFDS that was developed for the Draft Solar PEIS is still considered to be valid to support analyses in this Final Solar PEIS.

On the basis of the RFDS, the estimated amount of solar energy generation on BLM-administered lands in the study area over the 20-year study period is about 24,000 MW, with a corresponding dedicated use of about 214,000 acres (866 km^2) of BLM-administered lands. Table ES.2-4 presents the RFDS for each state in terms of projected megawatts and estimated acres of land required to support that level of development.

ES.2.4.6 Summary of Impacts of BLM's Alternatives

As part of this Final Solar PEIS, the BLM has assessed the potential direct and indirect environmental, social, and economic impacts of solar energy development under the program alternatives. The generally qualitative level of detail of the impact assessment is commensurate with the programmatic decisions to be made, which are primarily planning-level decisions (i.e., allocation and exclusion decisions). The summary of impacts of the alternatives given in Table ES.2-5 is based on the detailed discussion of the affected environment and potential impacts of solar energy development provided in Chapters 4 and 5 of the Draft and Final Solar PEIS.[5] Appendix J also provides a comparison of potential species effects by alternative. The assessment of cumulative impacts at the program level (Section 6.5 of the Draft and Final Solar PEIS) also was considered. The in-depth analyses of potential impacts of development in the proposed SEZs as presented in Chapters 8 through 13 of the Draft and Final Solar PEIS provided an additional basis for the summary of impacts of the SEZ alternative that is provided in Table ES.2-5. The SEZ analyses included an assessment of cumulative impacts, considering ongoing and reasonably foreseeable actions specifically for the vicinity of each SEZ.

The potential impacts of solar development itself are largely similar across the program alternatives. However, because the alternatives represent planning-level decisions (i.e., allocation and exclusion decisions), differences between the alternatives are found in the location, pace, and

[5] The agencies have decided to prepare a condensed Final Solar PEIS (see Section 1.7). Several key chapters of the Draft Solar PEIS have been revised extensively and are presented in full in this Final Solar PEIS (e.g., Chapters 1, 2, 6, and 7). Other sections of this Final Solar PEIS (including Chapters 4 and 5) are presented as updates to the Draft Solar PEIS. The Final Solar PEIS is intended to be used in conjunction with the Draft Solar PEIS, which is being distributed electronically together with the Final PEIS.

TABLE ES.2-4 Reasonably Foreseeable Development Scenario: Projected Megawatts of Solar Power Development by 2030 and Corresponding Developed Acreage Estimates[a]

State	Landholding	Estimated MW under RFDS	Estimated Acres Developed under RFDS[b]
Arizona	BLM	2,424	21,816
	Non-BLM	808	7,272
California	BLM	15,421	138,789
	Non-BLM	5,140	46,260
Colorado	BLM	2,194	19,746
	Non-BLM	731	6,579
Nevada	BLM	1,701	15,309
	Non-BLM	567	5,103
New Mexico	BLM	833	7,497
	Non-BLM	278	2,502
Utah	BLM	1,219	10,971
	Non-BLM	406	3,654
	Total for BLM-administered lands	23,791	214,119
	Total for non-BLM lands	7,930	71,370

[a] See Appendix E of the Draft Solar PEIS for details on the methodologies used to calculate the RFDS.

[b] Acreage calculated assuming land use of 9 acres/MW. To convert acres to km^2, multiply by 0.004047.

concentration of solar energy development. The BLM evaluated each alternative to gauge the extent to which it would (1) meet the stated objectives for the PEIS identified in Section ES.2.1, (2) meet the projected demands for solar energy development as estimated by the RFDS for solar energy development in the six-state study area over the 20-year study period, and (3) support BLM's efforts to meet the mandates established in the Energy Policy Act of 2005 and Secretarial Order 3285A1 (Secretary of the Interior 2010) (Table ES.2-6).

ES.2.4.7 BLM's Preferred Alternative

The BLM has selected the program alternative as the preferred alternative for this Final Solar PEIS. On the basis of the comparisons presented in Table ES.2-6, it appears that the program alternative would best meet BLM's objectives for managing utility-scale solar energy development on BLM-administered lands. It would likely result in the high pace of development

TABLE ES.2-5 Summary-Level Assessment of Potential Environmental Impacts of Utility-Scale Solar Energy Development by Alternative

Resource	Program Alternative (approximately 285,000 acres[b] in priority areas, and approximately 19 million acres subject to variance process)	SEZ Alternative (approximately 285,000 acres in priority areas)	No Action Alternative (approximately 98 million acres available for application)
Lands and Realty	Solar energy development would preclude other land uses within the project footprint and could alter the character of largely rural areas. Development of supporting infrastructure (e.g., new transmission lines and roads) would also locally affect land use. These impacts potentially could be dispersed across the 19 million acres of variance areas; however, impacts would be minimized due to the required variance process. Design features could effectively avoid or minimize many impacts.	Same impacts as program alternative, except impacts would be concentrated into a smaller, known geographic area.	Same impacts as program alternative, except impacts could potentially be more dispersed. There would be no specific design features to reduce impacts.
Specially Designated Areas and Lands with Wilderness Characteristics	Specially designated areas and lands with wilderness characteristics could be significantly affected through direct and indirect impacts (e.g., visual impacts, reduced access, noise impacts, and fugitive dust) during both the construction and operations phases. Similar impacts potentially could be dispersed across the 19 million acres of variance areas; however, impacts would be minimized due to the required variance process. Design features could effectively avoid or minimize many impacts. All NLCS lands would be excluded. Also excluded would be ACECs; SRMAs (except in Nevada and portions of the Yuma East SRMA in Arizona); DWMAs; National Recreation Trails and National Backcountry Byways; National Historic and Scenic Trails; Wild, Scenic, and Recreational Rivers, and segments of rivers determined to be eligible or suitable for Wild and Scenic River status; and lands within the proposed Mojave Trails National Monument. All areas where there is an applicable land use plan decision to protect lands with wilderness characteristics would be excluded.	Same impacts as program alternative, except impacts would be concentrated into a smaller, known geographic area. This concentration of development could increase the magnitude of potential impacts but affect a smaller number of areas.	Same impacts as program alternative, except that only most NLCS lands are excluded from solar energy development and other exclusions do not apply. There would be no specific design features to reduce impacts. Impacts could potentially be more dispersed and greater on specially designated lands and lands with wilderness characteristics due to few exclusions under the no action alternative.

TABLE ES.2-5 (Cont.)

Resource	Program Alternative (approximately 285,000 acres in priority areas) (approximately 19 million acres subject to variance process)	SEZ Alternative (approximately 285,000 acres in priority areas)	No Action Alternative (approximately 98 million acres available for application)
Rangeland Resources	Some livestock grazing allotments may be affected by solar energy development through reductions in acreage and/or loss of AUMs. Wild horses and burros also could be affected, with animals displaced from the development area; the number of wild horse and burro HMAs overlapping with or in the vicinity of lands available for ROW application would be less than under the no action alternative. These impacts potentially could be dispersed across the 19 million acres of variance areas; however, impacts would be minimized due to the required variance process. Design features could effectively avoid or minimize many impacts.	Same impacts as program alternative, except impacts would be concentrated into a smaller geographic area within a known set of grazing allotments and HMAs (there is very little overlap of SEZs with wild horse and burro HMAs).	Same impacts as program alternative, except impacts could potentially be more dispersed, and there is less certainty about which grazing allotments and HMAs potentially could be affected. There would be no specific design features to reduce impacts.
Recreation	Recreational uses would be precluded within lands used for solar energy development. Recreational experiences could be adversely affected in areas proximate to solar energy projects and related transmission. These impacts potentially could be dispersed across the 19 million acres of variance areas; however, impacts would be minimized due to the required variance process. Design features could effectively avoid or minimize many impacts. All SRMAs are excluded from solar energy development (except in Nevada and portions of the Yuma East SRMA in Arizona). Also excluded are developed recreational facilities and special-use permit recreation sites.	Same impacts as program alternative, except impacts would be concentrated into a smaller, known geographic area. This could increase the magnitude of potential impacts but affect fewer recreational resources.	Same impacts as program alternative. There would be no explicit exclusions to avoid SRMAs, recreational facilities, and special-use permit recreation sites. There would be no specific design features to reduce impacts. Impacts could potentially be more dispersed and greater on those recreational areas that would be excluded under the action alternatives.

TABLE ES.2-5 (Cont.)

Resource	Program Alternative (approximately 285,000 acres in priority areas) (approximately 19 million acres subject to variance process)	SEZ Alternative (approximately 285,000 acres in priority areas)	No Action Alternative (approximately 98 million acres available for application)
Military and Civilian Aviation	Military and civilian aviation impacts would be identified and adequately avoided, minimized and/or mitigated prior to the BLM's issuance of a ROW authorization.	Same impacts as program alternative, except impacts would be concentrated into a smaller, known geographic area.	Same impacts as program alternative, except impacts could potentially be more dispersed.
Soil Resources and Geologic Hazards	Development of large tracts of land up to several thousand acres for solar energy facilities and related infrastructure would result in impacts on soil resources in terms of soil compaction and erosion, although these impacts could be effectively avoided, minimized and/or mitigated. Impacts on biological soil crusts would be long term and possibly irreversible. These impacts potentially could be dispersed across the 19 million acres of variance areas; however, impacts would be minimized due to the required variance process. Design features could effectively avoid or minimize many impacts.	Same impacts as program alternative, except impacts would be concentrated into a smaller, known geographic area.	Same impacts as program alternative, except impacts could potentially be more dispersed. There would be no specific design features to reduce impacts.
Mineral Resources	Mineral development within the project footprint for solar energy development would generally be an incompatible use; however, some resources underlying the project area might be developable (e.g., directional drilling for oil and gas or geothermal resources, underground mining). These impacts potentially could be dispersed across the 19 million acres of variance areas; however, impacts would be minimized due to the required variance process.	Same impacts as program alternative, except impacts would be concentrated into a smaller, known geographic area.	Same impacts as program alternative, except impacts could be potentially more dispersed.
	Lands within SEZs may be withdrawn from location and entry under the mining laws.	Lands within SEZs may be withdrawn from location and entry under the mining laws.	No SEZs would be identified or withdrawn.

TABLE ES.2-5 (Cont.)

Resource	Program Alternative (approximately 285,000 acres in priority areas) (approximately 19 million acres subject to variance process)	SEZ Alternative (approximately 285,000 acres in priority areas)	No Action Alternative (approximately 98 million acres available for application)
Water Resources	Solar thermal projects with wet-cooling systems require large volumes of water, with potentially significant environmental impacts. Solar thermal projects with dry-cooling systems need less than one-tenth of the amount of water required for wet-cooling systems. Projects would necessarily be limited to locations with sufficient groundwater supplies where water rights and the approval of water authorities could be obtained. All solar energy facilities require smaller volumes of water for mirror or panel washing and potable water uses, which would result in relatively minor impacts on water supplies. Other potential impacts, including modification of surface and groundwater flow systems, water contamination resulting from chemical leaks or spills, and water quality degradation by runoff or excessive withdrawals, can be effectively avoided, minimized and/or mitigated. Design features could effectively avoid or minimize many impacts.	Same impacts as program alternative, except impacts would be concentrated into a smaller, known geographic area. This could increase the magnitude of potential impacts but affect fewer water resources.	Same impacts as program alternative, except impacts could be potentially more dispersed. There would be no specific design features to reduce impacts.
Vegetation	Solar development will typically require the total removal of vegetation at most facilities, which could result in significant direct impacts in terms of increased risk of invasive species introduction, changes in species composition and distribution, habitat loss (e.g., dune or riparian areas), and damage to biological soil crusts. Indirect impacts also likely in terms of dust deposition, altered drainage patterns, runoff, and sedimentation. Impacts potentially could be dispersed across the 19 million acres of variance areas; however, impacts would be minimized due to the required variance process.	Same impacts as program alternative, except impacts would be concentrated into a smaller, known geographic area. This could increase the magnitude of potential impacts but affect a smaller number of areas.	Same impacts as program alternative. There would be no explicit exclusions to avoid known sensitive vegetation resources and no specific design features to reduce impacts.

TABLE ES.2-5 (Cont.)

Resource	Program Alternative (approximately 285,000 acres in priority areas) (approximately 19 million acres subject to variance process)	SEZ Alternative (approximately 285,000 acres in priority areas)	No Action Alternative (approximately 98 million acres available for application)
Vegetation *(Cont.)*	Design features could effectively avoid or minimize many impacts.		Impacts could potentially be more dispersed and greater on those vegetation resources excluded under the action alternatives.
	Less than 14% each of the Central Basin and Range and Chihuahuan Deserts Ecoregions, and less than 7% each of the Madrean Archipelago, Mojave Basin and Range, and Sonoran Basin and Range Ecoregions are located within the lands that would be available for application. Other ecoregions coincide with these lands at levels below 5%.	Of the five ecoregions that coincide with SEZs, less than 1% of each ecoregion would be available for ROW application.	Lands available for ROW application span 22 ecoregions. More than 50% of 2 ecoregions (Central Basin and Range, Northern Basin and Range) would be available for application.
	The land cover types for the following example species overlap with variance areas available for ROW application by the percentages shown: Joshua tree – less than 7% Saguaro – less than 7%	Less than 1% of the land cover type for Joshua tree and saguaro species is located within the SEZs.	The land cover types for the following example species overlap with the lands that would be available for ROW application by the percentages shown: Joshua tree – about 31% Saguaro – about 26%

TABLE ES.2-5 (Cont.)

Resource	Program Alternative (approximately 285,000 acres in priority areas) (approximately 19 million acres subject to variance process)	SEZ Alternative (approximately 285,000 acres in priority areas)	No Action Alternative (approximately 98 million acres available for application)
Wildlife and Aquatic Biota	Numerous wildlife species would be adversely affected by loss of habitat, disturbance, loss of food and prey species, loss of breeding areas, effects on movement and migration, introduction of new species, habitat fragmentation, and changes in water availability. Impacts potentially could be dispersed across the 19 million acres of variance areas; however, impacts would be minimized due to the required variance process. Design features could effectively avoid or minimize many impacts. Exclusion of ACECs, Research Natural Areas, big game migratory corridors and winter ranges, and lands with seasonal restrictions as identified in applicable land use plans would avoid impacts on wildlife in specific areas The following example species' habitats overlap with variance areas available for ROW application by the percentages shown: Western rattlesnake – less than 6% Golden eagle – less than 6% Black-tailed jackrabbit – less than 6% Pronghorn – less than 5% Mule deer – less than 6% Mountain lion – less than 5%	Same impacts as program alternative, except the potential area of impact would be limited to a smaller, known geographic area. Less than 1% of the habitats for western rattlesnake, golden eagle, black-tailed jackrabbit, pronghorn, mule deer, and mountain lion are located within the SEZs.	Same impacts as program alternative. There would be no explicit exclusions to avoid known sensitive wildlife resources, and no specific design features to reduce impacts. Impacts could potentially be more dispersed and greater on those wildlife resources excluded under the action alternatives. The following example species' habitats overlap with the lands that would be available for ROW application by the percentages shown: Western rattlesnake – about 27% Golden eagle – about 23% Black-tailed jackrabbit – about 24% Pronghorn – about 22% Mule deer – about 22% Mountain lion – about 21%

TABLE ES.2-5 (Cont.)

Resource	Program Alternative (approximately 285,000 acres in priority areas) (approximately 19 million acres subject to variance process)	SEZ Alternative (approximately 285,000 acres in priority areas)	No Action Alternative (approximately 98 million acres available for application)
Special Status Species	Special status species and critical habitats would be protected in accordance with ESA requirements either through avoidance, translocation (plants), or acquisition and protection of compensatory habitat. Impacts potentially could be dispersed across the 19 million acres of variance areas; however, impacts would be minimized due to the required variance process. Design features could effectively avoid or minimize many impacts. Critical habitat designated or proposed by the USFWS would be excluded. All ACECs designated for habitat would be excluded along with identified desert tortoise translocation sites and other areas where the BLM has made a commitment to protect sensitive species (including Mohave ground squirrel and flat-tailed horned lizard habitat in California, greater sage-grouse habitat in California, Nevada, and Utah, and Gunnison's sage-grouse habitat in Utah). Variance areas for ROW application include areas of potentially suitable habitat for special status species (see Appendix J of this Final Solar PEIS). For example, the following species' habitats overlap by the percentages shown:	Special status species and critical habitats would be protected as under program alternative. Lands available for ROW application within SEZs include areas of potentially suitable habitat for special status species (see Appendix J of this Final Solar PEIS).	Special status species and critical habitats would be protected as under program alternative. There would be no specific design features to reduce impacts. In some cases, habitat identified by state fish and game agencies would be excluded, as identified through applicable land use plan decisions. Critical habitat, ACECs designated for habitat value, and other areas where the BLM has made a commitment to protect sensitive species would not be excluded. Lands available for ROW application include areas of potentially suitable habitat for special status species (see Appendix J). For example, the following species' habitats overlap by the percentages shown:

TABLE ES.2-5 (Cont.)

Resource	Program Alternative (approximately 285,000 acres in priority areas) (approximately 19 million acres subject to variance process)	SEZ Alternative (approximately 285,000 acres in priority areas)	No Action Alternative (approximately 98 million acres available for application)
Special Status Species *(Cont.)*	Plants: Nevada dune beardtongue – less than 61% White-margined beardtongue – less than 8% Munz's cholla – less than 16% Animals: Desert tortoise – less than 12% Western burrowing owl – less than 8% Greater sage-grouse – less than 7% Gunnison prairie dog – less than 3% Gunnison sage-grouse – less than 1% Northern aplomado falcon – less than 11% Southwestern willow flycatcher – less than 1% Townsend's big-eared bat – less than 6% Utah prairie dog – less than 11%	For example, about 1% or less of the habitat for two plant species (Nevada dune beard tongue, white-margined beard tongue) and nine animal species (desert tortoise, western burrowing owl, greater sage-grouse, Gunnison prairie dog, Gunnison sage-grouse, northern aplomado falcon, and southwestern willow flycatcher, Townsend's big-eared bat, and Utah prairie dog) are located within the SEZs; less than 4% of Munz's cholla habitat is located within the SEZs.	Plants: Nevada dune beardtongue – 66% White-margined beardtongue – 34% Munz's cholla – 45% Animals: Desert tortoise – 29% Western burrowing owl – 27% Greater sage-grouse – 54% Gunnison prairie dog – 15% Gunnison sage-grouse – 24% Northern aplomado falcon – 26% Southwestern willow flycatcher – 7% Townsend's big-eared bat – 23% Utah prairie dog – 36%

TABLE ES.2-5 (Cont.)

Resource	Program Alternative (approximately 285,000 acres in priority areas) (approximately 19 million acres subject to variance process)	SEZ Alternative (approximately 285,000 acres in priority areas)	No Action Alternative (approximately 98 million acres available for application)
Air Quality and Climate	Air quality would be adversely affected locally and temporarily during construction by fugitive dust and vehicle emissions, although impacts would be relatively minor and could be mitigated (e.g., dust control measures, emissions control devices, and vehicle maintenance). Operations would result in few air quality impacts. Impacts potentially could be dispersed across the 19 million acres of variance areas; however, impacts would be minimized due to the required variance process. Design features could effectively avoid or minimize many impacts. Climate Change: Relatively minor CO_2 emissions would be generated by the use of heavy equipment, vehicles, and backup generators. Overall, CO_2 emissions could be reduced if solar energy production avoids fossil fuel energy production.	Same impacts as program alternative, except impacts would be concentrated into a smaller, known geographic area. This could increase the magnitude of potential impacts, particularly during construction, but affect a smaller number of areas. Climate Change: Same impacts as program alternative, assuming level of development is the same.	Same impacts as program alternative, except impacts could be potentially more dispersed and of smaller magnitude locally. There would be no specific design features to reduce impacts. Climate Change: Same impacts as program alternative, assuming level of development is the same.
Visual Resources	Solar energy projects and associated infrastructure introduce strong contrasts in forms, line, colors, and textures of the existing landscape, which may be perceived as negative visual impacts. Suitable development sites typically located in basin flats surrounded by elevated lands where sensitive viewing locations exist. Impacts potentially could be dispersed across the 19 million acres of variance areas; however, impacts would be minimized due to the required variance process. Various potentially sensitive visual resource areas, including National Historic and Scenic Trails, National Historic and Natural Landmarks, properties designated or eligible for the *National Register of Historic Places*, and areas with important cultural resources that possess historical vistas may be impacted.	Same impacts as program alternative, except the impacts would be concentrated into a smaller, known geographic area. This could increase the magnitude of potential impacts, particularly during construction, but affect a smaller number of areas. SEZs are visible from approximately	Same impacts as program alternative. Some NLCS lands are excluded from solar energy development under the no action alternative. There would be no specific design features to reduce impacts. Impacts could be potentially more dispersed and greater on those areas excluded under the action alternatives.

TABLE ES.2-5 (Cont.)

Resource	Program Alternative (approximately 285,000 acres in priority areas) (approximately 19 million acres subject to variance process)	SEZ Alternative (approximately 285,000 acres in priority areas)	No Action Alternative (approximately 98 million acres available for application)
Visual Resources *(Cont.)*	Design features could effectively avoid or minimize many impacts but some large impacts cannot be avoided. All NLCS lands and ACECs are excluded. All SRMAs are excluded (except in Nevada and portions of the Yuma East SRMA in Arizona). Developed recreational facilities, special-use permit recreation sites, National Recreation Trails, and National Backcountry Byways are excluded. Approximately 995 potentially sensitive visual resource areas (not including ACECs) are located in or within 25 mi[c] of the lands available for ROW viewsheds.	105 potentially sensitive visual resource areas (not including ACECs) within 25 mi.	About 1,473 potentially sensitive visual resource areas (not including ACECs) are located in or within 25 mi of the lands available for ROW application and could be affected by solar development within their viewsheds.
Acoustic Environment	Construction-related noise could adversely affect nearby residents and/or wildlife, and would be greatest for concentrating solar power projects requiring power block construction. Operations-related noise impacts would generally be less significant than construction-related noise impacts but could still be significant for some receptors located near power block or dish engine facilities. Impacts potentially could be dispersed across the 19 million acres of variance areas; however, impacts would be minimized due to the required variance process. Design features could effectively avoid or minimize many impacts.	Same impacts as program alternative, except impacts would be concentrated into a smaller, known geographic area. This could increase the magnitude of potential impacts, particularly during construction, but affect a smaller number of areas.	Same impacts as program alternative, except impacts could be potentially more dispersed. There would be no specific design features to reduce impacts.
Paleonto-logical Resources	Paleontological resources subject to loss during construction, but impacts also possible during operations. Impacts potentially could be dispersed across the 19 million acres of variance areas; however, impacts would be minimized due to the required variance process. Design features could effectively avoid or minimize many impacts.	Same impacts as program alternative, except impacts would be concentrated into a smaller, known geographic area.	Same impacts as program alternative, except impacts could be potentially more dispersed. There would be no specific design features to reduce impacts.

TABLE ES.2-5 (Cont.)

Resource	Program Alternative (approximately 285,000 acres in priority areas) (approximately 19 million acres subject to variance process)	SEZ Alternative (approximately 285,000 acres in priority areas)	No Action Alternative (approximately 98 million acres available for application)
Cultural Resources and Native American Concerns	Cultural resources subject to loss during construction, but impacts also possible during operations. Impacts potentially could be dispersed across the 19 million acres of variance areas; however, impacts would be minimized due to the required variance process. Design features could effectively avoid or minimize many impacts. ACECs designated for cultural or historic resource values, National Historic and Scenic Trails, National Historic and Natural Landmarks, properties designated or eligible for the *National Register of Historic Places*, and areas with important cultural and archaeological resources would be excluded.	Same impacts as program alternative, except impacts would be concentrated into a smaller, known geographic area. Same exclusions as program alternative.	Same impacts as program alternative. There would be no explicit exclusions to avoid known sensitive cultural resources. There would be no specific design features to reduce impacts. Impacts could be potentially more dispersed and greater on those cultural resources excluded under the action alternatives.
Transportation	Local road systems and traffic flow could be adversely affected during construction. Impacts during operations would be minor. Impacts potentially could be dispersed across the 19 million acres of variance areas; however, impacts would be minimized due to the required variance process. Design features could effectively avoid or minimize many impacts.	Same impacts as program alternative, except impacts would be concentrated into a smaller, known geographic area. This could increase the magnitude of potential impacts, particularly during construction, but affect a smaller number of areas.	Same impacts as program alternative, except impacts could be potentially more dispersed. There would be no specific design features to reduce impacts.

Abbreviations: ACEC = Area of Critical Environmental Concern; AUM = animal unit month; BLM = Bureau of Land Management; CO_2 = carbon dioxide; DWMA = Desert Wildlife Management Area; ESA = Endangered Species Act; HMA = herd management area; NLCS = National Landscape Conservation System; ROW = right-of-way; SRMA = Special Recreation Management Area; USFWS = U.S. Fish and Wildlife Service.

Footnotes on next page.

TABLE ES.2-5 (Cont.)

[a] The lands composing the no action alternative have not changed significantly since release of the Draft Solar PEIS; thus, the habitat overlap values (percentages) presented remain valid.

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

[c] The acreage estimates were calculated on the basis of the best available GIS data. GIS data were not available for the entire set of exclusions; therefore, the acreages cannot be quantified at this time.

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

TABLE ES.2-6 Comparison of BLM's Alternatives with Respect to Objectives for the Agency's Action

Objective	Program Alternative	SEZ Alternative	No Action Alternative
Facilitate near-term utility-scale development on public land	Increased pace of development Development in the prioritized SEZs likely to occur at an even faster pace due to detailed analyses of SEZs Reduced costs to the government, developers, and stakeholders Effective in assisting the BLM in meeting its mandates[a]	Increased pace of development likely due to detailed analyses of SEZs Reduced costs to the government, developers, and stakeholders Effective in assisting the BLM in meeting its mandates[a]	No discernible effect on pace of development Development could shift toward nonfederal lands due to delays, making it more difficult for the BLM to achieve its mandates[a]
Minimize potential environmental impacts	Comprehensive program to identify and avoid, mitigate, or minimize potential adverse impacts Protection of resources, resource uses, and special designations through combination of exclusions, variance areas and associated variance process, and mitigation Prioritization of development in SEZs that have been identified as lands well-suited for solar energy development where most potential resource conflicts and appropriate required mitigation have been identified	Comprehensive program to identify and avoid, mitigate, or minimize potential adverse impacts Development limited to the SEZs, protecting more resources, resource uses, and special designations Additional mitigation required in SEZs Limits possibilities for focusing development on previously disturbed lands outside of SEZs; however, this will be given consideration in the identification of new SEZs	Environmental impacts evaluated project-by-project with potential for inconsistencies in the type and degree of required mitigation If development shifts to nonfederal lands, such development would not be subject to the same level of federal environmental oversight and public involvement Potentially would allow a greater degree of development on previously disturbed lands due to 98 million acres of BLM-administered lands being open to application

TABLE ES.2-6 (Cont.)

Objective	Program Alternative	SEZ Alternative	No Action Alternative
Minimize potential environmental impacts (*Cont.*)	Potentially would allow a greater degree of development on previously disturbed lands due to 19 million acres of variance areas being open to application		
Minimize potential social and economic impacts	Economic benefits in terms of (1) direct and indirect jobs and income created and (2) ROW rental payments to the federal government Potential adverse and beneficial social impacts Prioritization of development in the SEZs could concentrate benefits and adverse impacts in a smaller number of local economies	Economic benefits in terms of (1) direct and indirect jobs and income created and (2) ROW rental payments to the federal government Potential adverse and beneficial social impacts With development limited to the SEZs, benefits and adverse impacts would be concentrated in a smaller number of local economies	Potential economic benefits essentially the same as under the action alternatives, although realized at a slower rate if pace of development is slower Potential adverse and beneficial social impacts Less potential for benefits and adverse impacts to be concentrated in specific areas
Provide flexibility to solar industry	A great degree of flexibility in identifying appropriate locations for utility-scale development due to 19 million acres of variance areas being open to application	Limited flexibility in identifying appropriate locations for utility-scale development	Maximum degree of flexibility in identifying appropriate locations for utility-scale development Limited guidance to developers on which lands and projects would ultimately be approvable

TABLE ES.2-6 (Cont.)

Objective	Program Alternative	SEZ Alternative	No Action Alternative
Optimize existing transmission infrastructure and corridors	Greater opportunities for developers to identify and propose projects that utilize existing transmission infrastructure and/or designated corridors due to 19 million acres of variance areas being open to application Opportunities to consolidate infrastructure required for new solar facilities in SEZs	Opportunities for developers to identify and propose projects that utilize existing transmission infrastructure and/or designated corridors limited to SEZs Proximity to existing transmission infrastructure and corridors will be given consideration in the identification of new SEZs Opportunities to consolidate infrastructure required for new solar facilities in SEZs	Maximum opportunities for developers to identify and propose projects that utilize existing transmission infrastructure and/or designated corridors
Standardize and streamline authorization process	Streamlining of project review and approval processes; more consistent management of ROW applications With prioritization of development in the SEZs, additional streamlining of opportunities over development on other available lands	Streamlining of project review and approval processes; more consistent management of ROW applications With development limited to the SEZs, streamlining maximized	No discernible effect in terms of standardizing and streamlining the authorization process

TABLE ES.2-6 (Cont.)

Objective	Program Alternative	SEZ Alternative	No Action Alternative
Meet projected demand for solar energy development as estimated by the RFDS	About 19 million acres[b] open to ROW application, which is more than adequate to support the RFDS projected level of development	About 285,000 acres open to ROW application, which may not be enough land to support the RFDS projected level of development in some states BLM identification of additional SEZs in the future would make additional land available but would require additional environmental review and land use plan amendments	About 98 million acres open to ROW application, which is more than adequate to support the RFDS projected level of development

[a] These mandates are established by the Energy Policy Act of 2005 (P.L. 109-58) and Secretarial Order 3285A1 (Secretary of the Interior 2010) (see Section 1.1 of the Draft Solar PEIS).

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

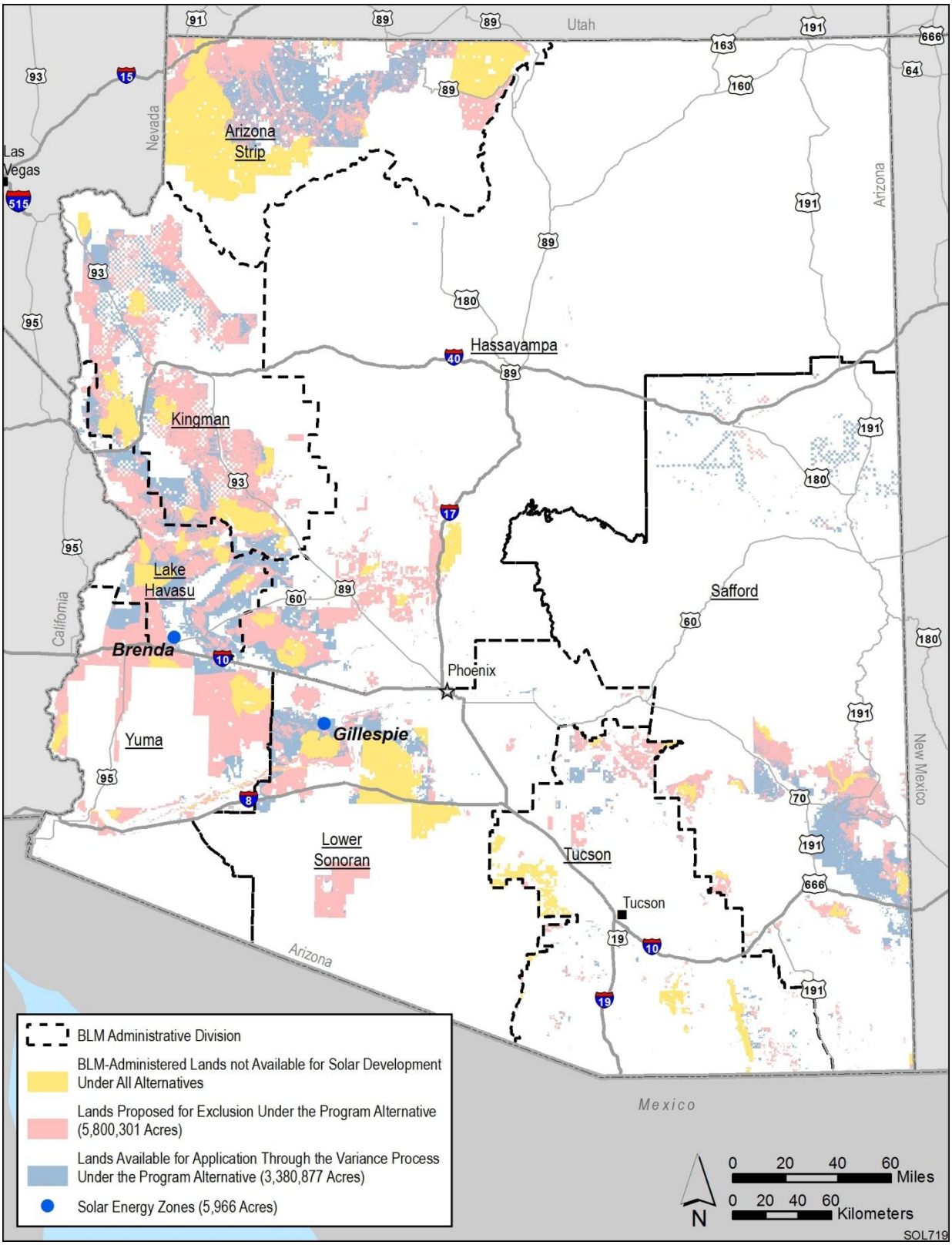

FIGURE ES.2-2 BLM-Administered Lands in Arizona Available for Application for Solar Energy ROW Authorizations under the BLM Alternatives Considered in This PEIS

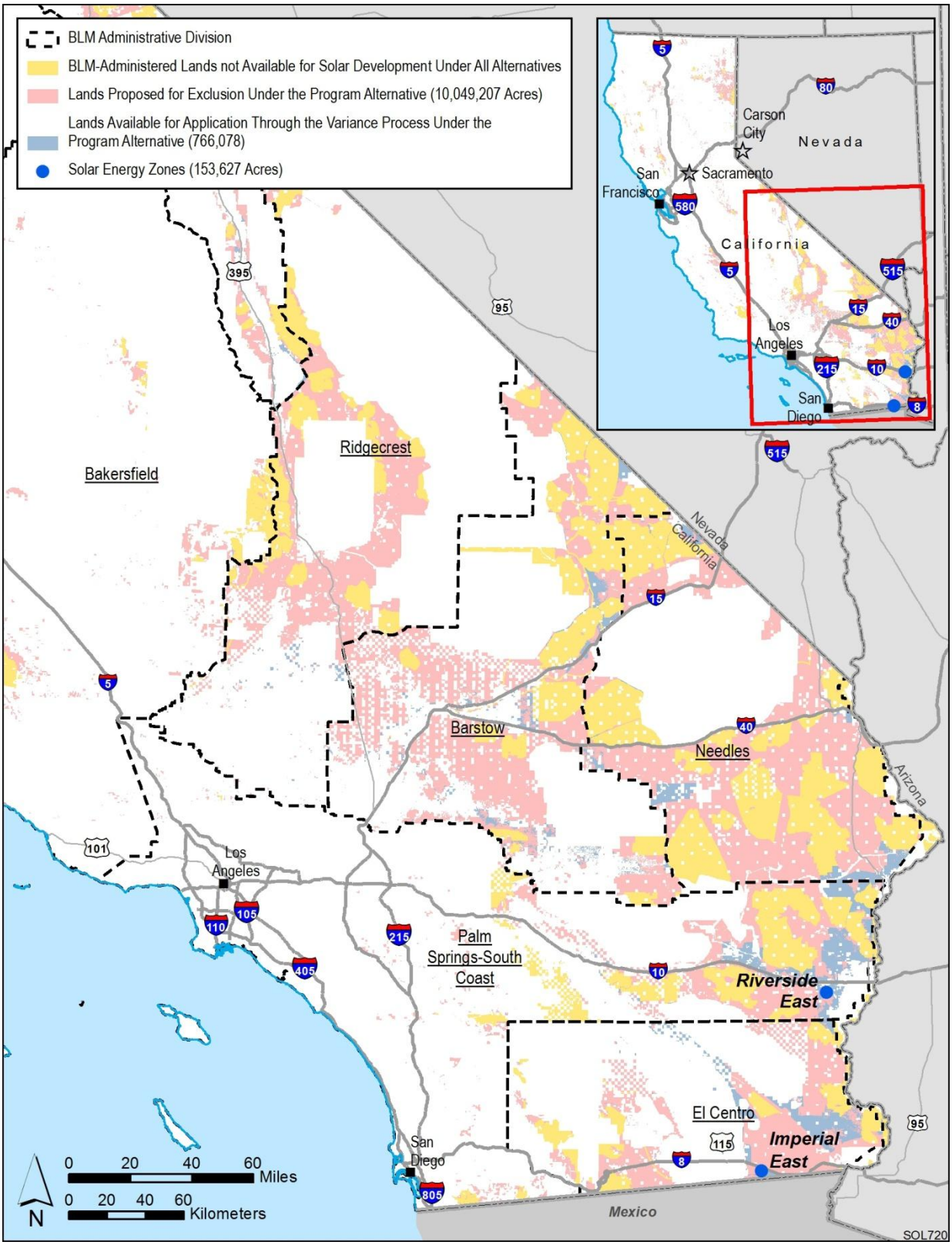

FIGURE ES.2-3 BLM-Administered Lands in California Available for Application for Solar Energy ROW Authorizations under the BLM Alternatives Considered in This PEIS

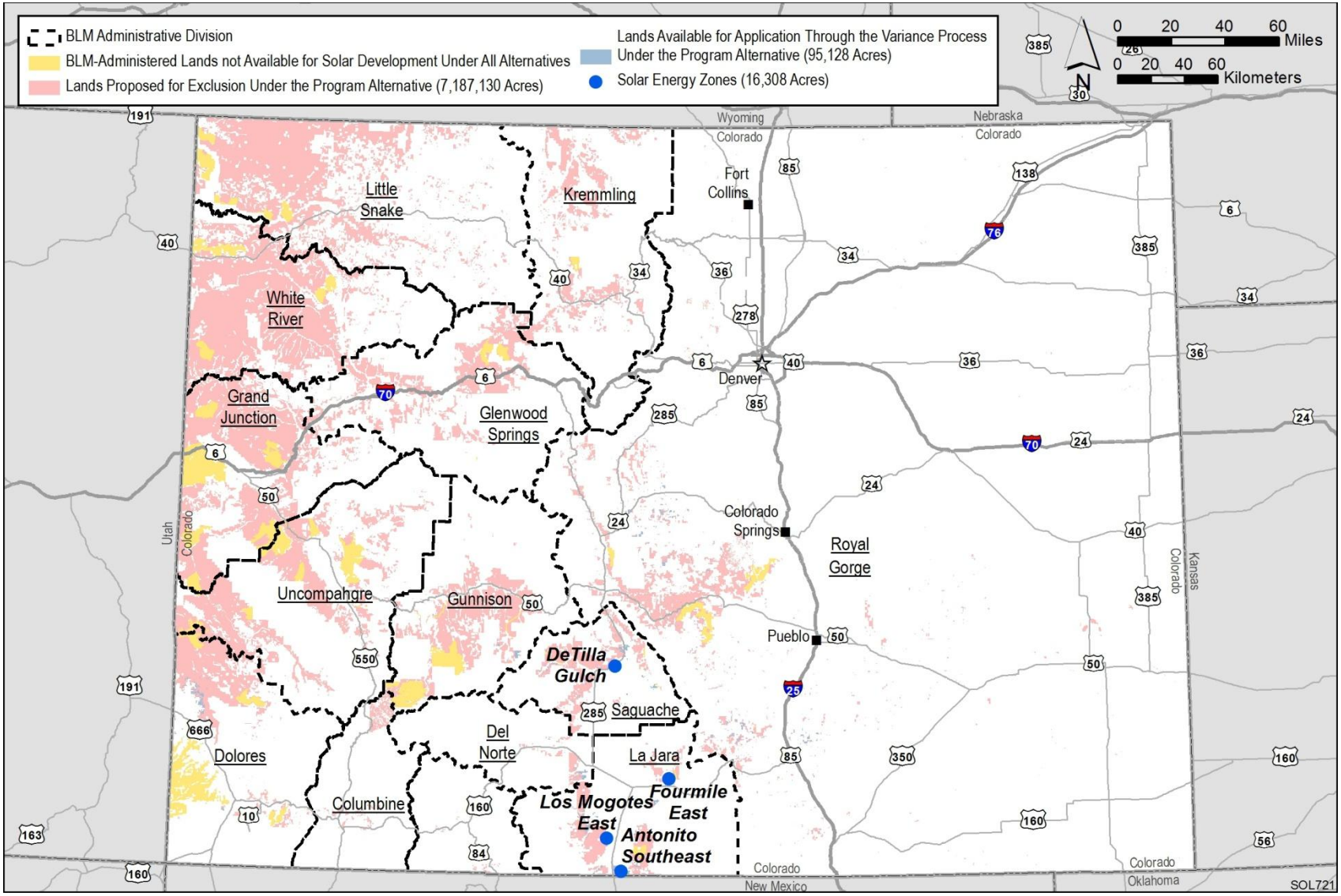

FIGURE ES.2-4 BLM-Administered Lands in Colorado Available for Application for Solar Energy ROW Authorizations under the BLM Alternatives Considered in This PEIS

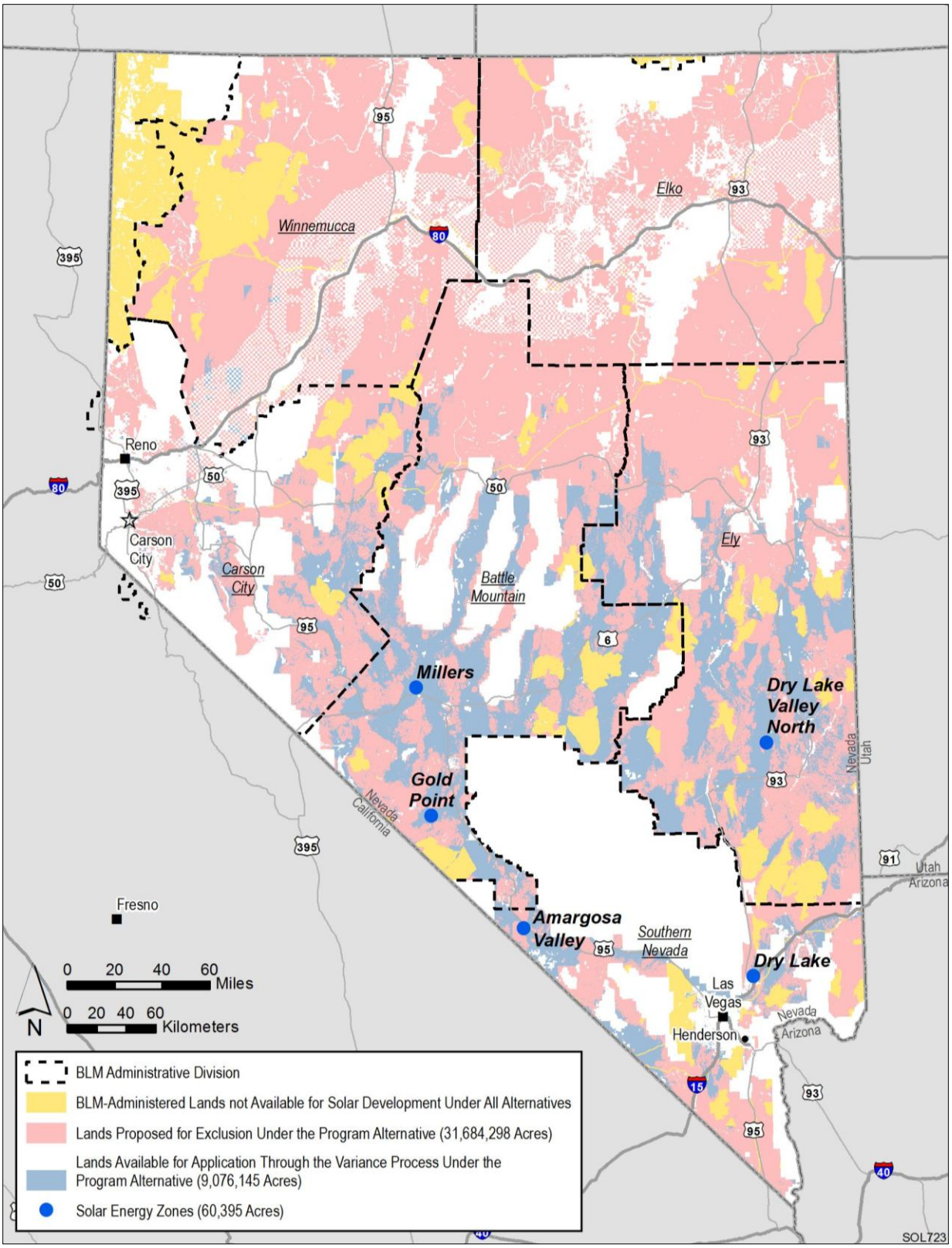

FIGURE ES.2-5 BLM-Administered Lands in Nevada Available for Application for Solar Energy ROW Authorizations under the BLM Alternatives Considered in This PEIS

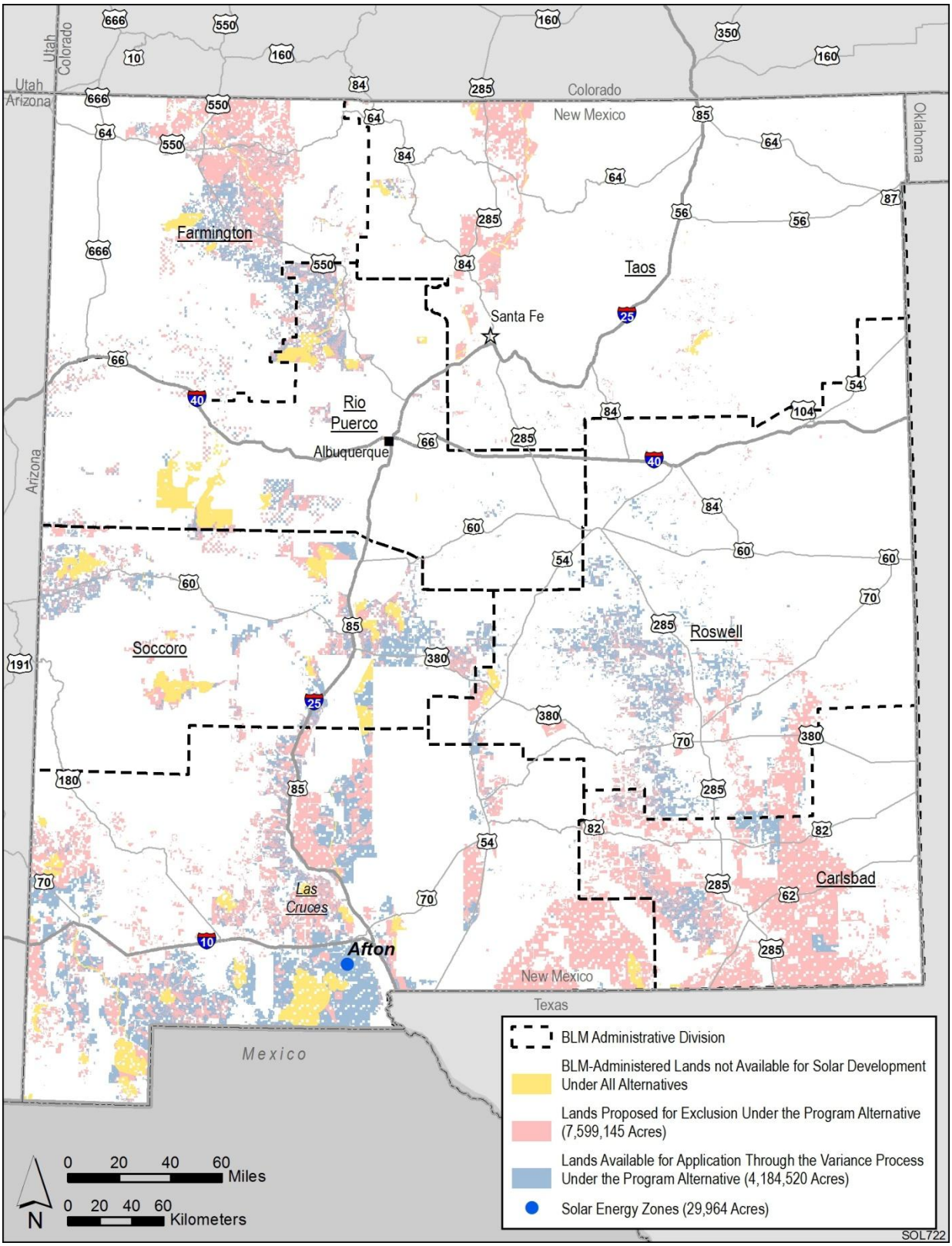

FIGURE ES.2-6 BLM-Administered Lands in New Mexico Available for Application for Solar Energy ROW Authorizations under the BLM Alternatives Considered in This PEIS

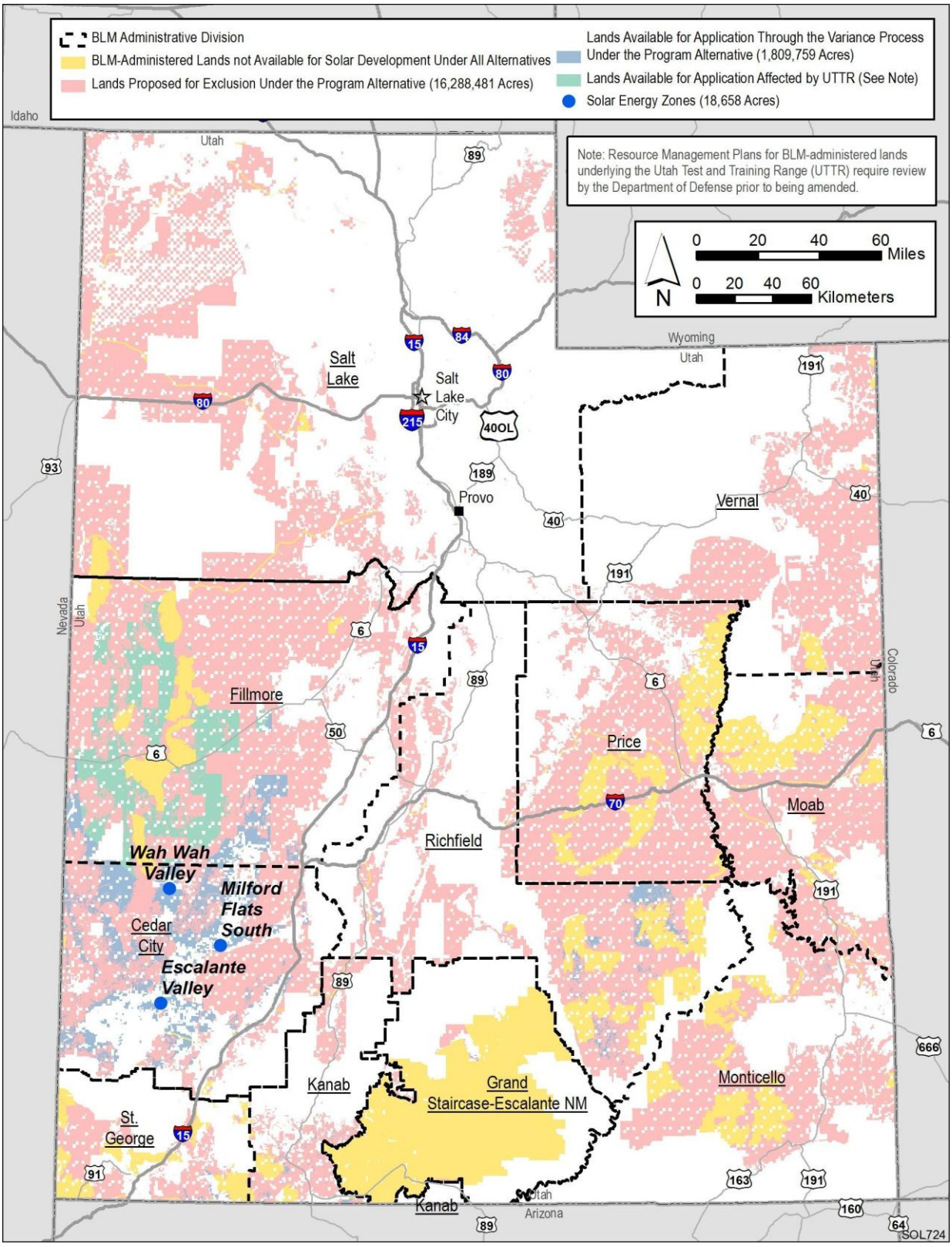

FIGURE ES.2-7 BLM-Administered Lands in Utah Available for Application for Solar Energy ROW Authorizations under the BLM Alternatives Considered in This PEIS

at the low cost to the government, developers, and stakeholders. Simultaneously, it would provide a comprehensive approach for ensuring that potential adverse impacts would be minimized. The expected increased pace of development would accelerate the rate at which the economic benefits would be realized at the local, state, and regional levels. This alternative would make an adequate amount of suitable lands available to support the level of development projected in the RFDS and would provide flexibility in siting both solar energy facilities and associated transmission infrastructure. In addition, the program alternative would be effective at facilitating development on BLM-administered lands in accordance with the mandates of the Energy Policy Act of 2005 and Secretarial Order 3285A1 (Secretary of the Interior 2010).

ES.3 DOE PROPOSED ACTION

As discussed in Chapter 1, different offices within DOE address different aspects and/or approaches to the mission of solar power development. For example, the DOE SunShot Initiative is a collaborative national initiative (including the Office of Energy Efficiency and Renewable Energy [EERE], Advanced Research Projects Agency – Energy [ARPA-E], and the Office of Science) to make solar energy cost competitive with other forms of energy by the end of the decade. One aspect of EERE's mission in support of SunShot is to provide technical assistance and funding for solar technology research and development. EERE's Solar Energy Technologies Program (Solar Program) is working to improve the efficiency and reduce the cost of solar technology through research, development, and demonstration (in partnership with industry, universities, and National Laboratories). The Solar Program also facilitates the deployment of solar technology through resource assessment; development of codes and standards; market and policy analysis; and by providing technical information to national, state, and local entities. DOE is also evaluating its sites around the country for suitability for various renewable energy technologies, including solar. The DOE's National Nuclear Security Administration (NNSA) is evaluating a generic commercial solar power installation in the Nevada National Security Site Site-Wide Environmental Impact Statement (NNSS SWEIS; DOE/EIS-0426), which is scheduled for completion in 2012. In addition, DOE's Loan Guarantee Program is available to provide financial support for the development of qualifying renewable energy projects, including solar energy projects implemented at utility scale.

DOE's Western Area Power Administration (Western) markets and transmits wholesale electrical power through an integrated 17,000-circuit mile, high-voltage transmission system across 15 western states, including parts of the six-state study area for this PEIS. Western's Open Access Transmission Service Tariff provides open access to its transmission system. With respect to new utility-scale solar energy facilities, any interconnection between such a facility and the Western transmission system would need to comply with Western's interconnection policies and environmental requirements and would require NEPA review in accordance with DOE's NEPA regulations.

While solar technologies generally are considered to be clean and sustainable, they can result in adverse direct and indirect impacts on the environment, especially utility-scale facilities. DOE is interested in exploring new ways to generate and store energy captured from the sun, while minimizing the impacts of solar development on the environment and reducing the cost of

solar energy development. DOE is committed to supporting the development of solar and renewable energy projects in an environmentally responsible manner.

Through this PEIS, DOE is considering actions to develop new guidance that will further facilitate utility-scale solar energy development and minimize the associated potential environmental impacts. DOE would consider this guidance, including recommended environmental practices and mitigation measures, in its investment and deployment strategies and decision-making process. This guidance would provide DOE with a tool for making more informed, environmentally sound decisions on DOE-supported solar projects.

ES.3.1 DOE Purpose and Need

As discussed in Chapter 1, DOE is required to take actions to meet mandates under E.O. 13212, E.O. 13514, "Federal Leadership in Environmental, Energy, and Economic Performance" (*Federal Register,* Volume 74, page 52117, Oct. 5, 2009), and Section 603 of the Energy Independence and Security Act of 2007 (EISA) (P.L. 109-58). DOE's purpose and need is to satisfy both E.O.s and comply with congressional mandates to promote, expedite, and advance the production and transmission of environmentally sound energy resources, including renewable energy resources and, in particular, cost-competitive solar energy systems at the utility scale.

Western's purpose and need for participating in this PEIS is to identify potential transmission impacts and recommend mitigation measures for transmission lines associated with solar energy projects. Western anticipates using the transmission environmental impact and mitigation measures analysis in this PEIS to streamline its own NEPA documents once specific projects are identified and interconnection requests are filed with Western. With the PEIS providing the basis for this analysis, project-specific NEPA documentation for interconnections should be more concise and take less time to prepare, resulting in efficiencies for both Western and the project proponent.

ES.3.2 DOE Scope of Analysis

The geographic scope of applicability for DOE's proposed guidance includes both BLM-administered lands and other lands. DOE may support solar projects within SEZs identified by the BLM; on other BLM-administered lands; or on other federal, state, tribal, or private lands. Similarly, Western may be involved in associated transmission development on lands administered by any of these entities.

The scope of the impact analysis includes an assessment of the environmental, social, and economic impacts of utility-scale solar facilities and required transmission connections from these facilities to the existing electricity transmission grid. Viable solar technologies considered likely to be deployed over the next 20 years and assessed in this Solar PEIS include parabolic trough, power tower, dish engine systems, and PV.

ES.3.3 DOE Alternatives

Through this PEIS, DOE is evaluating two alternatives: an action alternative (proposed action) and a no action alternative.

ES.3.3.1 Action Alternative (DOE Preferred Alternative)

The proposed action (action alternative) is DOE's preferred alternative. Under the proposed action (action alternative), DOE would adopt programmatic environmental guidance for use in DOE-supported solar projects. In the Draft Solar PEIS, DOE presented its plans to develop such guidance; the Supplement to the Draft Solar PEIS presented the proposed guidance. The guidance is again described and analyzed in Sections 2.3 and Chapter 7 of this Final Solar PEIS.

DOE has many offices and sites that may fund or implement solar power programs or projects, including 20 National Laboratories and Technology Centers, 4 Power Marketing Administrations, and 10 Operations Offices. As a result, DOE has no single Solar Program analogous to that of the BLM Solar Program. Instead, individual DOE offices and sites would consider any future programmatic guidance in the context of their specific goals and responsibilities. DOE also would consider other factors such as specific congressional funding authorizations and legislated goals. In addition, under either alternative, every proposed DOE project or action would undergo the appropriate level of environmental review under NEPA, and DOE would undertake required consultations under Section 7 of the ESA and Section 106 of the NHPA, and comply with any other legal requirements.

ES.3.3.2 No Action Alternative

Under the no action alternative, DOE would continue its existing process for addressing environmental concerns for solar projects supported by DOE without the benefit of the proposed guidance. It would not adopt programmatic environmental guidance with recommended environmental best management practices and mitigation measures that could be applied to all DOE-supported solar projects.

ES.3.4 Summary of Impacts of DOE's Alternatives

The proposed guidance presented in Section 2.3 is intended to better enable DOE to comprehensively determine where to make technology and resource investments to minimize the environmental impacts of solar technologies for DOE-supported solar projects.

DOE could also consider the proposed guidance in establishing environmental mitigation recommendations to be considered by project proponents. The recommendations contained in the guidance, which are based upon the analysis of impacts of solar energy development and potentially applicable mitigation measures presented in Chapter 5 of the Draft and Final Solar

PEIS, would help DOE ensure that adverse environmental impacts of DOE-supported solar projects would be avoided, minimized, and/or mitigated.

Collectively, streamlined environmental reviews and quicker project approval processes would likely increase the pace of DOE-sponsored development and reduce the costs to industry, regulatory agencies, and stakeholders. These outcomes would support the mandates of E.O.s 13212 and 13514 and Section 603 of EISA.

Increasing the pace of solar energy development would, in turn, translate into other benefits. Utility-scale solar energy development would result in reduced emissions of greenhouse gases (GHGs) and combustion-related pollutants, if the development offsets electricity generation by fossil fuel power plants (see Section 5.11.4 of the Draft and Final Solar PEIS).[6] If the pace of solar energy development is faster as a result of DOE's proposed action, the potential beneficial impacts of reduced GHG emissions would be realized at a faster rate.

Utility-scale solar energy development would result in local and regional economic benefits in terms of both jobs and income created (see Section 5.17.2 of the Draft Solar PEIS). The associated transmission system development and related road construction would also produce new jobs and income. These benefits would occur as both direct impacts, resulting from wages and salaries, procurement of goods and services, and collection of state sales and income taxes, and indirect impacts, resulting from new jobs, income, expenditures, and tax revenues subsequently created as the direct impacts circulate through the economy. Increasing the pace of solar energy development would cause these economic benefits to be realized at a faster pace as well.

As discussed in Section 5.17.1.1 of the Draft Solar PEIS, there may be some adverse socioeconomic impacts resulting from changes in recreation, property values, and environmental amenities (e.g., environmental quality, rural community values, or cultural values), and disruption potentially associated with solar development. There could also be beneficial socioeconomic impacts in these areas resulting from economic growth and a positive reception to the presence of a renewable energy industry. Increasing the pace of solar energy development would also speed up the pace of these types of socioeconomic changes. At the programmatic level, it is difficult to quantify these impacts.

In summary, the proposed programmatic guidance that DOE has developed under its proposed action would likely minimize the potential adverse environmental impacts of solar energy development for DOE-supported projects. As a result of adopting this guidance in various DOE solar-related programs, the pace of solar energy development could increase.

[6] The agencies have decided to prepare a condensed Final Solar PEIS (see Section 1.7). Several key chapters of the Draft Solar PEIS have been revised extensively and are presented in full in this Final Solar PEIS (e.g., Chapters 1, 2, 6, and 7). Other sections of this Final Solar PEIS (including Chapter 5) are presented as updates to the Draft Solar PEIS. The Final Solar PEIS is intended to be used in conjunction with the Draft Solar PEIS, which is being distributed electronically together with the Final PEIS.

Under the no action alternative, DOE would continue its existing process for addressing environmental concerns for DOE-supported solar projects. It would not adopt programmatic environmental guidance to apply to DOE-supported solar projects. As a result, DOE would not undertake specific efforts to programmatically promote the reduction of environmental impacts of solar energy development or streamline environmental reviews for DOE-supported projects. Such achievements, and the potential benefits in terms of increased pace of solar energy development and decreased associated costs, might occur under the no action alternative, but they would not be programmatically promoted by DOE (by adoption of programmatic environmental guidance with recommended environmental practices and mitigation measures).

ES.4 PUBLIC INVOLVEMENT, CONSULTATION, AND COORDINATION

There has been extensive opportunity for public involvement during the preparation of this Solar PEIS. Initially, a Notice of Intent (NOI) to prepare this PEIS was published in Volume 73, page 30908 of the *Federal Register* on May 29, 2008. This notice initiated the first scoping period, which lasted from May 29 to July 15, 2008. During that period, the BLM and DOE invited the public to provide comments on the scope and objectives of the PEIS, including identification of issues and alternatives that should be considered in the PEIS analyses. Public meetings were held at 11 locations across the 6 states. Comments were also collected via the Solar PEIS project Web site (http://solareis.anl.gov) and by mail. A second scoping period was announced through a NOA of Maps and Additional Public Scoping published in the *Federal Register* (Volume 74, page 31307) on June 30, 2009. During this scoping period, the agencies solicited comments about environmental issues, existing resource data, and industry interest with respect to 24 proposed solar energy study areas (later the terminology was changed to solar energy zones, or SEZs). Public comments were collected via the project Web site and by mail. It is estimated that approximately 15,900 individuals, organizations, and government agencies provided comments during the first scoping process and approximately 300 entities provided comments during the second scoping process. The results of the first scoping process were documented in a report issued in December 2008 (DOE and BLM 2008). The comments received during the second scoping process are summarized in Chapter 14 of the Draft Solar PEIS.

After publication of the Draft Solar PEIS in December of 2010, 14 public meetings were held in the six-state study area between January and March 2011. More than 86,000 comments were received. The public, as well as many cooperating agencies and key stakeholders, offered suggestions on how the BLM and DOE could increase the utility of the document, strengthen elements of the proposed Solar Energy Program, and increase certainty regarding solar energy development on BLM-administered lands. These comments were considered in preparation of the Supplement to the Draft Solar PEIS, published in October of 2011. The Agencies held five public meetings in the study area between November 2011 and January 2012 to present the new information provided in the Supplement. During the public comment period on the Supplement to the Draft Solar PEIS, more than 134,000 comments were received.

Comments received on the Solar PEIS documents have largely fallen into several key categories: policy; expressions of support or opposition to the alternatives; environmental,

socioeconomic, and siting concerns; technology; stakeholder involvement; cumulative impact analyses; impact mitigation; coordination with ongoing regional, state, and local planning efforts; and information on resources present in and around the SEZs.

In addition to public scoping, the BLM initiated government-to-government consultation with 316 tribes, chapters, and bands with a potential interest in solar energy development on BLM-administered lands in the six-state study area. The BLM also is coordinating with appropriate agencies in accordance with the requirements of Section 106 of the NHPA and Section 7 of the ESA.

Nineteen federal, state, and local government agencies, identified in Section 1.5, are working with the BLM and DOE as cooperating agencies. As cooperators, these agencies have been involved in the development of the Draft Solar PEIS, the Supplement to the Draft Solar PEIS, and the Final Solar PEIS.

All the documents published by the Agencies in connection with this Solar PEIS (e.g., the Draft and Final Solar PEIS and the Supplement to the Draft; existing applicable BLM policies; and *Federal Register* notices) are available on the Solar PEIS project Web site (http://solareis.anl.gov), along with supporting maps and geospatial data.

ES.5 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 their URL addresses may have changed. The original information has been retained and is available through the Public Information Docket for this Final Solar PEIS.

BLM (Bureau of Land Management), 2005, *Land Use Planning Handbook,* H-1601-1, U.S. Department of the Interior, Bureau of Land Management, Washington, D.C., March.

BLM and DOE (BLM and U.S. Department of Energy), 2010, *Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States*, DES 10-59, DOE/EIS-0403, Dec.

BLM and DOE, 2011, *Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States*, DES 11-49, DOE/EIS-0403D-S, Oct.

DOE and BLM, 2008, *Summary of Public Scoping Comments Received during the Scoping Period for the Solar Energy Development Programmatic Environmental Impact Statement*, Washington, D.C., Oct.

Secretary of the Interior, 2010, "Renewable Energy Development by the Department of the Interior," Amendment No. 1 to Secretarial Order 3285, Feb. 22. Available at http://elips.doi.gov/app_so/act_getfiles.cfm?order_number=3285A1.

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