Renewable Arizona: Restoration Design Energy Project

Record of Decision and Approved Resource Management Plan Amendents

January 2013

BLM

Arizona State Office

MISSION STATEMENT

"To sustain the health, diversity, and productivity of America's public lands for the use and enjoyment of present and future generations."

BLM/AZ/PL-13/002

RECORD OF DECISION
RESTORATION DESIGN ENERGY PROJECT
RESOURCE MANAGEMENT PLAN AMENDMENTS

Lead Agency: U.S. Department of the Interior (DOI), Bureau of Land Management (BLM)

Cooperating Agencies: U.S. Bureau of Reclamation, Western Area Power Administration, Arizona Game and Fish Department, Arizona State Land Department, Arizona Department of Environmental Quality, Arizona Corporation Commission, Central Arizona Water Conservation District, Arizona Department of Water Resources, National Park Service, and Mohave County

Location: Arizona

Contacts: *Requests for additional information regarding the Record of Decision and Approved Resource Management Plan Amendments:*

Kathy Pedrick, Restoration Design Energy Project Manager, 602-417-9235

Requests for copies of the document:

az_arra_rdep@blm.gov or Lane Cowger, 602-417-9612

Project Web site: www.blm.gov/az/st/en/prog/energy/arra_solar.htm

Abstract: The Restoration Design Energy Project (RDEP) is a project of the Bureau of Land Management (BLM) Arizona that supports the Secretary of the Interior's goals to build America's new energy future and to protect and restore treasured landscapes. The BLM Arizona identifies Renewable Energy Development Areas (REDAs) and establishes management actions, design features, and land tenure and reuse policies applicable to solar and wind energy development on BLM-administered lands in Arizona. The REDAs identify where solar and wind energy development is likely to be compatible with resource objectives. The management actions and design features bring consistency and efficiency to the BLM's authorization process. In addition, the BLM has identified a Solar Energy Zone (SEZ) for utility-scale solar development. BLM resource management plans in Arizona are amended to adopt these decisions and measures.

The Record of Decision (ROD) and Approved Resource Management Plan Amendments (Approved RMPAs) describe the U.S. Department of the Interior, Bureau of Land Management's (BLM's), decisions regarding renewable energy development areas on BLM-administered lands in Arizona and approval of these decisions by the BLM Arizona State Director.

This page intentionally left blank.

TABLE OF CONTENTS

Chapter Page

TABLE OF CONTENTS *(continued)*

Chapter Page

FIGURES

TABLES

APPENDICES

ACRONYMS AND ABBREVIATIONS

	Full Phrase
ACEC	Area of Critical Environmental Concern
AGFD	Arizona Game and Fish Department
AIM	Assessment, Inventory, and Monitoring
BMP	best management practice
BLM	Bureau of Land Management
CFR	Code of Federal Regulations
DoD	Department of Defense
DOI	Department of the Interior
EIS	environmental impact statement
EO	Executive Order
FLPMA	Federal Land Policy and Management Act
GIS	geographical information system
kV	kilovolt
NEPA	National Environmental Policy Act
NPS	National Park Service
NOA	Notice of Availability
ROD	Record of Decision
REDA	Renewable Energy Development Area
RFDS	Reasonably Foreseeable Development Scenario
RPS	Renewable Portfolio Standard
RDEP	Restoration Design Energy Project
RMP	resource management plan
RMPA	resource management plan amendment
ROW	right-of-way
SEZ	Solar Energy Zone
SHPO	State Historic Preservation Office
USFWS	US Fish and Wildlife Service
VRM	visual resource management
WPZ	Water Protection Zone



RECORD OF DECISION

TABLE OF CONTENTS

Chapter Page

This page intentionally left blank.

RECORD OF DECISION

1.1 INTRODUCTION

The Bureau of Land Management (BLM) Arizona's Restoration Design Energy Project (RDEP) supports the Secretary of the Interior's goals to build America's new energy future and to protect and restore treasured landscapes. The intent of the RDEP is to identify Renewable Energy Development Areas (REDAs) that include disturbed sites and identify a Solar Energy Zone (SEZ) for Arizona. Examples of disturbed sites include landfills, retired agricultural lands, and abandoned mines and lands with low resource sensitivity and few environmental conflicts.

This Record of Decision (ROD) describes and approves the US Department of the Interior, BLM's decisions to identify REDAs and a SEZ on BLM-administered lands in Arizona. In accordance with the Federal Land Policy and Management Act (FLPMA; Section 103[c]), public lands are to be managed for multiple uses that take into account the long-term needs of future generations for renewable and nonrenewable resources. The Secretary of the Interior is authorized to grant rights-of-way (ROWs) on public lands for systems of generation, transmission, and distribution of electric energy (FLPMA, Section 501[a][4]).

This ROD documents the BLM's decisions, which consist of land use plan amendments that identify REDAs, the Agua Caliente SEZ, and appropriate design features and best management practices (BMPs). The proposed action and alternatives were evaluated through the preparation of the RDEP Final Environmental Impact Statement (EIS; BLM 2012b). The BLM Arizona State Office prepared the EIS in accordance with the National Environmental Policy Act of 1969 (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]); the Department of Interior (DOI) regulations for implementing NEPA (43 CFR Part 46); and applicable BLM authorities (BLM 2008a).

1.2 OVERVIEW OF THE ALTERNATIVES

The RDEP Final EIS evaluated six action alternatives and the No Action Alternative. Alternative development was an iterative process that provided a range of choices supported by reasoned analysis. Public scoping and collaboration with cooperating agencies and stakeholders revealed that renewable energy development would be best suited on lands that are disturbed or that have low resource sensitivity; therefore, the BLM conducted two separate screening processes: one to locate lands with low resource sensitivity and one to locate disturbed lands. Taken together, these lands form the basis for the potential REDAs presented in the different action alternatives.

Lands with low resource sensitivity are areas that are unlikely to contain resources protected by statute or policy, that currently do not have special designations or uses, that are unlikely to contain other recognized values, or for which impacts from development cannot be mitigated. (For example, groundwater is a sensitive resource in many parts of Arizona, but the BLM has the authority to require nonconsumptive technologies to mitigate the impacts of water consumption.) The BLM collected relevant information from BLM datasets, cooperating agencies, stakeholders, universities, and other public sources. The complete listing of these resource datasets is in **Table 2-1**, Areas with Known Sensitive Resources Eliminated from REDA Consideration. The data were loaded into a geographical information system (GIS) and were analyzed to identify low-sensitivity lands that could be suitable for renewable energy development.

REDAs are made up of lands with low resource sensitivity and disturbed sites.

Alternative 1, Maximum REDA, carried forward all potential REDAs for analysis. Using this as a foundation, the BLM looked at the issues identified during scoping to form the themes for four other action alternatives: transmission (Alternative 2), proximity to load centers (Alternative 3), water consumption, (Alternative 4), and land tenure adjustments (Alternative 5). The BLM developed these alternatives by overlaying issue-specific GIS layers (e.g., existing and proposed transmission corridors) on Alternative 1, Maximum REDA. Alternative 6 combined the themes looked at individually in Alternatives 1 through 5 into one overarching alternative titled the Collaborative-Based Alternative.

The RDEP environmental analysis was conducted statewide regardless of land status to facilitate statewide planning and identify areas for possible partnering between the BLM and other federal or state agencies and private landowners. The EIS did not analyze tribal or Department of Defense (DoD) lands unless they were specifically nominated for analysis.

In addition to identifying REDAs, the RDEP served as a step-down process to the BLM's Solar Programmatic Environmental Impact Statement (PEIS) and ROD. This means that RDEP uses the framework established by the Solar PEIS ROD decisions and, in accordance with the Solar PEIS ROD's protocols for

identifying new SEZs, identifies the Agua Caliente SEZ to facilitate the development of utility-scale solar projects.

The proposed SEZ was identified based on a similar screening process for the REDAs in order to address specific needs of utility scale solar development. This process focused on the following criteria: available large contiguous parcels of BLM land (greater than 2,500 acres); proximity to transmission; limited known environmental or cultural constraints; proximity to roads and infrastructure; and preferably near existing development in order to consolidate impacts and minimize fragmentation. About 20,600 acres were originally identified for analysis.

After identifying the proposed Agua Caliente SEZ, the BLM solicited input from the Arizona Game and Fish Department (AGFD), Indian tribes through ongoing consultation, and stakeholder groups for resource information specific to that location. These groups indicated that portions of the SEZ provided quality recreation opportunities, hunting, access to other lands, cultural resources, and wildlife habitat and movement corridors. As a result of this input, the BLM also analyzed two smaller SEZ footprints.

Based on Draft EIS public comments, additional information from AGFD, and new Class II cultural survey data (archaeological sample survey) of the proposed SEZ, the BLM further revised the proposed SEZ boundary in the Final EIS and produced a smaller SEZ area in Alternative 6. The revised boundary included buffers around the major washes; removed the northern portion of the largest SEZ footprint to maintain the area for potential tortoise migration between the Palomas Mountains and Baragan Mountain; and avoided most known archaeological sites and lands with wilderness characteristics not managed to protect those characteristics under the current Yuma Resource Management Plan (RMP; BLM 2010a).

1.2.1 No Action Alternative

Under the No Action Alternative, renewable energy projects would be developed through ROW authorizations and land disposal actions. This would be in accordance with the BLM's existing lands and realty policies, solar or wind development policies, and RMP decisions. Additionally, the BLM would not identify the Agua Caliente SEZ.

1.2.2 Alternative 1, Maximum REDA

This alternative maximized opportunities for siting renewable energy development while avoiding sensitive resources. It provided maximum flexibility for locating small- to large-scale projects without consideration of other physical constraints, such as distance to transmission or load. By eliminating areas with known sensitive resources and incorporating disturbed sites, this alternative identified areas as REDAs that had a low likelihood of resource conflicts. Under Alternative 1, the Agua Caliente SEZ encompassed 20,600 acres.

1.2.3 Alternative 2, Transmission Line and Utility Corridor REDA

This alternative responded to scoping comments that requested that the BLM find renewable energy facility locations close enough to transmission to make it efficient and cost effective to bring the energy online and to deliver it to the market. This alternative sought to reduce environmental impacts by focusing renewable energy development on lands within reasonable proximity to designated utility corridors and existing or certified transmission lines. For this alternative, the BLM started with the Maximum REDA lands (Alternative 1) and then narrowed them further to lands within five miles of an existing or planned transmission line: (1) BLM-designated utility corridors, including the West Wide Energy Corridors; (2) existing transmission lines 230 kilovolts (kVs) or greater; and (3) reasonably foreseeable proposed transmission lines 230 kV or greater. Under Alternative 2, the footprint of the Agua Caliente SEZ was reduced to 6,770 acres.

1.2.4 Alternative 3, Load Offset REDA

Alternative 3 reduced disturbance and environmental impacts by keeping energy generation near the point of demand, such as cities, towns, or industrial centers, while helping Arizona meet its Renewable Portfolio Standard (RPS) commitments. Keeping energy generation near the point of demand offsets urban, rural, and industrial demand by serving both larger and smaller loads; reduces load required from the larger power grid, thereby allowing routing to other locations using existing transmission; provides opportunities for utility-scale and distributed energy; and promotes the development of renewable energy industrial parks near Palo Verde Nuclear Generating Station and the Town of Gila Bend.

The BLM considered only those lands identified under Alternative 1 within a 10-mile area around all incorporated cities in Arizona (ALRIS 2011a), a 5-mile area around the Central Arizona Project ROW and known irrigation sources, a 20-mile area around the Palo Verde Nuclear Generating Station, and a 20-mile area around the Town of Gila Bend. Under Alternative 3, the footprint of the Agua Caliente SEZ was reduced to 2,760 acres.

1.2.5 Alternative 4, Water Conservation and Protection REDA

The Water Conservation and Protection REDA alternative was intended to respond to public concerns about water availability in Arizona, potential effects on other water users, and how renewable energy facilities will impact water resources. It focused on avoiding impacts on sensitive surface watersheds, protecting and maintaining groundwater quality and quantity, and reducing water consumption.

Alternative 4 was developed from the Maximum REDA (Alternative 1). While Alternative 1 addressed some water issues, this alternative went further by proposing water protection zones that provided additional design features to protect water resources in areas with known water supply issues. As part of the

required water resources mitigation and monitoring plan, applicants could include water conservation and replenishment techniques, such as importing water, treating and using brackish water, capturing and using stormwater runoff, allowing water retirement, using recycled or wastewater, and using vegetation treatments, such as removing tamarisk. The proposed Agua Caliente SEZ analysis area was the same size as that described in Alternative 1 (20,600 acres).

1.2.6 Alternative 5, Land Tenure REDA

This alternative met the purpose and need for the RDEP in planning for environmentally sound renewable energy development on public lands in Arizona. It would do this by focusing on lands that were considered suitable for disposal during prior planning processes. These public lands were both within the area identified in Alternative 1 (Maximum REDA) and had been identified as suitable for disposal in existing land use plans. These lands were identified as such for a number of reasons, including low resource values, previous disturbance, and isolation from larger blocks of public land, which has made managing them as public lands difficult. This would be an option for any RDEP alternative, in addition to being considered as a stand-alone option under Alternative 5. The SEZ was not proposed under this alternative.

1.2.7 Alternative 6, Collaborative-Based REDA

While the previous five alternatives each addressed some of the aspects of renewable energy issues and concerns brought forth during scoping, Alternative 6 incorporated all of the concepts, issues, and protections from the other five alternatives. Once the other five alternatives were conceptually developed, the BLM made them available for review by stakeholders, the public, and cooperating agencies. Based on this outreach, the BLM refined the alternatives and developed the Collaborative-Based REDA, which included the following:

- Areas that are more likely to have fewer resource conflicts that may affect development
- Areas close enough to transmission to make it efficient and cost effective to bring the energy online
- Energy generation areas near the point of demand, such as cities, towns, or industrial centers
- Additional resource protection measures
    - Water resource design features for each water protection zone
    - Prioritized available disposal lands for renewable energy purposes and criteria added to favor disposal in a manner that creates additional social and environmental benefits (see Alternative 5).

This alternative combined the transmission areas and load centers data from Alternatives 2 (Transmission REDA) and 3 (Load Offset REDA). Locating areas close to transmission and load centers provided the context for where electricity demand is and where renewable energy projects may be developed in the future.[1] Resource protection elements were added to these lands. Specifically, these were including the water resource protection design features from Alternative 4 to address the water availability concerns; and prioritizing available disposal lands for renewable energy that would favor disposal by creating additional social and environmental benefits (Alternative 5).

Based on public comments, new information provided by a Class II cultural resources survey, and additional information from the AGFD, the BLM developed a revised proposed SEZ boundary to address wildlife habitat and migration, lands with wilderness characteristics, cultural resources, and riparian areas. The revised proposed Agua Caliente SEZ encompassed 2,550 acres.

1.2.8 Environmentally Preferred Alternative

The BLM has determined that all of the action alternatives are environmentally preferred over the No Action Alternative. The impacts of solar and wind energy development itself are largely similar across the action alternatives. Because the action alternatives represent planning-level decisions (i.e., allocation decisions), differences between the alternatives are primarily found in the location of expected solar or wind energy development.

Under all action alternatives, the BLM eliminated categories of resources and lands from renewable energy development. It identified specific locations well suited for solar or wind energy development where the BLM would prioritize development. All action alternatives would also establish design features that would apply to all solar and wind energy projects on BLM-administered lands. These design features represent accepted methods to avoid, minimize, or mitigate potential adverse impacts from solar energy development, including associated facilities, such as transmission lines, roads, and other infrastructure. All of the action alternatives eliminate lands with potential resource conflict, such as sensitive species habitat. However, individual alternatives incorporated one or two specific key issues developed from public input. For example, the Transmission Alternative (Alternative 2) addressed only transmission-related infrastructure locations but did not address sensitive water basins. As such, Alternative 6, the Collaborative-Based REDA, is the BLM's environmentally preferred alternative as it eliminates sensitive resources and lands, addresses all of the key resource issues raised by the public, and includes resource protection measures as design features and BMPs.

[1] REDA parcels contiguous to a parcel within a planned or existing transmission line or load center are also included in the REDA footprint.

1.3 THE DECISION

The decision is hereby made to implement the goals, objectives, management actions, land use allocations, design features, and BMPs identified in Alternative 6: Collaborative-Based REDA to administer the development of renewable energy resources on BLM-administered public lands in Arizona. The decision includes incorporating land use allocations and programmatic and SEZ-specific design features into the following eight Arizona BLM land use plans:

- Arizona Strip Field Office RMP (BLM 2008b)
- Bradshaw-Harquahala RMP (BLM 2010b)
- Kingman Resource Area RMP (BLM 1995)
- Lake Havasu RMP (BLM 2007)
- Lower Sonoran RMP (BLM 2012a)
- Phoenix RMP (BLM 1989)
- Safford RMP (BLM 1991)
- Yuma RMP (BLM 2010a)

The RMP amendments, described in the **Approved Resource Management Plan Amendments**, and **Appendix A**, Renewable Energy Development Areas in Arizona Resource Management Plans, identifies Renewable Energy Development Areas and the Agua Caliente SEZ. The RMP amendments also established required programmatic and SEZ-specific design features for renewable energy development on public lands to ensure the most environmentally responsible development and delivery of solar and wind energy.

1.3.1 What the Decision Provides

This ROD records the decision of the BLM Arizona State Director to establish land use allocations and desired outcomes (goals and objectives) for solar and wind energy development on BLM-administered public lands in Arizona. These allocations and outcomes are established regardless of technology used (e.g., concentrated solar power, photovoltaic, or wind turbine) or scale of development (e.g., utility scale or distributed small scale). This includes the following:

- Identifying REDAs
- Establishing goals, objectives, and management actions for renewable energy development
- Identifying REDA land disposal criteria for future land disposal allocation decisions and disposal actions, including land exchanges and sales
- Identifying terms and conditions, including design features and mitigation measures, to minimize environmental impacts and that

can be used to guide development on any lands available for application for renewable energy (see **Appendix B**, Design Features, Required Plans, and Best Management Practices)

- Establishing goals, objectives, and management actions for land reuse and sustainability practices
- Establishing goals, objectives, and management actions for remediating previously disturbed lands

In conjunction with the national Solar and Wind Program policies and guidance, these decisions will guide the processing of all wind and solar energy applications on BLM-administered lands.

Additionally, the decision provides the following specific actions for the Agua Caliente SEZ and amendments to the Yuma RMP (BLM 2010a):

- Identification of the Agua Caliente SEZ
- Establishment of renewable energy goals, objectives, management actions, and design features for application in the SEZ
- Identification of SEZ-specific design features
- Changes to the visual resource management (VRM) designations in the SEZ from VRM Class III to Class IV
- Removal of the Wildlife Habitat Management Area allocation from within the SEZ
- Removal of the Special Recreation Management Area designation from within the Agua Caliente SEZ

1.3.2 What the Decision Does Not Provide

This ROD does not authorize any solar or wind energy development projects or eliminate the need for site-specific environmental reviews for any future utility-scale, solar energy development project.

The BLM will make separate decisions on whether to authorize individual solar or wind energy projects in conformance with existing land use plans as amended by this ROD. The BLM will complete a site-specific environmental review of all solar or wind energy ROW applications, in accordance with NEPA, prior to issuing a ROW authorization. All future projects will tier to the analysis in the RDEP Final EIS to the extent practicable. The extent of this tiering will vary from project to project, as will the necessary level of NEPA documentation. (Tiering is using the coverage of general matters in broader NEPA documents in subsequent, narrower NEPA documents [40 CFR 1508.28; 40 CFR 1502.20; 43 CFR 46.140].) This allows the tiered NEPA document to concentrate solely on the issues not already addressed.

While the RDEP Final EIS considered the impacts of constructing, operating, and decommissioning the related infrastructure needed to support solar and wind energy development, such as roads, transmission lines, and natural gas or water pipelines, the land use plan decisions being made are applicable only to solar or wind energy generation facilities. Management decisions for supporting infrastructure will continue to be made in accordance with existing land use plan decisions and current applicable policy and procedures.

None of the land use plan decisions or policies described in this ROD are applicable to private lands or other lands outside the BLM's jurisdiction.

The ROD does not amend any land use plan to open areas for solar or wind energy development that existing land use plans have identified as exclusion or avoidance areas.

This ROD and the associated land use plan amendments do not provide guidance or direction for pending applications for solar or wind energy development on BLM-administered lands. Pending applications will not be subject to any decisions adopted by this ROD. The BLM will process pending solar or wind applications consistent with land use plan decisions in place prior to amendment by this ROD and policies and procedures currently in place (e.g., Instruction Memorandum 2011-060 [BLM 2011a] and Instruction Memorandum 2011-061 [BLM 2011b]), or as may be modified in the future.

The decisions in this ROD do not change any regulatory procedures generally applicable to ROWs on BLM-administered lands, including incentives, rental fees, cost recovery fees, and bonding requirements. Additionally, any new utility-scale solar energy ROW applications for lands inside SEZs will be subject to the decisions adopted by the Solar PEIS ROD. The BLM may proceed with pre-application meetings as provided for in the regulations at 43 CFR 2804.10(a), as well as public outreach on new applications in SEZs to assist in developing future competitive lease parcels. The BLM may also consider new applications in SEZs as nominations under the competitive leasing process that the BLM is currently considering through rulemaking. See the Solar PEIS ROD, Appendix B, Section B.1.1, New Applications, for additional information (BLM and DOE 2012c).

1.3.3 Protests on the Proposed Resource Management Plan Amendments

An EIS was prepared for these Approved RMPAs, in compliance with NEPA. The Approved RMPAs are nearly identical to the Proposed RMPAs set forth in the RDEP Final EIS, published in October 2012.

The BLM did not receive any protest letters during the 30-day protest period provided for the proposed land use plan decisions in the Final EIS, in accordance with 43 CFR Part 1610.5-2.

As there were no protests, the BLM has not made significant changes to the Preferred Alternative and Proposed RMPAs, though minor clarifications were made and are explained in the following section.

1.3.4 Clarifications and Modifications

As the result of public comments received on the Final EIS and continued internal review, the BLM makes the following clarifications. Minor grammatical or editorial edits are not included here.

Clarification – The National Park Service requested early notification and cooperation in identifying potential resource conflicts if BLM meets with a proponent interested in development in viewsheds of the Juan Bautista de Anza National Historic Trail. For clarification, for actions permitted by BLM, the BLM will coordinate with the National Park Service on actions that may affect their resources, including any potential effects to the Juan Bautista de Anza National Historic Trail viewshed, as noted under Management Actions in **Section 2.2.1**, Management Decisions. Additionally, as noted in the Nominated Sites discussion in **Section 2.2.2**, Renewable Energy Development Areas, the BLM is not making decisions on non-BLM-administered lands; therefore, areas such as Detrital Wash (State of Arizona land) are not included as REDAs.

Clarification – Comments were received requesting specific fire protection measures. The BLM has numerous resource and public hazard protection measures included in the required design features and plans, and a tool kit of BMPs that will be applied on a site-specific basis. A Fire Management and Protection Plan shall be developed on a project-specific basis to implement measures to minimize the potential for a human-caused fire to affect ecological resources and respond to natural fire situations. See **Appendix B**, Design Features, Required Plans, and Best Management Practices.

1.4 MANAGEMENT CONSIDERATIONS IN SELECTING THE PREFERRED ALTERNATIVE

The BLM has identified Alternative 6, Collaborative-Based REDA as its preferred alternative and land use amendments. The BLM chose this alternative as it provides the best solution to the stated purpose and need by eliminating areas with sensitive resources and lands, addressing all of the key resource issues raised by the public, and including resource protection measures as design features and BMPs. While the other alternatives met the purpose of avoiding sensitive resources, they only represented one or two of the key issues identified by the public. For example, Alternative 4, Water Conservation and Protection REDA, provided additional water resource mitigation measures but did not respond to transmission concerns. Additionally, Alternative 6 represents the collaborative input from cooperating agencies, stakeholders, the public, tribes, and BLM specialists. With selection of Alternative 6, the Collaborative-Based REDA, the BLM is fostering environmentally responsible renewable energy development in a more efficient and standardized way, while

adopting all practicable means to avoid or minimize environmental harm (43 CFR 1505.2(b)).

1.5 CONSISTENCY AND CONSULTATION REVIEW

1.5.1 Governor's Consistency Review

On October 23, 2012, the BLM initiated the 60-day Governor's Consistency Review of the RDEP Final EIS, in accordance with FLPMA (43 USC 1712[c][9]). This states that the Secretary of the Interior shall "coordinate the land use inventory, planning, and management activities of or for such lands with the land use planning and management programs of other Federal departments and agencies and of the States and local governments within which the lands are located." It further directs the Secretary to "assure that consideration is given to those State, local and tribal plans that are germane in the development of land use plans for public lands" and "assist in resolving, to the extent practical, inconsistencies between Federal and non-Federal Government plans." Thus, FLPMA does not require the BLM to adhere to or adopt the plans of other agencies or jurisdictional entities; rather, it requires the BLM to give consideration to those plans and make an effort to resolve inconsistencies to the extent practical. In some circumstances, the BLM may be unable to resolve inconsistencies where state plans conflict with federal law. While state and federal planning processes are required to be as integrated and consistent as practical, the BLM is not bound by or subject to state plans, planning processes, or planning stipulations.

The Arizona Governor's Office did not provide a formal response. Therefore, consistent with the BLM's planning regulations at 43 CFR 1610.3-2(e), the proposed plan amendments are presumed to be consistent with state or local plans, policies, or programs in Arizona.

1.5.2 Cooperating Agencies

Cooperating agencies are state or federal agencies or local or tribal governments that enter into a formal relationship with the BLM to help develop EISs. Each cooperating agency's level of involvement is at its own discretion and can include participating in issue identification, collecting inventory data, contributing to alternative formulation, and estimating effects of alternatives (BLM 2005, page 8). The cooperating agencies on the RDEP are the following:

- Arizona Corporation Commission
- Arizona Department of Environmental Quality
- Arizona Department of Water Resources
- Arizona Game and Fish Department
- Arizona State Land Department
- Bureau of Reclamation

- Central Arizona Water Conservation District
- Mohave County
- National Park Service
- Western Area Power Administration

1.5.3 Tribal Consultation

The federal government works on a government-to-government basis with Native American tribes. This relationship was formally recognized on November 6, 2000, with Executive Order (EO) 13175, Consultation and Coordination with Indian Tribal Governments (65 *Federal Register* 67249). In addition, Section 106 of the National Historic Preservation Act requires federal agencies to consult with Indian tribes for undertakings on tribal lands and for historic properties of significance to the tribes that may be affected by an undertaking (36 CFR 800.2[c][2]). BLM Manual 8120 (BLM 2004a) and BLM Handbook H-8120-1 (BLM 2004b) provide guidance for Native American consultations. The BLM has given substantial consideration to the proper conduct of government-to-government consultations for this project in order to provide for multiple opportunities for tribal consultation. It has provided tribes with multiple ongoing opportunities to comment and receive information on and participate in the RDEP.

EO 13175 stipulates that tribes identified as "directly and substantially affected" be consulted by federal agencies during the NEPA process. The BLM contacted the following 23 tribal governments during the EIS process:

- Ak-Chin Indian Community
- Fort Yuma-Quechan Tribe
- Pascua Yaqui Tribe
- Colorado River Indian Tribes
- Cocopah Indian Tribe
- Yavapai-Prescott Indian Tribe
- Hualapai Tribe
- Hopi Tribe
- White Mountain Apache Tribe
- Havasupai Tribe
- San Carlos Apache Tribe
- Tonto Apache Tribe
- Navajo Nation
- Yavapai-Apache Nation

- Chemehuevi Tribe
- Kaibab Paiute Tribe
- Fort Mojave Tribe
- Pueblo of Zuni
- Gila River Indian Community
- Salt River Pima-Maricopa Indian Community
- Tohono O'odham Nation
- Fort McDowell Yavapai Nation
- San Juan Southern Paiute Tribe

Before and throughout the EIS process, the BLM presented information on the RDEP to tribal officials and representatives in meetings at tribal offices, including the Fort McDowell Yavapai Nation, Gila River Indian Community, Salt River Pima-Maricopa Indian Community, Ak-Chin Indian Community, Kaibab Paiute Tribe, Hualapai Tribe, Hopi Tribe, Intertribal Council, Four Southern Tribes, Tohono O'odham Nation, Quechan Tribe, Pueblo of Zuni, Cocopah Indian Tribe, San Carlos Apache Tribe, White Mountain Apache Tribe, Colorado River Indian Tribes, and Pascua Yaqui Tribe, and hosted a tribal forum at Fort McDowell attended by many of the above listed tribes.

1.5.4 National Historic Preservation Act – Section 106 Consultation

In accordance with the requirements of Section 106 of the NHPA, the BLM coordinated with and solicited input from the Arizona State Historic Preservation Office (SHPO). The BLM and Arizona SHPO followed the coordination protocols in the Arizona Protocol relating to amending resource management plans. In accordance with these procedures, the BLM Arizona corresponded with the Arizona SHPO throughout the development of the EIS to discuss resource issues and alternatives. After reviewing the Draft EIS, the SHPO acknowledged that its questions and concerns had been addressed and that it had no additional questions. For future development within the REDAs and SEZs, the BLM will coordinate and consult with the Arizona SHPO per the Arizona Protocol and requirements under the NHPA. Additionally, for any proposed developments within the Agua Caliente SEZ, the BLM will develop a Regional Mitigation Plan to address resources concerns, including cultural resources, and consult further with SHPO on the mitigation measures (see **Section 1.7**, Mitigation Measures, for additional information regarding Regional Mitigation Plans).

1.5.5 Endangered Species Act – Section 7 Consultation

Having reviewed RDEP as a whole, including allocation of REDAs and the Agua Caliente SEZ, the USFWS replied on December 12, 2012, with their Final Conference Report and Concurrence, which included their rationale for concurrence. The Conference Report and Concurrence included a

determination that the designation of the Agua Caliente SEZ would not jeopardize the continued existence of the reintroduced experimental population of Sonoran pronghorn in southwestern Arizona. The USFWS also proposed several conservation recommendations for the BLM to consider in future land use planning and the processing of renewable energy development applications. Finally, the USFWS concurred with BLM's determination that the designation of the Agua Caliente SEZ through the RDEP "may affect, but is not likely to adversely affect" the endangered lesser long-nosed bat. Their conservation recommendations have been included in the RDEP management actions.

The USFWS made the following four recommendations to the BLM for RDEP and allocations of the REDAs; the BLM should:

- Periodically consider the need to exclude additional areas currently within SEZs or REDAs from renewable energy development if potential adverse effects to listed species are identified;
- Coordinate with USFWS in formulating any mitigation required by design features for special status species;
- Monitor the implementation of mitigation measures at renewable energy development projects and periodically assess the effectiveness of those measures in order that measures recommended at new projects are improved through learning in an adaptive management context; and,
- Monitor the status of listing of additional species in Arizona.

These four recommendations for REDAs are already part of the management decisions in the RDEP ROD.

The USFWS also offered the following conservation recommendations for Sonoran pronghorn in the project area; the BLM should:

- Report sightings of Sonoran pronghorn or sign on or in the vicinity of the Agua Caliente SEZ to the USFWS and Arizona Game and Fish Department. Documentation of sightings of animals, tracks, droppings, and hair, through digital or other photography, to the extent practical, is recommended.
- Lay out of fencing around renewable energy facilities avoid creating "dead end" or "trap" areas between fenced areas to allow easy egress for Sonoran pronghorn from the area if startled by humans or predators. The USFWS also recommended designing fencing to avoid ensnarling pronghorn and other large mammals.
- Include briefing materials on Sonoran pronghorn in Worker Education and Awareness Programs for construction workers at renewable energy facility sites within the Agua Caliente SEZ,

including identification and the importance of avoiding disturbing any animals encountered. The USFWS also recommended that the BLM work with them and the Arizona Game and Fish Department in development of Worker Education and Awareness Programs material for Sonoran pronghorn.

- Keep work areas clean, including eliminating edible garbage and prohibiting the feeding of animals.

These additional SEZ-specific recommendations for Sonoran pronghorn were included in **Section 2.2.3**, Additional Amendments to the Yuma Resource Management Plan for the Agua Caliente Solar Energy Zone.

Regarding the lesser long-nosed bat, the USFWS concurred with the BLM's finding that the proposed action "may affect, but is not likely to adversely affect" the species, as there are no known lesser long-nosed bat roosts in the area of the Agua Caliente SEZ (the nearest known lesser long-nosed bat roost area is 55 miles from the SEZ). The USFWS agreed that while there may some adverse effects from possible development on the SEZ due to a reduction in bat foraging habitat, these effects will be extremely unlikely and discountable because the Agua Caliente SEZ is outside of the typical foraging distance for lesser long-nosed bats.

1.5.6 Additional Agency Coordination

The BLM Arizona has coordinated with the following additional agencies:

- Department of the Interior
  - Bureau of Indian Affairs
  - US Fish and Wildlife Service
  - National Park Service
- Arizona BLM Resource Advisory Committee
- Department of Defense military installations in Arizona
- US Forest Service
- State agencies
  - Governor's Office
  - Arizona State University
  - Arizona Geological Survey
- Other counties and municipalities

1.6 PUBLIC INVOLVEMENT

1.6.1 Scoping

Public involvement, which includes public scoping and comments on the Draft EIS, is required under NEPA CEQ regulations 40 CFR 1500-1508, DOI NEPA regulations 43 CFR 46, and FLPMA and its implementing regulations, including 43 CFR 1610.2 and 1610.4-1, which provide additional guidance and direction for public involvement.

Throughout the RDEP, the BLM engaged multiple cooperating agencies, tribes, stakeholders, and the general public for a broad understanding on the desired future renewable energy footprint on federal, tribal, state, and private lands in Arizona.

The RDEP outreach started with scoping and publication of the Notice of Intent on January 13, 2010 (75 *Federal Register* 1807; the scoping report is available online at http://www.blm.gov/az/st/en/prog/energy/arra_solar.html). The BLM sought identification of site locations of previously disturbed or utilized lands, in addition to identification of issues that might be associated with the RDEP. Local, state, and federal agencies, private companies, and members of the public nominated 42 potential sites. The BLM continued to receive nominations through its website, individual letters, and scoping meetings, during which local governments, tribes, businesses, and members of the public identified an additional 22 sites for consideration.

The BLM provided information on the RDEP project and sought additional information and data to support alternatives development and analysis from groups that have invited the BLM to share information and address public forums regarding the RDEP. The BLM met with these stakeholder groups to identify any additional opportunities for or constraints on the project. The groups included Arizona state agencies, military installations, Arizona utilities, and environmental organizations. A full listing of the groups and agencies consulted was documented in Chapter 6, Consultation and Coordination, of the Final EIS.

1.6.2 Public Comments on the Draft Environmental Impact Statement

The BLM published the Notice of Availability (NOA) for the RDEP Draft EIS for public review and comment in the *Federal Register* on February 17, 2012 (77 *Federal Register* 9694). The BLM distributed the Draft EIS to individuals, agencies, and organizations on the RDEP mailing list and to all cooperating agencies and tribes for a 90-day public comment period. Five public meetings were held in early March and April to provide an opportunity to comment on the RDEP EIS. During these meetings, 121 people registered their attendance. These public meetings were structured in an open house format, with BLM specialists available to provide information on the Draft EIS in general, on the alternatives, analysis, specific resources of concern, and on the planning process.

At the public meetings and on the RDEP website, the public was also provided with information on how to submit comments on the Draft EIS. The BLM received submissions from approximately 3,398 individuals by mail and e-mail, and submitted orally and in writing at the public meetings. Of the total individuals who sent letters, approximately 3,327 of them were associated with form letters, and approximately 71 were considered to be associated with unique submissions. Most written submissions included more than one comment, so the 71 unique submissions yielded 362 discrete comments.

Comments covered a wide spectrum of thoughts, opinions, ideas, and concerns. The BLM recognizes that commenters invested considerable time and effort to submit comments on the Draft EIS; for this reason, the BLM developed a comment analysis method to ensure that all comments were considered, as directed by NEPA regulations (described in **Appendix G**, Response to Comments on the Draft EIS, in the Final EIS).

Based on the initial issue categories, further review of the comments revealed a majority of comments were related to the stated purpose and need and elements of the alternatives (56 percent of the total comments), followed by a much lower percentage of comments on the impact analysis (17 percent of the total comments), elements of the proposed Agua Caliente SEZ (10 percent), nominated sites (8 percent), and GIS analysis (3 percent).

1.6.3 Release of and Public Comments on the Final Environmental Impact Statement

The NOA for the RDEP Final EIS was published in Volume 77, page 66183 of the *Federal Register* on November 2, 2012. While publication of the NOA of a Final EIS does not trigger a formal public comment period, the BLM reviewed all comments submitted following the publication of the RDEP Final EIS and used them to make clarifications and modifications in this ROD.

The BLM received four comment letters on the RDEP Final EIS from members of the public, the National Park Service, and the Environmental Protection Agency. The BLM reviewed all comments received and made clarifications and modifications in this ROD as appropriate (see **Section 1.3.4**, Clarifications and Modifications). No protests were received on the RDEP Final EIS.

1.6.4 Availability of the Record of Decision

Copies of the ROD and the Approved RMPAs may be obtained by viewing or downloading the document from the BLM website at http://www.blm.gov/az/st/en/prog/energy/arra_solar.html or by obtaining a hard copy or CD from the BLM Arizona State Office, at One North Central Avenue, Suite 800, Phoenix, Arizona 85004-4427.

1.7 MITIGATION MEASURES

The RDEP mitigates potential adverse impacts by avoiding, minimizing, and offsetting unavoidable impacts. Avoidance will be achieved through siting decisions within the REDAs and Agua Caliente SEZ. Minimization will be achieved by programmatic and SEZ-specific design features (see **Appendix B**, Design Features, Required Plans, and Best Management Practices). Design features are mitigation requirements that have been incorporated into the proposed action to avoid or minimize adverse impacts. The design features were derived from comprehensive reviews of solar energy development activities; published data regarding solar energy development impacts; existing, relevant mitigation guidance; standard industry practices; and the Solar Program ROD and Wind Program ROD. Adherence to the design features included in this ROD will be required for all future solar and wind energy development on BLM-administered lands in Arizona.

All solar and wind energy development on BLM-administered lands will also adhere to applicable federal, state, and local laws and regulations, such as the Endangered Species Act, that seek to avoid or minimize adverse impacts. For those impacts that cannot be avoided or minimized, the BLM will determine, in consultation with affected stakeholders, whether measures to offset or mitigate adverse impacts would be appropriate.

1.7.1 Regional Mitigation Plans

The National BLM Solar Program has established a requirement for regional mitigation plans for all SEZs; the regional mitigation plans are larger monitoring and adaptive management strategies to ensure that data and lessons learned about the impacts of solar energy projects will be collected, reviewed, and, as appropriate, incorporated into the BLM's Solar Energy Program in the future (BLM and DOE 2012c, page 167). This long-term solar monitoring and adaptive management plan will be based on the 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.

As envisioned, regional mitigation plans will simplify and improve the mitigation process for projects in SEZs. The BLM has started a pilot effort for regional mitigation planning in California and Nevada; results of the pilot will be used by the Arizona BLM to develop regional mitigation plans for the three SEZs in Arizona, including the Agua Caliente SEZ allocated in this ROD.

1.8 MONITORING AND ADAPTIVE MANAGEMENT

Required design features and any additional mitigation measures will be identified in ROW authorizations for individual projects. These measures will be monitored by project developers and the BLM to ensure their continued effectiveness through all phases of development. In cases where monitoring

indicates that mitigation measures are ineffective at meeting the desired resource conditions, the BLM will take steps to determine the cause and will take corrective action using adaptive management strategies. This information will also be used to inform the authorization of future renewable energy development on BLM-administered lands.

1.8.1 Plan Maintenance and Data Refinement

Land use plan decisions and supporting information associated with the approved RMPAs will be maintained to reflect minor changes in data. Maintenance is limited to refining, documenting, or clarifying these land use plan amendments, as provided in 43 CFR 1610.5-4. Plan maintenance will be documented in supporting records; it does not require formal public involvement, interagency coordination, or preparation of an environmental assessment or EIS.

The available GIS data and maps used for the analysis in the RDEP Final EIS are available at the project website (http://www.blm.gov/az/st/en/prog/energy/arra_solar.html). Data used in developing the Approved RMPAs were the best available data at that time. Data are also dynamic, and, in some cases, GIS data were unavailable for some planning areas and resources although new data may become available in the future. Thus, all acreages presented in the **Approved Resource Management Plan Amendments**, and **Appendix A**, Renewable Energy Development Areas in Arizona Resource Management Plans, are estimations. The data and maps used throughout the RDEP Final EIS are for land use plan amendment purposes only and will be verified or refined (or both) by site-specific information, as necessary. Updating data is considered plan maintenance and is expected to occur over time as the land use amendment decisions are implemented.

1.8.2 Future Amendments

Should conditions warrant, any planning decision, including those made in this ROD, may be changed through a plan amendment process. This may become necessary if changes in circumstances or actions come under consideration that may result in a change in the scope of resource uses or a change in the terms, conditions, or decisions of the approved plan (e.g., significant new information is available or a proposal or action comes under consideration that is not in conformance with the plan). The results of monitoring, evaluation of new data, or policy changes and changing public needs might also provide the impetus for an amendment. Generally, an amendment is issue specific, but a programmatic amendment process is also possible. Plan amendments are accomplished with public input and the appropriate level of environmental analysis and NEPA compliance.

1.8.3 Identifying New or Expanded Solar Energy Zones

As outlined in the Solar ROD, the BLM will identify new or expanded SEZs 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 (BLM and DOE 2012c). The Arizona BLM intends to assess the need for new or expanded SEZs at least once every five years. The process to identify new or expanded SEZs will be open and transparent, with opportunities for substantial involvement of multiple stakeholders, and follow the steps outlined in the Solar ROD (BLM and DOE 2012c, page 168).

The process for identifying new or expanded SEZs includes looking for areas that meet technical and economic suitability criteria, occur in areas of low resource conflict or on degraded, disturbed, or previously disturbed sites, and take into account opportunities to partner with adjacent federal and nonfederal landowners. The RDEP has used all of these criteria to identify REDA lands; as such, new or expanded SEZ areas will likely be identified on REDA lands. Using the RDEP analysis from the Final EIS will also provide streamlined planning and NEPA analysis processes.

1.9 FINAL AGENCY ACTION AND APPROVAL OF THE RESOURCE MANAGEMENT PLAN AMENDMENTS

It is the decision of the Arizona Bureau of Land Management to approve the Resource Management Plan amendments to the eight Arizona Resource Management Plans identified in the Record of Decision. The Proposed Resource Management Plan Amendments and related Final Environmental Impact Statement were published on November 2, 2012, in the *Federal Register* (77 *Federal Register* 66183). This approval is effective on the date this Record of Decision is signed.

Approved:

Raymond Suazo
Arizona State Director

January 18, 2013
Date

This page intentionally left blank.



APPROVED RESOURCE MANAGEMENT PLAN AMENDMENTS

TABLE OF CONTENTS

Chapter Page

FIGURES

Page

TABLES

Page

This page intentionally left blank.

APPROVED RESOURCE MANAGEMENT PLAN AMENDMENTS

2.1 INTRODUCTION

2.1.1 Purpose and Need

There is a growing demand for energy in the western United States. This, combined with applicable laws, orders, and policies, encourages the DOI and the BLM to facilitate renewable energy siting and production. It has created a need for the BLM Arizona to consider updating and amending existing land use plans. Siting renewable energy projects is complex and multifaceted, requiring the consideration of many variables, including topography, distance to transmission and load, landownership patterns and availability, tribal concerns, and environmental and cultural resource constraints. Current land use plans generally do not consistently address these factors or provide guidance on where development should occur. Under current plans, applications typically have lengthy processing times as the BLM evaluates the project location, conducts environmental and cultural reviews, develops appropriate mitigation measures, collaborates with stakeholders, and, in some cases, prepares a land use plan amendment.

The purpose of the RDEP is to conduct smart, statewide planning to foster environmentally responsible production of renewable energy and to allow the permitting of future renewable energy development projects to proceed in a more efficient and standardized manner. The RDEP ROD amends land use plans to identify geographic areas best suited for renewable energy, to establish land reuse goals, and to identify design features to protect resource values and uses.

While the RDEP furthers the BLM's ability to meet the mandates of EO 13212, Actions to Expedite Energy-Related Projects (66 *Federal Register* 28357) and the Energy Policy Action of 2005, it also has been designed to meet the

requirements of Secretarial Order 3285A1 to identify areas best suited for renewable energy (Secretary of the Interior 2010).

2.1.2 Decision Area Description

Arizona has a wealth of renewable energy resources, especially for those technologies that rely on solar radiation and wind (Black and Veatch 2007). The BLM manages over 12 million surface acres of public lands in Arizona. Wind and solar projects on public lands are administered through BLM ROW grants, in accordance with land use plans.

The BLM Arizona manages large acreages of diverse public lands across the state, with topography ranging from low deserts to high mountains. The land uses are as varied as the terrain and include livestock grazing; fish and wildlife habitat; oil, gas, and mineral exploration and development; ROW authorizations; and a wide range of outdoor recreation activities. These uses are managed within a framework of numerous public land laws, the most comprehensive of which is FLPMA.

2.1.3 Key Planning Issues

The following list encapsulates the specific issues and questions raised by the public and the BLM during the scoping process:

1. Stakeholders and Collaboration—How will the BLM work with stakeholders across the state to leverage local knowledge, secure data sources, and consider local needs?
2. Site Criteria—What criteria will be applied to the nominated sites to determine suitability for inclusion in the alternatives, for example, proximity to population and energy development potential?
3. Transmission Lines—How will the BLM consider the need for new transmission lines or proximity to existing transmission lines in site selection and alternatives development?
4. Balancing Development—How will the BLM balance the development of renewable energy sites across the landscape?
5. Technology and Infrastructure—How can the BLM accommodate a diversity of technologies, existing infrastructure, and different scales of development?
6. Land Tenure Adjustments—Can BLM exchange or sell disposal parcels in order to benefit local economies and create development incentives?
7. Streamlining Future Analysis—How can this EIS streamline the process for permitting and performing site-specific environmental analyses for sites identified in the future?

8. Remediation—How will the BLM address the need for site-specific remediation?
9. Effects on Resources and Resource Uses—How will the BLM reduce the impacts of renewable energy development on resources and resource uses, including air, water, wildlife, wildlife habitat, wilderness, soils, cultural and paleontological resources, visual resources, and recreation?
10. Socioeconomics and Environmental Justice—How can the BLM implement the project in a way that strengthens state and local socioeconomic conditions, provides local access to energy, ensures environmental justice, and protects human health and safety?
11. Cumulative Impacts—How will the BLM address the cumulative impacts of renewable energy development and its associated infrastructure on a landscape scale?

2.1.4 Planning Criteria

In accordance with BLM planning regulations (43 CFR 1610.4-2), planning criteria were developed to help guide data collection, alternative formulation, and impact analysis. Criteria, such as those that follow, are generally based on laws, regulations, and agency guidance and serve to keep the planning process focused.

- The EIS and land use plan amendments will be completed in compliance with FLPMA, the Endangered Species Act, the Clean Water Act, the Clean Air Act, NEPA, and all applicable laws, EOs, and management policies of the BLM.
- The Reasonably Foreseeable Development Scenario for renewable energy development within Arizona provides background on other similar assessments done in Arizona, an overview of wind and solar technologies assumed to be used, the method used for preparing the RFDS, the results of the analysis, and conclusions. The RFDS will be used as baseline and to provide context for the analysis.
- Unless specifically amended by the ROD for this EIS, the BLM will continue to manage resources and uses by existing land use planning decisions.
- The RMPs, as amended, will recognize valid existing rights.
- The BLM will coordinate with local, state, tribal, and federal agencies during the EIS process to strive for consistency with existing plans and policies, to the extent practicable.
- The BLM will coordinate with tribal governments and will provide strategies to protect recognized traditional uses in the EIS process.

- The BLM will take into account appropriate protection and management of special status plant and animal species in the EIS and will engage in all required consultation.
- The BLM will take into account appropriate protection and management of cultural and historic resources in the EIS and will engage in all required consultation.
- The BLM will recognize in the EIS the specific niche occupied by public lands in the life of the communities that surround them or that are surrounded by them and in the nation as a whole.
- The BLM will encourage public participation throughout the process.
- Environmental protection and energy production are both desirable and necessary objectives of sound land management practices and are not to be considered mutually exclusive priorities.
- The BLM will support planning to provide renewable energy opportunities to help meet public consumptive uses that contribute to climate change.
- Geospatial data will be automated within a geographic information system to facilitate discussions of the affected environment, formulation of alternatives, analysis of environmental consequences, and display of results.

2.1.5 Planning Process

The RDEP EIS and Planning Amendments were initiated under the authority of Section 202(f) of FLPMA and guided by BLM planning regulations in 43 CFR 1600. Additionally, the EIS is subject to Section 202(c) of NEPA and guided by the Council on Environmental Quality (CEQ) regulations in 40 CFR 1500 and DOI NEPA regulations at 43 CFR 46.

The BLM used a multistep planning process when developing RDEP, as required by 43 CFR Part 1600, and illustrated in the BLM's Land Use Planning Handbook. The planning process is designed to help the BLM identify the uses of BLM-administered lands desired by the public. The process considers these uses to the extent they are consistent with the laws established by Congress and the policies of the executive branch of the federal government. The planning process is issue-driven. The BLM used the public scoping process to identify planning issues to direct the development of the RDEP alternatives.

2.1.6 Consultation and Collaboration

BLM land use planning regulations (43 CFR 1610.3), FLPMA (43 USC 1712), and regulations for implementing NEPA (40 CFR 1501.5 and 1501.6) guide the BLM in coordinating and cooperating with other federal and state agencies, local governments, and Native American tribes during the land use planning process. This collective guidance instructs the BLM to:

- Stay informed of federal, state, local, and tribal plans
- Ensure that it considers these plans in its own planning
- Help resolve inconsistencies between such plans and BLM planning
- Cooperate with other agencies and tribal governments in developing RMPs and NEPA analysis

In accordance with these provisions, the BLM initially informed other federal, state, local, and tribal officials of its intent to prepare RMPAs, as detailed in the Scoping Report. Collaboration with these agencies continued throughout the planning and EIS process. Agency coordination included reviewing numerous plans that provide the policies and guide the activities of these agencies and governments.

The BLM has coordinated with federal, state, and county agencies throughout the planning and EIS process. It gathered issues, ideas, and concerns and discussed the role of agencies in the process. A letter introducing the RDEP EIS, identifying data gathering, and offering agencies the opportunity to cooperate in the planning was sent to federal, state, and local agencies and tribes, followed by a cooperating agency meeting. The meeting agenda included discussions on the BLM's planning process, collaborative planning, the meaning and responsibilities of cooperating agency status, and opportunities for involvement in the BLM's planning and NEPA processes without becoming a cooperating agency. The BLM's goal was to encourage involvement by all interested parties using whatever methods the parties wished.

For those agencies that chose to cooperate, memoranda of understanding were developed outlining the roles and responsibilities of the cooperating agencies and the BLM throughout the planning process.

2.2 RESOURCE MANAGEMENT PLAN AMENDMENTS

2.2.1 Management Decisions

Lands Available for Renewable Energy Development

Lands identified as REDAs are available for renewable energy application. REDA lands are subject to the BLM renewable energy programs' policies and procedures. Applications for utility-scale solar energy development proposed within REDAs will comply with the decisions in the Solar PEIS ROD (BLM and DOE 2012c). The REDAs are within the Solar Program Variance Areas and have met some of the factors to be considered for project siting, including providing areas identified as suitable for solar energy development in areas of low resource conflict, opportunities for combining Federal and non-federal lands, and opportunities for projects to be developed on disturbed lands. Renewable energy projects are prioritized on REDA lands, subject to appropriate environmental review, but REDAs are available for multiple uses, including off-

highway vehicle use, grazing, and recreation, as allowed by the appropriate RMP decisions for the area. However, once the ROW process for a renewable energy project begins, the priority use of the area is for renewable energy development, subject to appropriate environmental review.

The allocated Agua Caliente SEZ is subject to the solar energy policies applicable to SEZs outlined in the Solar PEIS ROD (BLM and DOE 2012c).

Renewable Energy

Goals:

- Ensure the most environmentally responsible development and delivery of renewable energy
- Help meet community energy needs, create economic opportunities, and provide good value to the taxpayer

Objectives:

- Identify disturbed sites, such as brownfields, landfills, and abandoned mines, that could be reused for renewable energy development
- Identify areas with low resource sensitivity to lessen the risk of environmental conflicts
- Identify areas suitable for development that are adjacent to load centers
- Identify areas close enough to existing transmission to make it efficient and cost effective to bring the energy online
- Identify areas with enough acreage of public lands to help meet the renewable energy demand (including the Arizona Renewable Portfolio Standard) and provide flexibility for micro-siting and mitigation
- Identify a SEZ specifically for utility-scale solar energy developments (more than 20 megawatts), in accordance with national BLM policy and guidance (BLM and DOE 2010, 2011, 2012a, 2012c)
- Engage cooperating agencies, tribes, and stakeholders in order to obtain broad input on the desired future renewable energy footprint in Arizona and to inform renewable energy developers in their siting of projects throughout the state

Management Actions

Management actions are those that are anticipated to achieve the RDEP's goals and desired outcomes; they include actions to maintain, restore, or improve land health, as well as measures or criteria that will be applied to guide day-to-day activities (e.g., applications) on public lands. Management actions for renewable energy activities are as follows:

- Follow all applicable laws, regulations, policies, and guidance, including NEPA, Endangered Species Act, National Historic Preservation Act, and FLPMA
- Consult with cooperating agencies and stakeholders, federal and state resource management agencies, lease and mining claim holders and grazing permittees, and state, local, and tribal governments
- Prioritize processing of renewable energy development and electricity transmission applications within the SEZ and REDAs over similar applications located outside of the SEZ and REDAs
- Require appropriate design features for all renewable energy development projects on all lands available for application, as described in **Appendix B**, Design Features, Required Plans, and Best Management Practices. Apply design features as appropriate for the type, scale, location, and technology proposed for the development
- Do not authorize renewable energy development projects within a designated utility corridor
- Avoid creating areas that are difficult to manage. Consider the effect on the manageability and use of public lands around boundaries of renewable energy facilities during environmental analysis of project applications
- Consolidate access and other supporting infrastructure for single projects and for cases in which more than one project is close to another to maximize efficient use of public land
- Require additional documentation in cases where an energy development ROW application is submitted in an area with a high potential for conflict with the resources of a unit of the NPS or special areas administered by the NPS (BLM and DOE 2012c). This documentation may include information to verify any or all of the following potential resource conditions resulting from the proposed project:
    - Increased loading of fine particulates (criteria pollutants, which are $PM_{2.5}$ and PM_{10} [particulate matter with a diameter of 2.5 micrograms or less and 10 micrograms or less, respectively]) and reduced visibility in Class I and sensitive Class II areas
    - Vulnerability of sensitive cultural sites and landscapes and loss of historical interpretative value due to destruction or vandalism
    - Altered frequency and magnitude of floods and water quantity and quality

- Reduced habitat quality and integrity, wildlife movement, or migration corridors, and increased isolation and mortality of key species
- Fragmentation of natural landscapes
- Diminished wilderness, scenic viewsheds, and night sky values on landscapes within and beyond boundaries of areas administered by the NPS
- Diminished cultural landscape qualities within and beyond boundaries administered by the NPS

Design Features

Design features are means, measures, or practices intended to reduce or avoid adverse environmental impacts. In addition to incorporating the BMPs of the Wind PEIS ROD and design features of the Solar PEIS ROD, the RDEP includes a suite of design features specific to Arizona that establish the minimum specifications for managing individual renewable energy projects and mitigating adverse impacts. Appropriate design features must be incorporated into project-specific plans of development, plans of operation, and ROW grants. The design features are presented in **Appendix B**, Design Features, Required Plans, and Best Management Practices, by resource topic and project phase (siting and design, site characterization, construction, operations, and decommissioning).

Many of the design features indicate the need for project-specific plans and studies. The content and applicability of these plans will depend on specific project requirements and locations; however, the design features provide some guidance of what to include in specific plans. The authorizing officer will determine the adequacy of such plans before approving a specific project.

Land Tenure

Goal:

- Pursue land tenure adjustments to improve management of lands identified for disposal in existing RMPs to promote renewable energy development and resource conservation

Objective:

- To address resource issues and public needs, the BLM will consider, on a case-by-case basis, disposing of REDA lands identified for disposal in existing RMPs, in exchange for nonfederal lands within areas of high conservation priority. This could be done using a third-party transaction or direct exchange for lands with high conservation value

Management Actions

- Prior to any available disposal parcel being processed, an additional review is required to consider the possible presence of priority resources that warrant special protection or management that will be best achieved by retention in federal ownership (43 CFR 2430). Prior to disposal, all parcels will be reviewed and will not be disposed of if they have any of the following conditions:
    - Contain Sonoran desert tortoise habitat, unless land disposal through an exchange provides greater benefits to desert tortoises
    - Contain cultural resources eligible for listing on the National Register of Historic Places, where mitigation or data recovery has not occurred prior to patent
    - Are managed for wilderness characteristics
    - Are within the Colorado River 100-year floodplain or riparian areas
    - Will prohibit wild horse and burro free roaming within or between areas inside a herd management area or will eliminate habitat within the herd management area such that a the appropriate management levels will be significantly reduced
    - Contain designated or proposed critical habitat for threatened or endangered plant or animal species
    - Support listed or proposed threatened or endangered species, such that the disposal would be inconsistent with recovery needs and objectives or would be likely to affect the recovery of the listed or proposed species
    - Support federal candidate species, such that the disposal would contribute to the need to list the species as threatened or endangered
    - Contain other wildlife resource values of interest, such as BLM sensitive species or big game critical and crucial winter range

Exceptions to the previous criteria could occur if the recipient of the lands would protect the species or critical habitat equally well under the terms or criteria contained in the Endangered Species Act, such as disposal to a nonfederal governmental agency or private organization if conservation purposes for the species would still be achieved and ensured.

Given the screening criteria used to identify REDA lands, these conditions are unlikely to be present in most cases. REDA lands currently identified for

disposal will be disposed of with the goal of benefiting local economies and creating development incentives. It will also be used as a tool for acquiring nonfederal lands with high conservation value. For example, REDA lands identified for disposal could be exchanged for a nonfederal inholding within an ACEC, if such an exchange would improve protection of the relevant and important values of that ACEC.

Land Reuse

Goal:

- Establish sustainable development practices by reusing disturbed lands for renewable energy development

Objectives:

- For existing ROWs, the BLM will encourage concurrent authorized uses for renewable energy development, such as installing solar panels to help energize mine facilities
- For new actions, the BLM Arizona will require submission of proposals for retaining existing infrastructure and for rehabilitating, restoring, reclaiming, and remediating the landscape to meet renewable energy design features as part of plans of development, plans of operation, and other permitting documentation

Management Actions:

- Encourage modifying rehabilitation or remediation plans on in-progress or yet-to-be-rehabilitated lands with renewable energy development interest to meet renewable energy design feature standards
- Incorporate sustainable development and reuse concepts in the design of new projects
- Incorporate ongoing community engagement in all planning, development, implementation, and review actions. This will include working with utilities and the Arizona Corporation Commission to ensure selected sites fit within existing transmission systems and strategic goals

Remediation

There are no set rules for remediating disturbed sites, such as brownfields, landfills, and mining sites; no two sites are alike, and conditions can vary widely depending on location (e.g., level of contamination and economic incentives). However, there are some general goals, strategies, and BMPs that can be used effectively for remediating disturbed sites.

Goals:

- Through creative engineering solutions and environmental policies and programs, encourage remediation of previously disturbed lands to help create economic and social benefits, increase tax revenues, and further community development efforts
- Work with developers to make previously disturbed sites ready to accommodate renewable energy projects so growth can be directed to those areas where supporting infrastructure already exists
- Target environmental benefits of improved water and air quality and vegetation communities for wildlife through use of remediation protocols on previously disturbed sites

Management Actions:

- Work with developers to formulate a reuse assessment for the selected site. This involves an objective evaluation of opportunities, challenges, and possible implementation strategies. Additionally, in a reuse assessment, consider property condition (physical condition, obsolescence, defects, deferred maintenance), an analysis of the site as a whole (including any building structures and mechanical and electrical systems), safety issues, and environmental issues (e.g., contamination)
- Evaluate a location's compatibility with any BLM, state, county, or municipality goals, planning, zoning, and economics
- Evaluate the site's context within surrounding communities, properties, other agency lands, and stakeholders
- Identify economic assets, economic development opportunities, and economic impacts for the site as part of the reuse assessment
- Identify possible partnering opportunities for site remediation

Best Management Practices:

BMPs provide the most effective, environmentally sound, and economically feasible means of managing an activity and mitigating its impacts.

- Conduct public outreach and education to overcome misperceptions and build support for local projects. Conveying information about risk-based cleanup approaches, cost-effective engineering solutions, liability management options, and available funding programs helps generate interest in disturbed land reuse
- Integrate remediation and reuse with community priorities. Cleanup and reuse can address multiple community concerns, such as the need for locally generated clean energy
- Coordinate intra- and inter-governmental relations. Reusing and redeveloping disturbed lands is an interest of many traditionally

independent government departments; however, the independent agencies also may share a common interest in reuse and redevelopment to find mutually beneficial solutions

- Conduct all appropriate inquiry and due diligence as part of the site assessment, including reviewing existing records, interviewing previous owners and operators, identifying existing or past signs of contamination, and following American Society for Testing and Materials standards
- Plan for and, if necessary, conduct sampling and risk assessments as part of the cleanup process
- Remediate when contamination is determined to be an unacceptable risk to public health and the environment or exceeds a standard. Write and implement a remediation plan for the site

Site remediation is complete when the site is ready and available for reuse or when the specific renewable energy project construction begins.

Site cleanup and reuse can be mutually supportive by leveraging infrastructure needs, sharing data, minimizing demolition and earth-moving activities, reusing structures and demolition material, and combining other activities that support timely and cost-effective cleanup and reuse. Early consideration of green remediation opportunities offers the greatest flexibility and likelihood for related practices to be incorporated throughout a project life. While early planning is optimal, green strategies, such as engineering optimization, can be incorporated at any time during site investigation, remediation, or reuse (CDPHE 2005).

2.2.2 Renewable Energy Development Areas

Renewable Energy Development Areas are defined as:

- Areas more likely to have few resource conflicts that may affect development. Areas eliminated from REDA include those listed in **Table 2-1**, Areas with Known Sensitive Resources Eliminated from REDA Consideration. As noted in **Section 1.8.1**, Plan Maintenance and Data Refinement, data used in developing the Approved RMPAs were the best available data at that time. Data are also dynamic, and, in some cases, GIS data were unavailable for some planning areas and resources although new data may become available in the future. Thus, all acreages presented are estimations. The data and maps used to determine these areas and acreages were for land use plan amendment purposes only and will be verified or refined by site-specific information, as necessary. Updating data is considered plan maintenance and is expected to occur over time as the land use amendment decisions are implemented.

Table 2-1
Areas with Known Sensitive Resources Eliminated from REDA Consideration

Areas with Known Sensitive Resources	Source
BLM Areas of Critical Environmental Concerns	BLM 2011
BLM Backcountry Byways	BLM 2011
BLM Designated Wilderness and Wilderness Study Areas	BLM 2011
BLM lands with wilderness characteristics managed to protect those characteristics	BLM 2011
BLM lands with wilderness characteristics not managed to protect those characteristics	BLM 2011
BLM Visual Resource Management Classes I, II, and III	BLM 2011
BLM Special Recreation Management Areas	BLM 2011
BLM ROW exclusion or avoidance areas	BLM 2011
BLM Herd Management Areas	BLM 2011
Gila River Terraces ACEC	BLM 2011
Cultural sites well documented by the BLM, including House Rock Valley, Poston Butte, Petrified Forest Expansion Area, Gila River Terraces , and Clanton Hills	BLM 2011
Designated BLM utility corridors	BLM 2011
National Monuments	BLM 2011
National Conservation Areas	BLM 2011
Wild and Scenic Rivers (either eligible for or suitable for inclusion in the National Wild and Scenic Rivers System or rivers included in the National Wild and Scenic Rivers System)	BLM 2011
National Park System units, including Petrified Forest National Park Expansion Area	BLM 2011, SWReGAP 2011
National Park System National Historic Trails (0.25-mile buffer each side)	BLM 2011
Tribal lands	BLM 2011
Military lands	BLM 2011
State parks	Arizona State Parks 2010
State wildlife areas	BLM 2011
USFWS lands	BLM 2011
The Nature Conservancy conservation easements, Audubon Society land, and private conservation easements	SWReGAP 2011
US Forest Service Designated Wilderness	Forest Service 2010a
US Forest Service Established Research Natural Areas	Forest Service 2010b
US Forest Service Inventoried Roadless Areas	Forest Service 2010c
US Forest Service Heber Wild Horse and Burro Area	Forest Service undated
US Forest Service Special Interest Management Areas	Forest Service 2010b

Table 2-1
Areas with Known Sensitive Resources Eliminated from REDA Consideration

Areas with Known Sensitive Resources	Source
Incorporated cities (except when BLM land is included within the boundaries of an incorporated city)	ALRIS 2011
AGFD Areas of Conservation Potential, Tiers 4, 5, and 6	AGFD 2011
AGFD important big game habitat, including bighorn sheep, black bear, elk, javelina, mountain lion, mule deer, turkey, and white-tailed deer.[1]	AGFD 1988
Special status species, including threatened, endangered, and BLM sensitive species locations	AGFD 2010, BLM 2011
AGFD wildlife corridors	AGFD undated
USFWS critical habitat for threatened and endangered species	USFWS 2010
BLM sensitive species habitat	BLM 2011
Sonoran desert tortoise (*Gopherus agassizii*) Sonoran population habitat categories I, II, and III	BLM 2011
Desert tortoise conservation areas from the Solar PEIS	BLM and DOE 2012b
National Wetland Inventory wetlands	NWI 2010
Water bodies (lakes, rivers, and dry lakes)	BLM 2011
Federal Emergency Management Agency 100-year floodplains	FEMA 2010
Areas of high potential for known mineral deposits, metallic mineral districts, and Holbrook Basin potash potential	AZGS 2008, Arizona Bureau of Geology and Mineral Technology 1983, Arizona Bureau of Mines 1993
Sensitive fossil resources	BLM 2011
Severe soils: Clay Springs (runoff medium to rapid and erosion hazard moderate to severe) and Rositas (wind erosion severe if natural surface and cover disturbed)	BLM 2011, Description of Soil Series 2010
Greater than 5 percent slopes (or greater than 15 percent slopes for areas with wind potential)	USGS 2010, BLM 2011
REDAs less than 8 acres unless contiguous with larger REDAs	BLM 2011

[1]Bighorn sheep high density, medium, low, and sparse; black bear, high, medium, and low; elk summer high, medium, and low plus winter very high, high, medium, and low; javelina high and medium; mountain lion high; mule deer summer Kaibab high and medium, high plus winter Kaibab high and medium, high and medium; turkey summer high and medium plus winter high, medium, and low; white-tailed deer high and medium. Arizona Game and Fish Department describes wildlife density as number of animals per square mile.

- Areas close enough to transmission to make it efficient and cost effective to bring the energy online.
- Areas with potential or existing energy generation near the point of demand, such as cities, towns, or industrial center.
- Areas with additional resource protection measures including:
    - Implementing water resource design features, noted in **Table 2-2**, Water Protection Zones.
    - Prioritizing the available disposal lands for renewable energy purposes and add criteria to favor disposal in a manner that creates additional social and environmental benefits.

Table 2-2
Water Protection Zones

Water Protection Zone (WPZ) 3 represents the highest level of water resource protections and applies to basins that are currently overdrawn and that have long-term groundwater sustainability issues at baseline rates of groundwater consumption, based on the criteria listed below.

Criteria	Design Features
• Groundwater demand exceeds natural recharge AND one or more of the following: – Ratio of water demand to water in storage is less than or equal to 1:500 – Mean negative water level change rate is greater than -2 feet per year in one or more subbasins • San Pedro Priority Watershed to meet management objectives of the San Pedro Riparian National Conservation Area	All activities subject to applicable features, plus the following (applies only to new water developments): • De minimis use only (e.g., drinking water, solar panel washing) • Annual consumption will not exceed 55 acre-feet

WPZ 2—Represents a moderate level of water resource protections and applies to groundwater basins, surface watersheds, and other areas, based on the criteria listed below.

Criteria	Design Features
• Groundwater demand exceeds natural recharge AND one or more of the following: – Ratio of water demand to water in storage is less than or equal to 1:1,000 – Mean negative water level change rate is greater than -0.1 feet per year in one or more subbasins. • Environmental Protection Agency Sole Source Aquifers • BLM Priority Watersheds	All activities subject to applicable features, plus the following (applies only to new water developments): • Industrial water use limited to solar photovoltaic, solar thermal with dry-cooling, or similar low-water use technologies

WPZ 1—No additional levels of protection besides the standard design features discussed in **Section 2.2.1**, Management Decisions.

Areas where adequate data is not readily available to evaluate against the criteria have Zone 1

Table 2-2
Water Protection Zones

protections, at a minimum. May contain lands with limited or extremely challenging access to groundwater and those without availability of renewable water supplies and access to water delivery infrastructure. May also contain lands that may be diverting or pumping Colorado River water, requiring an allocation of Colorado River water for legal use. Additional protections may be afforded to these areas as specific project applications are received and the areas are further assessed.	
Criteria	**Design Features**
• Groundwater demand less than natural recharge.	• All activities subject to applicable design features, as discussed in **Section 2.2.1**, Management Decisions.

See **Figure 2-1**, Renewable Energy Development Areas on BLM-Administered Lands, for where REDAs are allocated across Arizona.

The REDAs are managed by using the goals, objectives, management actions, design features, and BMPs noted above in **Section 2.2.1**, Management Decisions. **Appendix A**, Renewable Energy Development Areas in Arizona Resource Management Plans, presents REDA acreages for BLM-administered land for each RMP amended by the RDEP ROD and the total REDA acreage for Arizona. See **Table A-1**, Acreage of Renewable Energy Development Areas by Water Protection Zone (WPZ).

Nominated Sites

RDEP has emphasized the reuse of previously disturbed or developed lands that, after remediation or site preparation, may be suitable for renewable energy development, thereby reducing impacts on sensitive resources.

Nominated sites were evaluated using readily available satellite photographs and site history to determine if there was notable disturbance; nominated sites determined to be disturbed were included in REDAs. The remaining sites, those that did not show notable disturbance, were evaluated using the REDA screening criteria noted in **Table 2-1**, Areas with Known Sensitive Resources Eliminated from REDA Consideration. If they met the REDA requirements, then they were included as REDA. If a nominated site was partially undisturbed or partly included sensitive resources, then only the areas with disturbance or no sensitive resources were included as REDA. This process resulted in 48 sites considered in the Final EIS (pages 2-7 to 2-8). Of these 48 sites included in REDA, only those that occur on BLM-administered lands (25 sites total) are carried forward in this ROD and included with allocated REDA. See **Table A-2**, Nominated Sites Included with REDA by Water Protection Zone (WPZ), in **Appendix A**, Renewable Energy Development Areas in Arizona Resource Management Plans, for the listing by planning area.

2.2.3 Additional Amendments to the Yuma Resource Management Plan for the Agua Caliente Solar Energy Zone

The Yuma RMP (BLM 2010a) is amended for the following decisions:

- Allocation of the 2,550-acre Agua Caliente SEZ (see **Figure 2-2**, Agua Caliente Solar Energy Zone).
- Establishment of renewable energy goals, objectives, management actions, and design features for application in the SEZ.
- Identification of SEZ-specific design features (see **Appendix B**, Design Features, Required Plans, and Best Management Practices, and the Sonoran pronghorn design features below).
- The visual resource management (VRM) designation within the SEZ is Class IV.
- There is no Wildlife Habitat Management Area within the SEZ.
- There is no Special Recreation Management Area designation within the Agua Caliente SEZ.
- The Palomas-Harquahala Road within the SEZ provides public access to other BLM lands to the north of the SEZ. Continued access along the road or alternative routes is required as a design feature for any application in the SEZ.
- The BLM will petition the Secretary of the Interior to withdraw 2,550 acres in the Agua Caliente SEZ from settlement, sale, location, or entry under the general land laws, including the mining laws, to protect and preserve the area for future solar energy development.

Management of the Agua Caliente SEZ follows the requirements of the Solar Energy Program from the Solar PEIS ROD (BLM and DOE 2012c) and management actions, design features, and BMPs noted in **Section 2.2.1**, Management Decisions. The SEZ includes the design features noted under Water Protection Zone 2, as described in **Table 2-2**, Water Protection Zones, and the following specific design features for Sonoran pronghorn; the BLM will:

- Report sightings of or signs of Sonoran pronghorn in the vicinity of the Agua Caliente SEZ to the USFWS and Arizona Game and Fish Department. Documentation of sightings of animals, tracks, droppings, and hair, through digital or other photography, to the extent practical, is recommended.
- Lay out of fencing around renewable energy facilities avoid creating "dead end" or "trap" areas between fenced areas to allow easy egress for Sonoran pronghorn from the area if startled by humans or predators. The USFWS also recommended designing fencing to avoid ensnarling pronghorn and other large mammals.

Renewable Energy Development Areas on BLM-Administered Lands

Renewable Energy Development Areas (REDAs) are made up of lands with low known resource sensitivity and the nominated sites on BLM-administered land. Goals, objectives, and management actions follow the decisions noted in Section 2.2.1, Management Decisions.

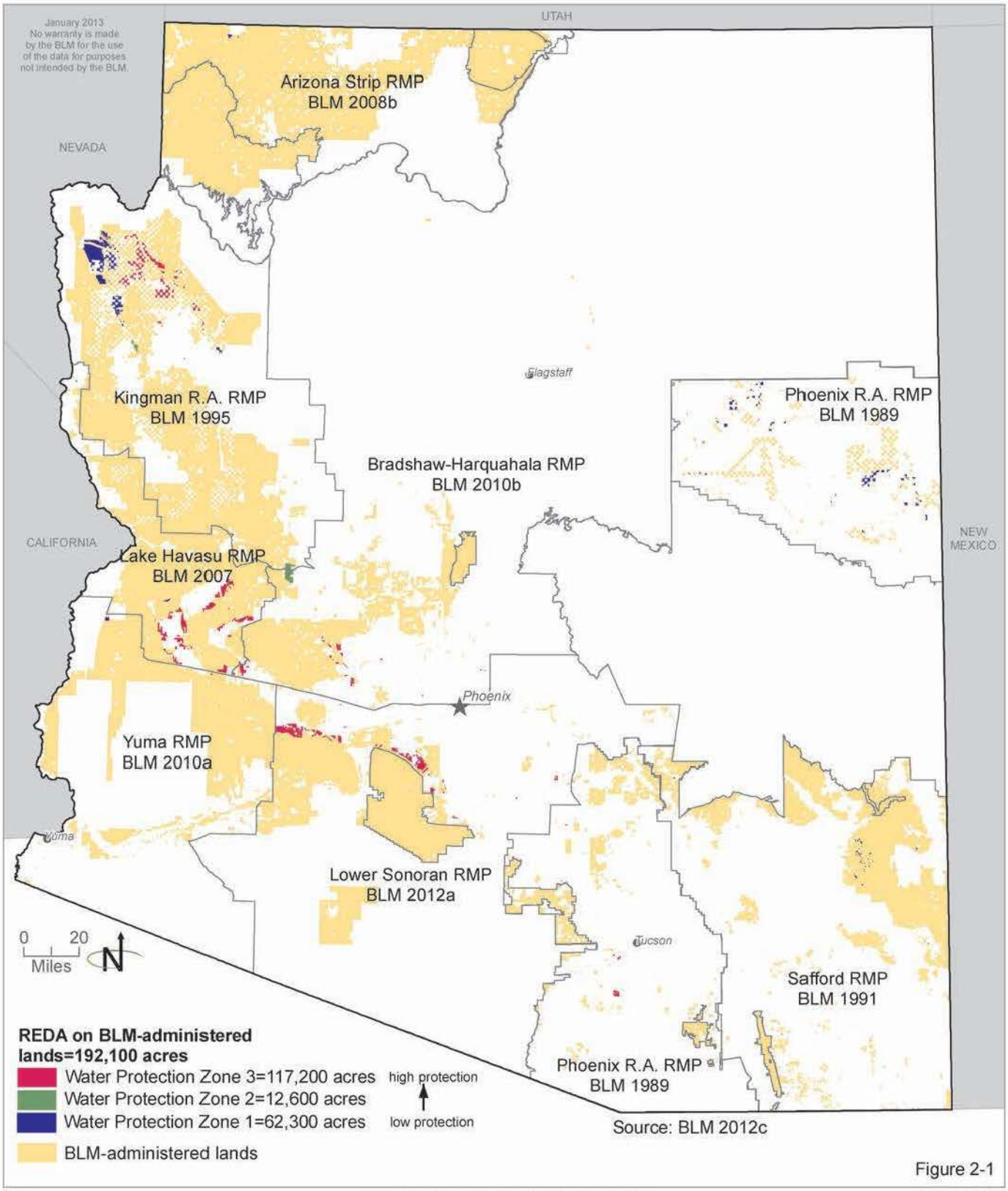

Figure 2-1

Agua Caliente Solar Energy Zone

The 2,550 acre Agua Caliente Solar Energy Zone follows the requirements of the Solar Energy Program from the Solar PEIS ROD (BLM and DOE 2012c) and management actions, design features, and BMPs noted in Section 2.2.1, Management Decisions. The SEZ includes the design features noted under Water Protection Zone 2 and additional SEZ-specific design features for Sonoran pronghorn as described in Section 2.2.3, Additional Amendments to the Yuma RMP for the Agua Caliente SEZ.

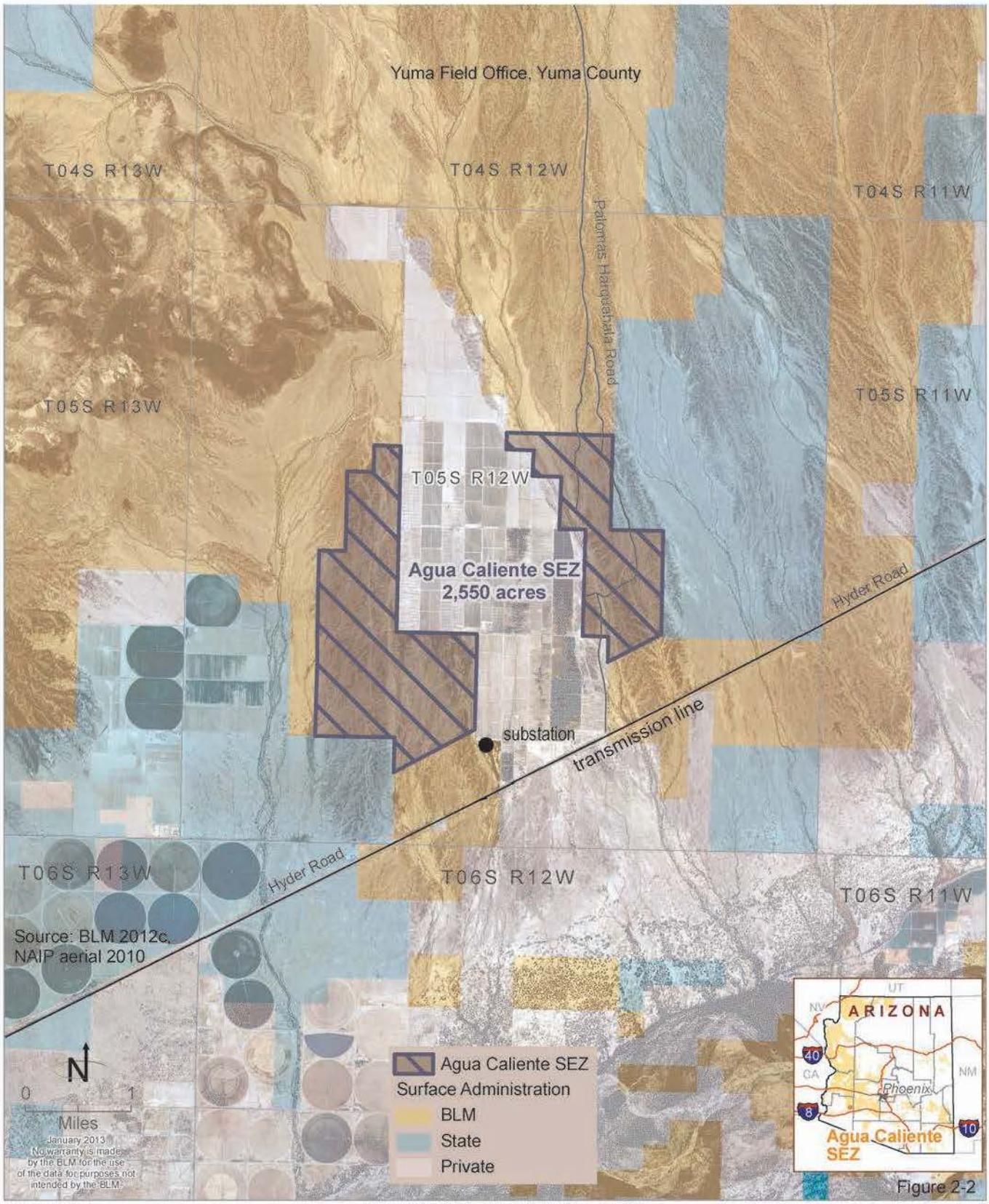

Figure 2-2

- Include briefing materials on Sonoran pronghorn in Worker Education and Awareness Programs for construction workers at renewable energy facility sites within the Agua Caliente SEZ, including identification and the importance of avoiding disturbing any animals encountered. The USFWS also recommended that the BLM work with them and the Arizona Game and Fish Department in development of Worker Education and Awareness Programs material for Sonoran pronghorn.
- Keep work areas clean, including of eliminating edible garbage, and prohibiting the feeding of animals.

2.3 IMPLEMENTATION AND PUBLIC INVOLVEMENT

The decisions of the Plan Amendments go into effect upon signature of the ROD. However, the BLM will conduct site-specific environmental review for future renewable energy development proposals that may be proposed in REDAs or the Agua Caliente SEZ. The BLM will make individual decisions on a case-by-case basis whether or not to authorize specific renewable energy development projects in conformance with the relevant amended land use plan. Analysis of proposed solar and wind energy development projects must comply with NEPA and NEPA regulations (40 CFR, Parts 1500-1508; 43 CFR Part 46). The BLM will notify and engage the public to participate and comment during any future NEPA processes.

The BLM will continue to work with existing partners, cultivate new partnerships, and actively seek the views of the public, using techniques such as news releases, website postings, and mass mailings to ask for participation and to inform the public of new and ongoing renewable energy proposals. The BLM will also continue to coordinate, both formally and informally, with the numerous federal and state agencies, Native American tribes, local agencies, and officials interested and involved in renewable energy in Arizona.

2.4 PLAN EVALUATION AND MAINTENANCE

2.4.1 Plan Evaluation

Evaluation is a process in which the plan and monitoring data are reviewed to determine if management goals and objectives are being met and if management direction is sound. Land use plan evaluations determine the following:

- If decisions are being implemented
- If mitigation measures are satisfactory
- If there are significant changes in the related plans of other entities
- If there is new data of significance
- If decisions should change through amendment or revision

Monitoring data gathered over time is examined and used to determine whether management actions are meeting objectives. Conclusions are then used to make recommendations on whether to continue current management or to identify what changes need to be made in management practices to meet RMP and amendment objectives.

The BLM will use land use plan evaluations to determine if the decisions in the RMPAs, supported by the accompanying NEPA analysis, are still valid in light of new information and monitoring data. The RMPs and amendments will generally be evaluated every five years, unless unexpected actions, new information, or significant changes in other plans, legislation, or litigation triggers an evaluation. Evaluations will follow the protocols established by the BLM's Land Use Planning Handbook (BLM 2005) and 43 CFR Part 1610.4-9, or other appropriate guidance in effect at the time of the evaluation.

2.4.2 Plan Maintenance

Land use plan decisions and supporting information can be maintained to reflect minor changes in data, but maintenance is limited to refining, documenting, and clarifying previously approved decisions. Some examples of maintenance actions are as follows:

- Correcting minor data, typographical, mapping, or tabular data errors
- Refining baseline information as a result of new inventory data (e.g., changing the boundary of an archaeological district, refining the known habitat of special status species, or adjusting the boundary of a fire management unit based on updated fire regime condition class inventory, fire occurrence, monitoring data, or demographic changes)
- Applying an existing fluid mineral lease stipulation to a new area prior to the lease sale, based on new inventory data (e.g., apply an existing protective stipulation for tortoise to a newly discovered tortoise habitat area)

As noted in **Section 1.8.1**, Plan Maintenance and Data Refinement, data used in developing the Approved RMPAs are dynamic, and, in some cases, GIS data were unavailable for some planning areas and resources, although they may become available in the future. Thus, all acreages presented in the **Approved Resource Management Plan Amendments** and **Appendix A**, Renewable Energy Development Areas in Arizona Resource Management Plans, are estimations. The data and maps used throughout the RDEP Final EIS are for land use planning purposes only and will be verified or refined by site-specific information, as necessary. Updating data is considered plan maintenance and is expected to occur over time as the land use amendment decisions are implemented. Plan maintenance will be documented in supporting records. Plan maintenance does not require formal public involvement, interagency

coordination, or the NEPA analysis required for making new land use plan decisions.

2.5 MONITORING AND ADAPTIVE MANAGEMENT

2.5.1 Monitoring

The BLM expects that new information gathered from field inventories and assessments, research, other agency studies, and other sources will update baseline data, GIS data, and support new management techniques, BMPs, and scientific principles. Monitoring the RMP and amendments involves tracking the implementation and effectiveness of land use plan decisions (implementation monitoring) identified in **Section 2.2.1**, Management Decisions. Implementation monitoring tracks the completion of land use plan decisions, whereas effectiveness monitoring helps determine whether completion of land use plan decisions achieves anticipated desired outcomes. If implementation of land use plans does not achieve anticipated desired outcomes, adaptive management may be necessary.

Management actions are based on studies and the best scientific and commercial information available, but conditions may change over time. Experience has shown that implemented management actions can be improved as new technology and new information become available. It is also possible that changes in land use will require a different management action to protect the resources. To address the changing conditions and provide management flexibility using BMPs, Arizona BLM will monitor and evaluate the RMPAs using a process that provides the optimum means of checking the effectiveness of management actions. This process will measure the effectiveness of existing actions by monitoring these actions and applying the results of new scientific research. To do this, the process will analyze the current resource conditions resulting from implemented actions and will identify and recommend alternatives or modified actions, as necessary, to reach established objectives and goals.

Because capability to conduct the process at the optimum level can vary from year to year, the actions to be monitored will be prioritized. If monitoring indicates the goals and objectives are not being met, the adaptive management process will be implemented to adjust actions and improve resource condition.

2.5.2 Adaptive Management

Adaptive management is a system of management practices based on clearly identified outcomes, monitoring to determine if management actions are meeting outcomes, and, if not, facilitating management changes that will best ensure that outcomes are met or to reevaluate the outcomes. Arizona BLM will implement adaptive management for decisions appropriate to be adapted in order to meet resource goals and objectives. Monitoring, reports, documents, and timelines associated with adaptive management will be subject to budget and staffing constraints.



REFERENCES

REFERENCES

Arizona Bureau of Geology and Mineral Technology (now known as Arizona Geological Survey). 1983. Published map of Metallic Mineral Districts of Arizona, by Stanley B. Keith, Don Egest, and Ed DeWitt. Digitized into GIS data by Scott Jonker, EMPSi, August 2011.

Arizona Bureau of Mines. 1993. Published GIS data on Known Mineral Deposit Areas. Acquired from Anthony Maslowicz, Arizona State Land Department, February 15, 2011.

AGFD (Arizona Game and Fish Department). 1988. Unpublished GIS data on Big Game Species, some species updated in 2004. Acquired via FTP from Sabra Schwartz, September 1, 2010.

_____. 2010. Unpublished sensitive data on special status species from the Heritage Database Management System. Acquired via FTP from Sabra Schwartz, September 29, 2010.

_____. 2011. Unpublished GIS data on Conservation Potential, Species and Habitat Conservation Guide Tiers. Acquired via e-mail from Joyce Francis, August 29, 2011.

_____. Undated. Published GIS data on Beier Wildlife Corridors. Acquired via e-mail from Sabra Schwartz, September 1, 2010.

AZGS (Arizona Geological Survey). 2008. Potash and Related Resources of the Holbrook Basin, Arizona, and map, by Steven L. Rauzi. Open File Report OFR 08-07.

ALRIS (Arizona Land Resource Information System). 2011. Published GIS data on incorporated city boundaries. Arizona State Land Department. Internet website: http://www.land.state.az.us/alris/data.html. Acquired from Anthony Maslowicz, Arizona State Land Department. Accessed on May 16, 2011.

Arizona State Parks. 2010. Published GIS data on state parks. Acquired via FTP from Vincent Schiavitti, September 1, 2010.

Black and Veatch. 2007. Arizona Renewable Energy Assessment, Final Report. Prepared for the Arizona Public Service Company, Salt River Project, and Tucson Electric Power Corporation. September 2007.

BLM (US Department of the Interior, Bureau of Land Management). 1989. Phoenix Resource Area Resource Management Plan and Final Environmental Impact Statement. Phoenix Resource Area Office, Phoenix, Arizona.

_____. 1991. Safford Resource Area Resource Management Plan and Final Environmental Impact Statement. Safford Resource Area Office, Safford, Arizona.

_____. 1995. Kingman Resource Area Resource Management Plan and Final Environmental Impact Statement. Kingman Resource Area Office, Kingman, Arizona.

_____. 2004a. Manual Section 8120: Tribal Consultation under Cultural Resources. December 3, 2004. BLM National website: http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/blm_manual.html. Accessed November 28, 2012.

_____. 2004b. Handbook H-8102-1: General Procedural Guidance for Native American Consultation. December 3, 2004. BLM National website: http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/blm_handbooks.html. Accessed November 28, 2012.

_____. 2005. Handbook H-1601-1: Land Use Planning Handbook. Washington, DC. March 2005.

_____. 2007. Lake Havasu Field Office Resource Management Plan and Final Environmental Impact Statement. Lake Havasu Field Office, Lake Havasu, Arizona.

_____. 2008a. Handbook H-1790-1 – National Environmental Policy Act. BLM. Washington, DC. January 2008.

_____. 2008b. Arizona Strip Field Office Resource Management Plan and Record of Decision. Arizona Strip Field Office. St. George, Utah.

_____. 2010a. Yuma Field Office Record of Decision and Approved Resource Management Plan. Yuma Field Office, Yuma, Arizona.

_____. 2010b. Bradshaw-Harquahala Resource Management Plan. Hassayampa Field Office, Phoenix, Arizona.

_____. 2011. GIS data on file with BLM's eGIS server. Department of the Interior, BLM, Arizona State Office. Phoenix, Arizona.

_____. 2012a. Lower Sonoran Record of Decision and Approved Resource Management Plan. Lower Sonoran Field Office, Phoenix, Arizona.

_____. 2012b. Restoration Design Energy Project Final Environmental Impact Statement. BLM Arizona State Office, Phoenix, Arizona.

_____. 2012c. GIS data created to describe RDEP alternatives, last edited August 2012. Department of the Interior, BLM, Arizona State Office. Phoenix, Arizona.

BLM and DOE (US Department of the Interior, Bureau of Land Management, and US Department of Energy). 2012. GIS data on desert tortoise conservation areas, variance areas, Arizona SEZs, and NPS identified areas of high potential for resource conflict from the Final Solar PEIS. Internet website: http://solareis.anl.gov/maps/gis/index.cfm. Accessed July 2012.

_____. 2010. Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States. December 2010.

_____. 2011. Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States. October 2011.

_____. 2012a. Final Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States. July 2012.

_____. 2012b. GIS data on desert tortoise conservation areas, variance areas, Arizona SEZs, and NPS identified areas of high potential for resource conflict from the Final Solar PEIS. Internet website: http://solareis.anl.gov/maps/gis/index.cfm. Accessed July 2012.

_____. 2012c. Record of Decision for the Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States. September 2012.

CDPHE (Colorado Department of Public Health and Environment). 2005. The Colorado Brownfields Handbook: A Local Government Guide to Site Reuse and Economic Development. Hazardous Materials and Waste Management Division, Denver, Colorado.

Description of Soil Series. 2010. The University of Arizona Library, Books of the Southwest. Internet website: http://southwest.library.arizona.edu/azso/back.1_div.5.html. Accessed on October 29, 2010.

Federal Register. 2000. Executive Order 13175 of November 6, 2000, "Consultation and Coordination with Indian Tribal Governments." Volume 66, pp. 67249-67252. Washington, DC. November 9, 2000.

_____. 2001. Executive Order 13212 of May 18, 2001, "Actions To Expedite Energy-Related Project." Volume 66, pp. 28357-28358. Washington, DC. May 22, 2001.

_____. 2010. Notice of Intent to Prepare an Environmental Impact Statement for the Restoration Design Energy Project and Possible Land Use Plan Amendment. Volume 75, pp. 1807-1809. Washington, DC. January 13, 2010.

_____. 2012a. Notice of Availability of the Draft Environmental Impact Statement for the Restoration Design Energy Project and Land Use Plan Amendments. Volume 77, pp. 9694-9696. Washington, DC. February 17, 2012.

_____. 2012b. Environmental Impacts Statements; Notice of Availability. Volume 77, p. 66183. Washington, DC. November 2, 2012.

FEMA (Federal Emergency Management Agency). 2010. Published GIS data on 100-Year Floodplains. Accessed via CD in August 2010.

Forest Service. 2010a. Published GIS Data on Designated Wilderness Areas. US Department of Agriculture, National Forest Service. Internet website: http://www.fs.fed.us/r3/gis/datasets.shtml. Accessed on August 29, 2010.

_____. 2010b. Published GIS Data on Established Research Natural Areas and Special Interest Management Areas. Internet website: http://www.fs.fed.us/r3/gis/datasets.shtml. Accessed on August 29, 2010.

_____. 2010c. Published GIS Data on Inventoried Roadless Areas. Internet website: http://fs.usda.gov/Internet/FSE_DOCUMENTS/fsmrs_072343.pdf. Accessed on August 25, 2010.

_____. Undated. Published Map on Heber Wild Horses and Burros. Internet website: http://www.fs.fed.us/r3/asnf/wildhorse/images/wildhorse-genmap. Accessed in August 2010.

NAIP (National Agricultural Imagery Program). 2010. Aerial image of Agua Caliente SEZ. Farm Service Agency, U.S. Department of Agriculture.

NWI (National Wetlands Inventory). 2010. Published GIS Data on Wetlands. Internet website: http://www.fws.gov/wetlands/Data/DataDownload.html#State. Accessed on August 16, 2010.

Secretary of the Interior. 2010. Renewable Energy Development by the Department of the Interior, Amendment No. 1 to Secretarial Order 3285, February 22. Internet website: http://elips.doi.gov/elips/0/doc/151/Page1.aspx. Accessed on November 30. 2012.

SWReGAP (The Southwest Regional Gap Analysis Project). 2011. Published data on GIS Stewardship dataset. Internet website: http://fws-nmcfwru.nmsu.edu/swregap/Stewardship/Default.htm. Accessed on January 17, 2011.

USFWS (US Fish and Wildlife Service). 2010. Published GIS Data on Critical Habitat for Threatened and Endangered Species. Internet website: http://criticalhabitat.fws.gov/. Accessed on August 31, 2010.

_____. 2011. Establishment of a Nonessential Experimental Population of Sonoran Pronghorn in Southwestern Arizona, Final Rule. Federal Register 76(87): 25593-25611.

USGS (US Geological Survey). 2010. Digital GIS elevation model of the state of Arizona, used in slope model. Acquired via BLM Arizona State Office eGIS server.



APPENDIX A

RENEWABLE ENERGY DEVELOPMENT AREAS IN ARIZONA RESOURCE MANAGEMENT PLANS

APPENDIX A
RENEWABLE ENERGY DEVELOPMENT AREAS IN ARIZONA RESOURCE MANAGEMENT PLANS

As detailed in **Section 2.2**, Land Use Plan Amendments, the Restoration Design Energy Project (RDEP) Record of Decision (ROD) records the decisions of the BLM Arizona State Director to establish land use allocations and desired outcomes (goals and objectives) for solar and wind energy development on BLM-administered lands in Arizona, regardless of technology used (e.g., concentrated solar power, photovoltaic, wind turbine) or scale of development (e.g., utility-scale, distributed small scale). This includes the following:

- Identifying Renewable Energy Development Areas (REDAs)
- Establishing goals, objectives, and management actions for renewable energy development
- Identifying REDA land disposal criteria for future land disposal allocation decisions and disposal actions, including land exchanges and sales
- Identifying terms and conditions, including design features and mitigation measures, to minimize environmental impacts that can be used to guide development on any lands available for application for renewable energy (see **Appendix B**, Design Features, Required Plans, and Best Management Practices)
- Establishing goals, objectives, and management actions for land reuse and sustainability practices
- Establishing goals, objectives, and management actions for remediating previously disturbed land

This appendix details the RDEP REDAs within each Arizona Resource Management Plan (RMP) amended by the RDEP ROD. **Table A-1**, Acreage of Renewable Energy Development Areas by Water Protection Zone (WPZ), **Table A-2**, Nominated Sites Included with REDA by Water Protection Zone (WPZ), and **Figure A-1**, Renewable Energy Development Areas on BLM-administered Land, present the REDA acreages in tabular and graphic form for each Arizona RMP.

As noted in **Section 1.8.1**, Plan Maintenance and Data Refinement, data used in developing the Approved RMP Amendments were the best available data at that time. Data are also dynamic, and, in some cases, GIS data were unavailable for some planning areas and resources although new data may become available in the future. Thus, all acreages presented are estimations. The data and maps used to determine these areas and acreages were for land use plan amendment purposes only and will be verified and refined by site-specific information, as necessary. Updating data is considered plan maintenance and is expected to occur over time as the land use amendment decisions are implemented.

Table A-1
Acreage of Renewable Energy Development Areas by Water Protection Zone (WPZ)

	Total BLM-Administered Land	Arizona Strip RMP	Bradshaw-Harquahala RMP	Kingman Resource Area RMP	Lake Havasu RMP	Lower Sonoran RMP	Phoenix RMP	Safford RMP	Yuma RMP
REDA in WPZ 3	117,200[1]	0	9,437	26,697	40,374	37,504	3,064	0	159
REDA in WPZ 2	12,600	82	7,383	4,913	0	168	0	12	91
REDA in WPZ 1	62,300	919	0	46,668	591	0	11,712	1,432	929
Total REDA	**192,100**	**1,001**	**16,820**	**78,278**	**40,965**	**37,672**	**14,776**	**1,444**	**1,179**

[1] The total acreage amounts have been rounded up or down to the nearest 100 acres based on adding the individual RMP acreage totals.

Table A-2
Nominated Sites Included with REDA by Water Protection Zone (WPZ)

Resource Management Plan	Site Name	BLM-Administered Acres in REDA	WPZ
Arizona Strip RMP (BLM 2008)	Fredonia Landfill	21	WPZ 2
	White Sage Gravel Pits	61	WPZ 2
	Black Rock Gypsum Mine	679	WPZ 1
	Mokaac Gravel Pit	80	WPZ 1
	Page Landfill	160	WPZ 1
Bradshaw-Harquahala RMP (BLM 2010)	Cave Creek Landfill	42	WPZ 3
	Litchfield Park Urban Parcel	41	WPZ 3
	Belmont Proposed Disposal	1,607	WPZ 3
	Black Canyon City Landfill	25	WPZ 2
	Cordes Lakes Hazmat Site	14	WPZ 2
Kingman Resource Area RMP (BLM 1995)	None		
Lake Havasu RMP (BLM 2007)	Harcuvar Substation	59	WPZ 3
	Silver Creek Landfill	50	WPZ 1
Lower Sonoran RMP (BLM 2012)	Mobile Proposed Disposal	1,266	WPZ 3
Phoenix RMP (BLM 1989)	Brady CAP* Site	136	WPZ 3
	Dog Town Mine	2,080	WPZ 3
	Florence – Price Dump	85	WPZ 3
	La Osa Surface Disturbance	41	WPZ 3
	Saginaw Hill	503	WPZ 3
	Snyder Hill Mine	176	WPZ 3
	Tombstone Landfill	43	WPZ 3
	Christmas Mine (BLM portion)	57	WPZ 1
Safford RMP (BLM 1991)	None		
Yuma RMP (BLM 2010)	Little Harquahala CAP Site	159	WPZ 3
	Dateland Gravel Pit	64	WPZ 2
	Old Yuma County FUP Site	27	WPZ 2
	Copperstone Mine	929	WPZ 1

*Central Arizona Project

Renewable Energy Development Areas on BLM-Administered Lands

Renewable Energy Development Areas (REDAs) are made up of lands with low known resource sensitivity and the nominated sites on BLM-administered land. Goals, objectives, and management actions follow the decisions noted in Section 2.2.1, Management Decisions.

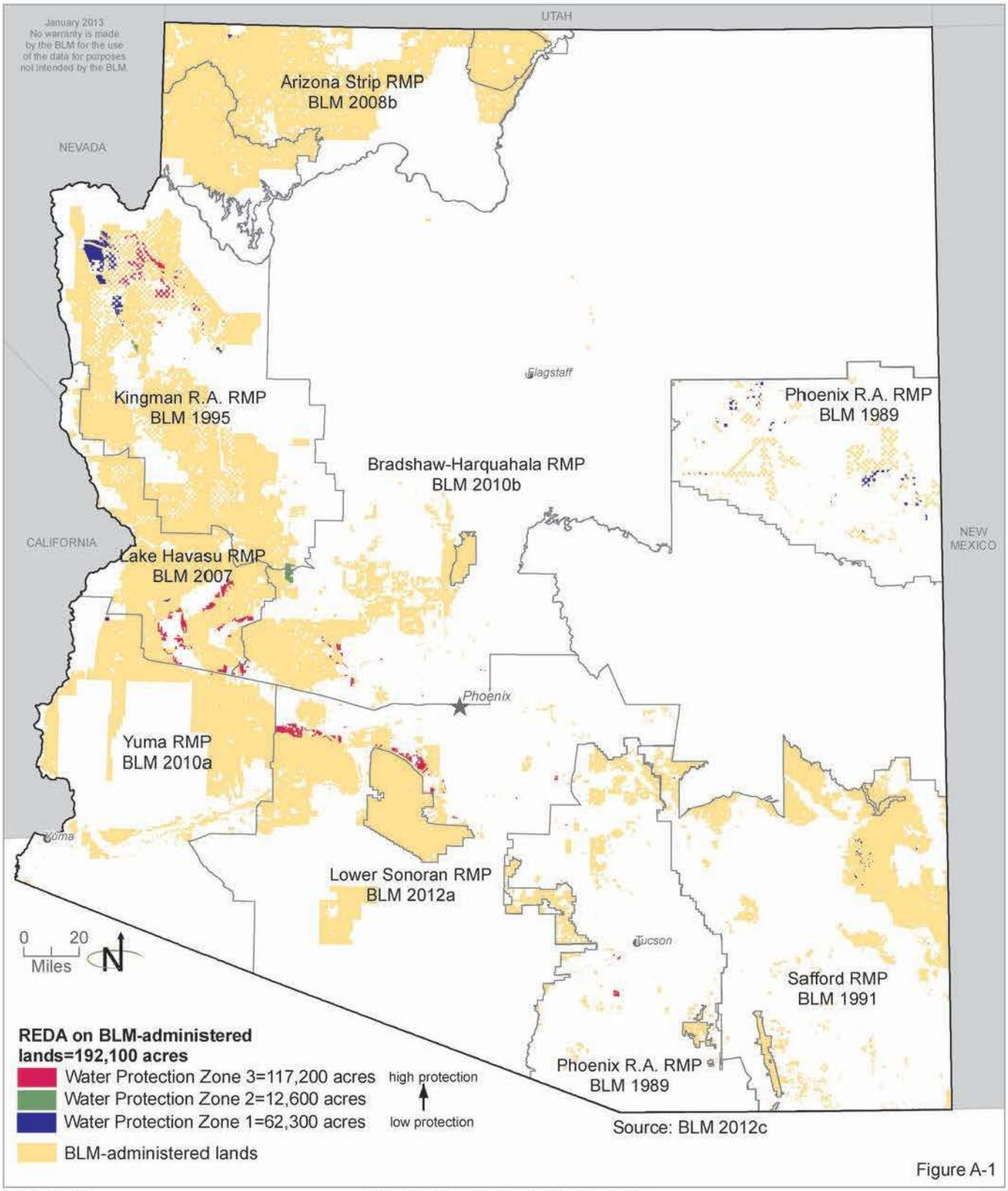

Figure A-1

This page intentionally left blank.



APPENDIX B

DESIGN FEATURES, REQUIRED PLANS, AND BEST MANAGEMENT PRACTICES

APPENDIX B
DESIGN FEATURES, REQUIRED PLANS, AND BEST MANAGEMENT PRACTICES

This appendix provides the Restoration Design Energy Project (RDEP) design features, required plans and best management practices (BMPs) associated with siting and design, construction, operation and maintenance, and decommissioning of renewable energy projects. Design features are requirements that must be met by the applicant and must be incorporated into project-specific Plans of Development (PODs), Plans of Operations, and rights-of-way (ROW) grants. In general, the design features are accepted practices that are known to be effective when implemented properly at the project level. However, their applicability and overall effectiveness cannot be fully assessed except at the project-specific level when the project location and design are known. Design features would establish the minimum specifications for renewable energy projects and mitigate adverse impacts and would be applied as appropriate to the location of, and type, scale, and technology used in a development.

All of the design features identified in the Solar Programmatic Record of Decision (Solar PEIS ROD, BLM and DOE 2012c) would be applied to utility-scale solar development in Arizona. In addition, Table B-1, Design Features, lists design features that would be unique to RDEP. All of the mitigation measures identified here are intended for use on solar and wind projects in Arizona, and are to be applied based on the project design, technology used, and project location. The measures are organized by major resource topics and identify the phase(s) during which each measure would be implemented: S – siting and design; C – construction; O – operation and maintenance; and D – decommissioning and reclamation. Many of the potential design features indicate the need for project-specific plans or studies. The plans are included in **Table B-2**, Required Plans, and the studies are included in **Table B-3**, Required Studies. The content and applicability of these plans and studies will depend on specific project requirements and locations; however, some guidance is

provided for what to include in specific plans. The authorizing officer would need to determine the adequacy of such plans or studies before approving a specific project.

Best management practices provided in **Table B-4**, Best Management Practices, are state-of-the-art mitigation measures applied on a site-specific basis to avoid, minimize, reduce, rectify, or compensate for adverse environmental or social impacts. They are selectively applied to projects to aid in achieving desired outcomes for safe, environmentally responsible development, by preventing, minimizing, or mitigating adverse impacts and reducing conflicts. BMPs can also be proposed by project applicants for activities on public lands (e.g., for solar and wind development). BMPs not incorporated into the permit application by the applicant may be considered and evaluated through the environmental review process and incorporated into the use authorization as conditions of approval or rights of way stipulations.

Design features and BMPs would apply to solar and wind projects, as applicable based on the technology used, and on all BLM-administered lands in Arizona that are available for application, including REDAs and SEZs.

Table B-1
Design Features

No.	Topic	Description of Measure	Phase
Air Quality			
1	Emissions	Staging and queuing areas will not be located within 1,000 feet of sensitive receptors.	C, O, D
2	Fugitive dust	All soil disturbance activities and travel on unpaved roads shall be suspended during periods of high winds. A critical site-specific wind speed shall be established based on soil properties determined during site characterization, and wind speed monitoring is required at the site during construction, operation, and reclamation.	C, O, D
Aviation			
3	Restricted airspace	In applications to appropriate lead agencies, provide a copy of a letter stating that the proposed project is compatible with the Airport Land Use Compatibility Plan. The following locations and design features may contribute to a decision that the facility is incompatible with operations of a nearby airport: • Siting the facility within 5,000 feet from a heliport or 20,000 feet (3.8 miles) of a runway that is at least 3,200 feet in actual length. • Locating portions of a facility within a designated airport safety zone, airport influence area, or airport referral area. • Introducing a thermal plume, visible plume, glare, or electrical interference into navigable airspace on or near an airport. • Proposing a structure that will exceed 200 feet in height above ground level.	S
4	Restricted airspace	Consult with the FAA regarding the heights of the project structures and avoid conflicts with aviation. Design the project to comply with FAA regulations, including lighting regulations, and to avoid potential safety issues associated with proximity to airports or landing strips.	S

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
Cultural Resources			
5	Cultural surveys	A phased sampling strategy, beginning with a Class II inventory to assess various alternative development areas, is recommended prior to the selection of individual project locations. Class II inventory shall meet the standards set forth in the Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44716), BLM Handbook H-8110: Guidelines for Identifying Cultural Resources (BLM 2002), and revised BLM Manual 8110 (BLM 2004).	S
6	Cultural surveys	Develop and implement a survey plan to conduct a Class III inventory in accordance with BLM and SHPO standards. Levels of inventory will be sufficient to identify and evaluate resources that could be directly or indirectly affected by the proposed project, associated facilities, and access roads.	
7	Cultural surveys	Following field surveys ensure the survey report documents previously unrecorded and newly discovered resources information. Provide information necessary for evaluating each newly discovered resource's eligibility for the NRHP. Ensure the cultural resources specialist completes a technical report detailing the records search results, each survey's methods and results, including identified resources evaluations, and recommendations for resource evaluations based on the NRHP eligibility criteria. The reports should meet the lead agency's or agencies' published standards.	S
8	Cultural surveys	Retain the services of a geoarchaeologist, when appropriate, to investigate and complete a geomorphology technical report. Include the following elements: • Reconstruct the historical geomorphology of the project's Area of Potential Effects (APE); • Map and date the sediments of the landforms in that area; • Assess whether buried archaeological deposits may be present and subject to project impacts.	S
9	Monitoring and Mitigation	Retain a qualified cultural resources specialist to write and carry out a monitoring and mitigation plan or agreement, when applicable, and to be available if cultural resources are encountered during construction. Avoidance of known cultural resources is generally the preferred resolution option; include in the plan measures to protect avoided resources during construction and to prevent looting/vandalism and erosion. If project impacts to known NRHP-eligible cultural resources are unavoidable, data recovery may be approved as a mitigation measure; include a data recovery strategy in the plan. The project developer may also be asked by the appropriate lead agency to include additional measures for addressing the discovery of previously unknown cultural resources during construction. Consider the following measures, at a minimum: • Hire a qualified archaeological monitor to oversee project excavations and to monitor resources that will be protected from disturbance by construction-related activities. • Develop and use a cultural resources construction personnel training program to promote cultural resources identification and lawful and appropriate response to discoveries.	C, O, D

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
		• Notify involved agencies of unexpected cultural or historical resources discoveries during construction. The project developer may be asked or ordered to cease construction in the vicinity of the discovery to allow evaluation by an agency archaeologist and formulation of appropriate mitigation measures. • If human remains are discovered, cease construction and consult with the lead agencies. It is advisable to prepare a Plan of Action to address anticipated or unanticipated discoveries of materials protected under the Native American Graves Protection and Repatriation Act (NAGPRA), even if such discoveries appear to be unlikely on the basis of the survey results. • Where project construction would directly and adversely affect NRHP eligible properties, scientific data recovery may be selected as an appropriate mitigation measure. Data recovery procedures shall be conducted in accordance with an agency-approved Data Recovery Plan including a detailed research design and methodology. • Have the cultural resources specialist prepare a report documenting archaeological monitoring and data recovery activities.	
10	Treatment plans	In accordance with applicable Section 106 agreement documents and NEPA analyses, prepare and implement cultural resource management plans (including Historic Properties Treatment Plans) to avoid, mitigate, or otherwise resolve adverse effects in consultation with the SHPO, Indian tribes, project applicant, and other consulting parties. Treatment plans will guide: • Completion of any supplemental surveys needed to address refinements in the final project design to ensure full coverage of areas that could be affected.. • Outstanding geoarchaeological investigations. • Evaluation of newly identified cultural resources for NRHP eligibility. • Assessment of project impacts to NRHP-eligible cultural resources. • Implementation of site avoidance, monitoring, data recovery, reduction of visual impacts, or other measures developed to mitigate adverse impacts.	C, O, D
Designated Areas with Wilderness Characteristics			
11	Unique/ important areas	Locating renewable energy facilities in areas of unique or important cultural, recreation, wildlife, or visual resources shall be avoided, even if they do not possess a special area designation.	S
Ecological			
12	Training	Develop a project-specific worker environmental awareness program (WEAP) that meets the approval of the permitting agencies and is carried out during all phases of the project (site mobilization, ground disturbance, grading, construction, operation, closure/decommissioning, or project abandonment, and restoration/reclamation	C, O, D

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
		activities). Identify in the WEAP biological resources and BMPs for minimizing impacts to resources. Provide interpretation for non-English speaking workers, and provide the same instruction for new workers prior to their working onsite. Keep in project field construction office files the names of onsite personnel (for example, surveyors, construction engineers, employees, contractors, contractor's employees, subcontractors) who have participated in the education program. At a minimum, include the following in the program: • Photos and habitat descriptions for special status species that may occur on the project site and information on their distribution, general behavior, and ecology. • Species sensitivity to human activities. • Legal protections afforded the species. • Project BMPs for protecting species. • State and federal law violation penalties. • Worker responsibilities for trash disposal and safe/humane treatment of wildlife and special status species found on the project site, associated reporting requirements, and specific required measures to prevent taking of threatened or endangered species. • Handout materials summarizing the contractual obligations and protective requirements specified in project permits and approvals. • Project site speed limit requirements and penalties.	
13	Construction	If needed, temporary access roads shall be developed primarily through the removal of woody vegetation, although temporary timber mats should be used in areas of wet soils. Wide-tracked or balloon-tired equipment, timber corduroy, or timber mat work areas shall be used on wet soils, where wetland or stream crossings are unavoidable and when crossing on frozen ground is not possible in winter.	C, O, D
14	Blasting	The occurrence of flyrock from blasting shall be limited by using blasting mats.	C, D
15	Traffic	Any vehicle-wildlife collisions or carrion shall be immediately reported to security or the on-site biological monitor. Observations of potential wildlife problems, including wildlife mortality, shall be immediately reported to the BLM or other appropriate agency authorized officer. Procedures for removal of wildlife carcasses on-site and along access roads shall be addressed in the Animal, Pest, and Vegetation Control Plan, to avoid vehicle-related mortality of carrion-eaters.	C, O, D
16	Lighting	Towers that require lighting for aviation safety shall comply with the USFWS communications tower guidance. Unless otherwise required by the Federal Aviation Administration (FAA), only white (preferable) or red strobe lights shall be used at night, and these shall be the minimum number and minimum intensity allowable by the FAA. The strobes should be on for a brief a period as possible and the time between strobe or flashes should be the longest possible. Synchronize strobes so that a strobe effect is achieved and towers are not constantly	S, C, O, D

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
		illuminated. The use of solid red or pulsating red warning lights at night shall be avoided. Current research indicates that solid or pulsating (beacon) red lights attract night-migrating birds at a much higher rate than white strobe lights. Red strobe lights have not yet been studied.	
17	Lighting	Keep lighting at operation and maintenance facilities and substations located within 0.5 mile of the turbines to the minimum required for meeting FAA guidelines, and safety and security needs.	S, C
18	Road construction	If the need for using surfacing, road sealant, soil bonding, and stabilizing agents on non-paved surfaces is determined use agents that have been shown to be non-toxic to wildlife and plants.	C, O, D
19	Cattle guards	If cattle guards are identified for the design for new roads, they shall be wildlife friendly. To the extent practicable, improvements shall be made to existing ways and trails that require cattle to pass through existing fences, fence-line gates, new gates, and standard wire gates alongside them.	S
20	Trenches	Because open trenches could impede the seasonal movements of large game animals and alter their distribution, they shall be backfilled as quickly as is possible. Open trenches could also entrap smaller animals; therefore, escape ramps shall be installed at regular intervals along open-trench segments at distances identified in the applicable land use plan or best available information and science. Additionally, an appropriate number of qualified biological monitors (as determined by the federal authorizing agency and the USFWS) shall be on-site to monitor, capture, and relocate animals that become entrapped in trenches and are unable to escape on their own.	C, O, D
21	Aquatic habitat	If transmission lines are located near aquatic habitats or riparian areas (e.g. minimum buffers identified in applicable land use plan or best available science and information), vegetation maintenance shall be limited and performed mechanically rather than with herbicides. Cutting in wetlands or stream and wetland buffers shall be conducted by hand or feller-bunchers. Tree cutting in stream buffers shall only target trees able to grow into a transmission line conductor clearance zone within 3 to 4 years. Cutting in such areas for construction or vegetation management shall be minimized, and the disturbance of soil and remaining vegetation shall be minimized.	S, C
22	Habitat	A habitat restoration plan shall be developed to avoid, minimize, or mitigate negative impacts on vulnerable wildlife while maintaining or enhancing habitat values for other species. The plan shall identify reclamation, soil stabilization, and erosion reduction measures that shall be implemented to ensure that all temporary use areas are restored. The plan shall require that restoration occur as soon as possible after completion of activities, provided such revegetation will not compromise the function of any buried utilities, to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats. Species salvaged during construction could be transplanted into these areas at a density similar to pre-construction conditions. Revegetation shall focus on the establishment of native plant communities similar to those present in the vicinity of the project site. Species used shall consist of native species dominant within the plant communities existing in adjacent areas having similar soil conditions. Certified weed-free seed mixes of native shrubs, grasses, and forbs of local origin shall be used. In areas where suitable native species are unavailable, other plant species approved by	S

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
		BLM could be used. The restoration plan shall include adaptive management and a monitoring plan. The monitoring plan will establish success thresholds.	
23	Wildlife	Meteorological towers and solar sensors shall be located to avoid sensitive habitats or areas where wildlife are known to be sensitive to human activities (e.g., sage grouse; refer to applicable land use plan or best available information and science to determine avoidance distances). Installation of these components shall be scheduled to avoid disruption of wildlife reproductive activities, migratory behaviors, or other important behaviors. The area disturbed by installation of meteorological towers (i.e., footprint) shall be kept to a minimum.	S, C
24	Wildlife timing	Activities shall be timed to avoid, minimize, or mitigate impacts on wildlife. For example, crucial winter ranges for elk, deer, pronghorn, and other species shall be avoided especially during their periods of use.	S, C, O, D
25	Birds/bats	Avian and bat use surveys consistent with current methodologies and standards shall be conducted; the amount and extent of ecological baseline data required shall be determined on a project basis.	S
26	Eagles	At the project level, recommendations contained in the Interim Golden Eagle Technical Guidance: Inventory and Monitoring Protocol; and Other Recommendations in Support of Golden Eagle Management and Permit Issuance (Pagel et al. 2010) shall be considered in project planning, as appropriate. Additionally, the Bald and Golden Eagle Protection Act–Golden Eagle National Environmental Policy Act and Avian Protection Plan Guidance for Renewable Energy (Instruction Memorandum No. 2010-156) will need to be adhered to until programmatic permits from the USFWS are available. This memorandum requires that consideration of golden eagles and their habitat be incorporated into site-specific NEPA analysis for all renewable energy projects and determine whether the project has the potential to affect golden eagles or their habitat. It must be determined whether breeding territories/nests, feeding areas, roosts, or other important golden eagle use areas are located within the analysis area. The analysis shall be made in coordination with the USFWS and AGFD. If the proposed project has the potential to affect golden eagles or their habitat, an analysis shall be completed that includes: (1) direct and indirect effects analysis; (2) cumulative effects analysis; (3) BMPs; (3) avian protection plans; (4) interagency coordination; and (5) record of decision, decision record, and notice to proceed.	S
27	Raptors	Operators shall determine the presence of active raptor nests (i.e., raptor nests used during the breeding season) and design the project to provide for spatial buffers and timing restrictions for surface disturbing activities. Operators shall coordinate with AGFD to help determine the appropriate survey methods. Measures to reduce raptor and/or raptor prey species use at a project site (e.g., minimize road cuts, maintain either no vegetation or plant species that are unattractive to raptors around the turbines) shall also be identified.	S
28	Special status species	The capability of local surface water or groundwater supplies to provide adequate water for operation of proposed solar facilities shall be considered early during project siting and design. Technologies that result in large withdrawals that affect water bodies that support ESA-listed species shall not be considered.	S

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
29	Desert tortoise	Ensure the biologist inspects construction pipes, culverts, or similar structures: (a) with a diameter greater than 3 inches, (b) stored for one or more nights, (c) less than 8 inches aboveground, and (d) within desert tortoise habitat (such as outside the permanently fenced area), before the materials are moved, buried, or capped. As an alternative, cap such materials before storing outside the fenced area or placing on pipe racks. Avoid inspection or capping if the materials are stored within the permanently fenced area after completing desert tortoise clearance surveys.	C, D
30	Cactus	As directed by the local BLM field office, Joshua trees (*Yucca brevifolia*), other Yucca species, and most agave and cactus species, shall be salvaged prior to land clearing, and transplanted, held for use in revegetating temporarily disturbed areas, or otherwise protected as prescribed by state or local BLM requirements.	C, O, D
31	Noxious weeds	An Integrated Vegetation Management Plan shall be developed that is consistent with applicable regulations and agency policies for the control of noxious weeds and invasive plant species. The plan shall address monitoring; ROW vegetation management; the use of certified weed-free seed and mulching; the cleaning of vehicles to avoid the introduction of invasive weeds; and the education of personnel on weed identification, the manner in which weeds spread, and the methods for treating infestations. The plan shall investigate possibilities of revegetating parts of the renewable energy project area. Where revegetation is accomplished, fire breaks shall be required such that vegetated areas would not result in increased fire hazard. For transmission line ROWs, the plan shall be consistent with the existing vegetation management plan for that ROW. Principles of integrated pest management, including biological controls, shall be used to prevent the spread of invasive species. The plan shall include periodic monitoring, reporting, and immediate eradication of noxious weed or invasive species occurring within all managed areas. A controlled inspection and cleaning area shall be established to visually inspect construction equipment arriving at the project area and to remove and collect seeds that may be adhering to tires and other equipment surfaces. To prevent the spread of invasive species, project developers shall work with the local BLM field office to determine whether a pre-activity survey is warranted, and if so, conduct the survey. If invasive plant species are present, project developers shall work with the local BLM field office to develop a control strategy. The plan shall include a post-construction monitoring element that incorporates adaptive management protocols.	S
32	Pesticide use	If pesticides are used on the site, an integrated pest management plan shall be developed to ensure that applications will be conducted within the framework of BLM and DOI policies and entail only the use of EPA-registered pesticides. Pesticide use shall be limited to nonpersistent, immobile pesticides and shall only be applied in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications. Any applications of herbicides will be subject to BLM herbicide treatment standard operating procedures. Only herbicides on the list of approved herbicide formulations (updated annually) will be used on public lands.	S, C, O, D
33	Fire	A Fire Management and Protection Plan shall be developed to implement measures to minimize the potential for a human-caused fire to affect ecological resources and respond to natural fire situations.	S

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
34	Waste	A Trash Abatement Plan shall be developed that focuses on containing trash and food in self-closing, sealable containers with lids that latch and empty them daily to reduce their attractiveness to opportunistic species, such as common ravens, coyotes, and feral dogs that could serve as predators on native wildlife and special status animals. Remove trash containers associated with construction from the project site when construction is complete.	S
35	Reclamation	A Decommissioning and Site Reclamation Plan specific to the project shall be developed and implemented. Baseline data shall be collected in each project area as a benchmark for measuring the success of reclamation efforts. The plan shall contain an adaptive management component that allows for the incorporation of lessons learned from monitoring data. The plan shall require that land surfaces be returned to pre-development contours to the greatest extent feasible immediately following decommissioning. The plan shall focus on the establishment of native plant communities similar to those present in the vicinity of the project site. The plan shall be designed to expedite the re-establishment of vegetation and require restoration to be completed as soon as practicable. To ensure rapid and successful re-establishment efforts, the plan shall specify site-specific measurable success criteria, including target dates, which shall be developed in coordination with the BLM and which shall be required to be met by the operator. Vegetation re-establishment efforts shall continue until all success criteria have been met. Bonding to cover the full cost of vegetation re-establishment shall be required. Species used for vegetation re-establishment shall consist of native species dominant within the plant communities existing in adjacent areas having similar soil conditions. The plan shall require the use of weed-free seed mixes of native shrubs, grasses, and forbs of local sources where available. When available, seed of known origin as labeled by state seed certification programs shall be used. Local native genotypes shall be used. If cultivars of native species are used, certified seed (i.e., blue tag) shall be used. "Source identified" seed (i.e., yellow tag) shall be used when native seed is collected from wildland sites. The cover, species composition, and diversity of the re-established plant community shall be similar to those in the vicinity of the site. In areas where suitable native species are unavailable, other plant species approved by the BLM could be used. If non-natives are necessary they shall be non-invasive, non-competitive, and ideally are short-lived, have low reproductive capabilities, or be self-pollinating to prevent gene flow into the native community. Non-natives used shall not exchange genetic material with common native plant species. The plan shall also include site-specific, measurable success criteria that must be met. The plan shall be developed in coordination with appropriate federal and state agencies.	S, D
36	Reclamation	Post-decommissioning protocols shall include monitoring for native vegetation recovery; invasive species colonization and spread; wildlife use; and special status species use. Monitoring data shall be used to determine the success of reclamation activities and the need for changes in ongoing management or for additional reclamation measures. Ongoing visual inspections for a minimum of 5 years following decommissioning activities shall be required to ensure adequate restoration and minimal environmental degradation. This period shall be extended until satisfactory results are obtained.	D

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
37	Mitigation/ monitoring	Prepare a project specific mitigation and monitoring plan in cooperation with and that meets the approval of permitting agencies and AGFD where applicable. Carry out the plan during all phases of the project to avoid, minimize, or mitigate adverse direct, indirect, and cumulative impacts, including habitat, special status plant, and wildlife species losses. Address at a minimum: • Biological resource mitigation, monitoring, and compliance measures required by federal, state, and local applicable permitting agencies. • Documentation (based on surveys) of sensitive plant and wildlife expected to be affected by all phases of the project (project construction, operation, abandonment, and decommissioning). Agencies may request additional surveying, based on the documentation or past experience working with the resources. Include measures to avoid or minimize impacts to species and habitat. • A detailed description of measures, including revegetation, soil stabilization, and erosion reduction measures, to minimize or mitigate permanent and temporary disturbances on vegetation, wildlife, and special status plants and animals from construction activities. The plan shall require that restoration occur as soon as possible after completion of activities to reduce the amount of habitat converted at any one time and to hasten the recovery to natural habitats. • Mitigation and monitoring unavoidable impacts on waters of the US, including wetlands. • Demonstration of compliance of the project with the regulatory requirements of the Bald and Golden Eagle Protection Act. The plan shall be developed in coordination with and permitted by the USFWS. • Measures to protect birds (including migratory species protected under the Migratory Bird Treaty Act) developed in coordination with and permitted by the appropriate federal and state agencies (e.g. BLM, USFWS, and state resource management agencies). • Measures to mitigate and monitor impacts on special status species developed in coordination with and permitted by the appropriate federal and state agencies (e.g. BLM, USFWS, and state resource management agencies). • Monitoring the potential for increase in predation of special status species (especially desert tortoise) from ravens and other species that are attracted to developed areas and opportunistically use tall structures to spot vulnerable prey. • Clearing and translocation of special status species, including the steps to implement the translocation as well as the follow-up monitoring of populations in the receptor locations, as determined in coordination with the appropriate federal and state agencies. The need for a Special Status Species Clearance and Translocation Plan shall be determined on a project-specific basis.	S

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
		• All locations on a map, at an approved scale, of sensitive plant and wildlife areas subject to disturbance and areas requiring temporary protection and avoidance during construction. • Aerial photographs or images, at an approved scale, of areas to be disturbed during project construction activities. • Duration for each type of monitoring and a description of monitoring methodologies and frequency. • Performance standards, thresholds, monitoring, and criteria to be used to determine if/when proposed mitigation is or is not successful. • All standards and remedial measures to be implemented if performance standards and criteria are not met. • Adaptive management strategies. • A closure/decommissioning or abandonment plan, including a description of funding mechanism(s).	
38	Monitoring	Designate a qualified biologist (approved by the BLM) responsible for overseeing compliance with biological resources BMPs and project-specific mitigation measures during mobilization, ground disturbance, grading, construction, operation, and closure/decommissioning, or project abandonment, particularly in areas containing or known to have contained sensitive biological resources, such as special status species and unique plant assemblages. Additional qualified biological monitors may be required on-site during all project phases as determined by the authorizing federal agency. It is suggested that the qualified biologist be responsible for actions including, but not limited to, the following: • Clearly marking sensitive biological resource areas and inspecting the areas at appropriate intervals for meeting regulatory terms and conditions. • Inspecting, daily, active construction areas where wildlife may have become trapped (for example, trenches, bores, and other excavation sites that constitute wildlife pitfalls outside the permanently fenced area) before beginning construction. At the end of the day, conducting wildlife inspections of installed structures that would entrap or not allow escape during periods of construction inactivity. Periodically inspecting areas with high vehicle activity (such as parking lots) for wildlife in harm's way. • Overseeing cactus, agave, and yucca salvage operations. • Immediately recording and reporting hazardous spills immediately as directed in the project hazardous materials management plan. • Coordinating directly and regularly with permitting agency representatives regarding biological resources issues, including biological resource BMP implementation. • Maintaining written records regarding implementation of biological resource BMPs and providing a summary of these records periodically in a report to the appropriate agencies.	C, O, D

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
		• Notifying the project owner and appropriate agencies of non-compliance with biological resources BMPs.	
Hazardous Materials			
39	Phase I surveys	For projects proposed on previously disturbed or developed lands, conduct a Phase I site assessment (American Society for Testing and Materials Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (ASTM E1527) or other equivalent assessment method deemed acceptable by the appropriate regulatory oversight agency) for the project site and linear appurtenances. If Phase I identifies environmental conditions, concerns, or data gaps requiring additional site assessment to adequately characterize the site, conduct additional site assessment work (such as Phase 2) with appropriate regulatory agency oversight. Provide the Phase I, and if conducted, the Phase 2 site assessment with applications to appropriate lead agencies.	S
40	Hazardous materials/ waste plan	A Construction and Operation Waste Management Plan shall identify the waste streams that are expected to be generated at the site and addresses hazardous waste determination procedures, waste storage locations, waste-specific management and disposal requirements, inspection procedures, and waste minimization procedures. The plan shall address all solid and liquid wastes that may be generated at the site in compliance with the CWA requirements to obtain the project's NPDES permit.	S, C, O, D
41	Hazardous materials	All hazardous materials and vehicle/equipment fuels shall be transported, stored, managed, and disposed in accordance with accepted BMPs and in compliance with all applicable regulations and the requirements of approved plans, including, where applicable, a Stormwater Management Plan, a Spill Prevention and Emergency Response Plan, and a Hazardous Materials and Waste Management Plan.	C, O, D
42	Hazardous materials	Systems containing hazardous materials shall be designed and operated in a manner that limits the potential for hazardous materials release, constructed of compatible materials, and in good condition (as verified by periodic inspections), including provision of secondary containment features (to the extent practical); installation of sensors or other devices to monitor system integrity; installation of strategically placed valves to isolate damaged portions and limit the amount of hazardous materials in jeopardy of release; and robust inspection and repair procedures.	S, C, O, D
43	Hazardous materials storage	Secondary containment shall be provided for all onsite hazardous materials and waste storage, including fuel. In particular, fuel storage (for construction vehicles and equipment) shall be a temporary activity occurring only for as long as is needed to support construction activities.	C, O, D
44	Herbicide/ pesticide use	An Animal, Pest, and Vegetation Control Plan shall be developed to ensure that applications are conducted within the framework of BLM and DOI policies and standard operating procedures and entail only the use of EPA-registered pesticides/herbicides that also comply with state and local regulations.	C, O, D
45	Herbicide/ pesticide use	Use appropriate herbicide-free/pesticide-free buffer zones for herbicides not labeled for aquatic use, based on permitting agency or BLM/U.S. Forest Service risk assessment guidance. The federal guidance suggests minimum widths of 100 feet for aerial applications, 25 feet for applications dispersed by vehicle and 10 feet for hand spray	C, O, D

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
		applications.	
46	Fire	A Fire Management and Protection Plan shall be developed to implement measures to minimize the potential for fires associated with substances used and stored at the site. The flammability of the specific heat transfer fluid (HTF) used at the facility shall be considered.	S, C, O, D
47	Spills	A comprehensive Spill Prevention and Emergency Response Plan shall be developed for the facility that meets the following criteria: is written, periodically updated, and made available to the entire workforce; contains procedures for timely notification of appropriate authorities, including the designated BLM land manager; provides spill/emergency contingency planning for each type of hazardous material present, including abatement or stabilizing of release, recovery of spilled product, and remediation of impacted environmental media; is supported by the strategic deployment of appropriate spill response materials and equipment, including PPE for individuals with spill or emergency response assignments; provides for prompt response to spills and timely delivery of recovered spill materials and contaminated environmental media to appropriately permitted off-site treatment or disposal facilities; formally assigns spill and emergency response duties to specified individuals; provides and documents appropriate training to individuals with spill or emergency response assignments; provides for the prompt response to spills and timely delivery of recovered spill materials and contaminated environmental media to appropriately permitted off-site treatment or disposal facilities; provides general awareness training to remaining facility personnel; and provides for written documentation of each event, including root cause analysis, corrective actions taken, and a characterization of the resulting environmental or health and safety impacts.	S, C, O, D
48	Contaminated soils	If any newly found potentially contaminated soils are discovered, contractors will stop work immediately in that area and notify the project proponent, BLM, and Arizona Department Environmental Quality of the discovery and coordinate for any excavation and disposal of the soil.	C, O, D
Health and Safety			
49	Health and safety	A health and safety program shall be developed to protect workers during site characterization, construction, operation, and decommissioning of a renewable energy project. The program shall identify all applicable federal and state occupational safety standards and establish safe work practices addressing all hazards, including requirements for developing the following plans: general injury prevention; personal protective equipment (PPE) requirements and training; respiratory protection; hearing conservation; electrical safety; hazardous materials safety and communication; housekeeping and material handling; confined space entry; hand and portable power tool use; gas-filled equipment use; and rescue response and emergency medical support, including on-site first-aid capability.	S
50	Health	If operation of the solar and/or wind facility and associated transmission lines and substations is expected to cause potential adverse impacts on nearby residences and occupied buildings from noise, sun reflection, flicker, or electromagnetic fields, recommendations for addressing these concerns shall be incorporated into the project	O

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
		design (e.g., establishing a sufficient setback from transmission lines).	
51	Safety	The health and safety program shall address OSHA standard practices for the safe use of explosives and blasting agents (e.g., if used to construct foundations for power tower facilities); measures for reducing occupational EMF exposures; the establishment of fire safety evacuation procedures; and required safety performance standards (e.g., electrical system standards and lighting protection standards). The program shall include training requirements for applicable tasks for workers and establish procedures for providing required training to all workers. Documentation of training and a mechanism for reporting serious accidents to appropriate agencies shall be established.	S, C, O, D
52	EMI	Design the project to reduce electromagnetic interference (EMI) (for example, impacts to radar, microwave, television, and radio transmissions) and comply with Federal Communications Commission (FCC) regulations. Conduct signal strength studies when proposed locations have the potential to affect FCC licensed transmissions. Reduce to nil potential or real interference with public safety communication systems (for example, radio traffic related to emergency activities) or the amateur radio bands.	S
53	EMI	In the event an installed wind energy development project results in electromagnetic interference (EMI), the operator shall work with the owner of the impacted communications system to resolve the problem. Additional warning information may also need to be conveyed to aircraft with onboard radar systems so that echoes from wind turbines can be quickly recognized.	O
54	Traffic	A Traffic Management Plan shall be prepared for the site access roads to control hazards that could result from increased truck traffic (most likely during construction or decommissioning), to ensure that traffic flow will not be adversely affected and that specific issues of concern (e.g., the locations of school bus routes and stops) are identified and addressed. This plan shall incorporate measures such as informational signs, flaggers when equipment may result in blocked throughways, and traffic cones to identify any necessary changes in temporary lane configuration. The plan shall be developed in coordination with local planning authorities.	S, C, O, D
55	Meteorological towers	Meteorological towers installed for site monitoring and testing shall be inspected periodically (at least every 6 months) for structural integrity.	S
56	Glare	For parabolic trough facilities, an evaluation of the potential exposure of the public to glare from parabolic trough mirrors shall be conducted. If there is a potential for exposure at levels that could cause retinal damage, measures to eliminate the exposure shall be implemented (e.g., slatted fencing to shield views from outside the facility).	S
57	Glare	A Heliostat Positioning Plan shall be prepared for power tower projects to avoid exposures to reflected sunlight that could cause retinal damage, temporary blindness, or distraction to operators of aircraft or motorized vehicles on roads in the vicinity of facilities.	S
58	Glare	Parabolic trough and power tower facilities shall develop a Glare Monitoring Plan to log, investigate, and respond to complaints about glare, either from heliostats or from the tower receivers.	S, O

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
59	Glare	For power tower facilities, the hazards associated with the tower and the glare from the heliostat mirrors shall be evaluated through coordination with local airports and evaluation of flight paths.	S, O
60	SF6	Because of the high global warming potential of SF6, the use of alternative dielectric fluids shall be considered. Alternatively, regular leak detection inspections shall be required to minimize the occurrence and impacts of SF6 leaks from facility piping.	S
61	Fire	Operators shall develop a Fire Management and Protection Plan to implement measures to minimize the potential for a human-caused fire and to respond to human-caused or natural-caused fires. Carry out the plan during all phases of project development. Train site workers to respond, as appropriate, to fires. Maintain a 30-foot firebreak within the fenced area containing project facilities.	S
Lands and Realty			
62	Interconnections	In applications to appropriate lead agencies, provide a copy of the electric transmission interconnection study from the appropriate control agency. Include in the interconnection study an identification of the transmission impacts beyond the first point of interconnection and acceptable measures to mitigate/alleviate impacts to the transmission network system. When more than one alternative mitigation measure is identified, indicate in the applications the measure selected by the project developer. Provide for each selected mitigation measure, an environmental analysis sufficient to meet the CEQA requirements for indirect project impacts.	S
63	Decommissioning	Inoperative turbines shall be repaired, replaced, or removed in a timely manner. Requirements to do so shall be incorporated into the due diligence provisions of the rights-of-way authorization. Operators will be required to demonstrate due diligence in the repair, replacement, or removal of turbines; failure to do so may result in termination of the right-of-way authorization.	D
Native American Concerns			
64	Burial sites	Tribal burial sites shall be avoided. If avoidance is not possible, consultation with the lineal descendants or Tribal affiliates of the deceased shall be undertaken before removing a known burial. Remains and objects s shall be protected and their treatment and disposition determined according to NAGPRA statutory procedures and regulations. A contingency plan for encountering unanticipated burials and funerary goods during construction, maintenance, or operation of a renewable energy facility shall be developed as part of a formalized agreement to address management and mitigation options for significant cultural resources (see Cultural Resources) in consultation with the appropriate Tribal governments and cultural authorities well in advance of any ground disturbances.	S
65	Archaeology	Archaeological sites created by ancestral Native American populations shall be avoided whenever possible. However, when archaeological excavations are necessary, affiliated Tribe(s) shall be consulted in developing research designs and data recovery plans. Possible mitigations include scientific excavation; monitoring or participation in excavations by Tribal representatives; or approved curation of collections in tribal facilities that meet government standards to ensure appropriate preservation and management.	S, C, O, D

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
Noise - Vibration			
66	Equipment	Adhere to applicable wind turbine national or international acoustic design standards (for example, International Energy Agency, International Electrotechnical Commission, and the American National Standards Institute).	S
67	Monitoring/ mitigation	Prepare a noise monitoring and mitigation plan. Design the project to: minimize noise impacts to sensitive noise receptors, limit increases to less than a five to 10 dBA increase above ambient levels, and not exceed local noise standards. Address project generated noise impacts as much as possible. Consider acquiring lands to serve as buffers around the proposed facilities.	S
Paleontology			
68	Mitigation	The Paleontological Resources Management Plan shall include a mitigation plan; mitigation may include avoidance, removal of fossils (data recovery), stabilization, monitoring, protective barriers and signs, or other physical or administrative protection measures. The Paleontological Resources Management Plan also shall identify measures to prevent potential looting, vandalism, or erosion impacts and address the education of workers and the public to make them aware of the consequences of unauthorized collection of fossils on public land.	S
Soils			
69	Geotechnical	Ground-disturbing geotechnical studies (e.g., geotechnical drilling) shall adhere to the permitting requirements specified by the BLM in 43 CFR 2920.	S, C
70	Disturbance area	Existing roads, disturbed areas, and borrow pits shall be used. If new roads are necessary, they shall be designed and constructed to the appropriate road design standards, such as those described in BLM Manual 9113. The specifications and codes developed by the US Department of Transportation (DOT) are also to be taken into account.	S, C, O, D
71	Roads	New roads shall be designed to follow natural land contours and avoid or minimize hill cuts in the project area and avoid existing desert washes. Siting of new roads and walking trails (if any) is to be consistent with the designation criteria specified by the BLM in 43 CFR 8342.1.	S
72	Roads	Temporary roads shall be designed with eventual reclamation in mind.	S
Transportation			
73	Easements/ encroachments	Obtain encroachment permits from appropriate agencies.	C, O, D
74	Transportation plans	An access road siting and management plan shall be prepared incorporating existing BLM standards regarding road design, construction, and maintenance such as those described in the BLM 9113 Manual and the Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (revised 2007).	S
75	Transportation plans	A transportation plan shall be developed, particularly for the transport of turbine components, main assembly cranes, and other large pieces of equipment. The plan shall consider specific object sizes, weights, origin,	S

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
		destination, and unique handling requirements and shall evaluate alternative transportation approaches. In addition, the process to be used to comply with unique state requirements and to obtain all necessary permits shall be clearly identified.	
76	Design	Existing roads shall be used, but only if in safe and environmentally sound locations. If new roads are necessary, they shall be designed and constructed to the appropriate BLM road design standards and be no higher than necessary to accommodate their intended functions (e.g., traffic volume and weight of vehicles). Excessive grades on roads, road embankments, ditches, and drainages shall be avoided, especially in areas with erodible soils. Special construction techniques shall be used, where applicable. Abandoned roads and roads that are no longer needed shall be recontoured and revegetated.	S, C, O, D
Visual Resources			
77	VRM	Facilities proposed within the foreground/middleground distance zone (0 to 5 mi [0 to 8 km]) of National Scenic Highways and All-American Roads shall include measures to minimize the profile of all structures related to the facility so that the viewshed from the scenic highway meets VRM objectives. The project developer shall evaluate the potential visual impacts on National Scenic Highways and All-American Roads associated with the proposed project and identify appropriate mitigation measures for inclusion as stipulations in the Plan of Development.	S
78	Design	Project developers shall exhaust opportunities of projects to be sited outside the viewsheds of KOPs, or if facilities must be sited within view of KOPs then they shall be sited as far away as possible, since visual impacts generally diminish as viewing distance increases.	S
79	Special areas	Specific to national historic trails (NHTs), but possibly pertaining to other special designations, National Parks (NPs) and National Wildlife Refuges (NWRs): • For applications that include remnants of a National Historic Trail, are located within the viewshed of a National Historic Trail's designated centerline, or include or are within the viewshed of a trail eligible for listing in the NRHP by virtue of its integrity of setting and feeling, the applicant shall evaluate the potential visual impacts on the trail, minimize, avoid, or mitigate adverse effects, and identify appropriate mitigation measures as stipulations in the Plan of Development (see also Cultural Resources). • Because the landscape setting observed from national historic sites, national trails, and Tribal cultural resources may be a part of the historic context contributing to the historic significance of the site or trail, project siting project siting will strive to avoid locating facilities that alter the visual setting such that they reduce the historic significance or function.	S, C, O, D

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
80	Lighting	A Lighting Plan shall be prepared that documents how lighting will be designed and installed to minimize night-sky impacts during facility construction and operations phases. Lighting for facilities shall not exceed the minimum number of lights and brightness required for safety and security and shall not cause excessive reflected glare. Full cut-off luminaires shall be utilized to minimize uplighting. Lights shall be directed downward or toward the area to be illuminated. Light fixtures shall not spill light beyond the project boundary. Lights in high-illumination areas not occupied on a continuous basis shall have switches, timer switches, or motion detectors so that the lights operate only when the area is occupied. Where feasible, vehicle-mounted lights shall be used for night maintenance activities. Wherever feasible, consistent with safety and security, lighting shall be kept off when not in use. The Lighting Plan shall include a process for promptly addressing and mitigating complaints about potential lighting impacts.	S, C, O
81	Glare	A study to assess accurately and to quantify potential glinting and glare effects and to determine potential health, safety, and visual impacts associated with glinting and glare effects shall be conducted by qualified individuals using appropriate and commonly accepted software and procedures. The study results must be made available to the BLM in advance of project approval. If the project design is changed during the siting and design process such that substantial changes to glinting and glare effects may occur, glinting and glare effects shall be recalculated, and the study results made available to the BLM.	S
82	Glare	Commercial symbols or signs and associated lighting on buildings or other structures shall be prohibited.	S, C, O
Water Resources			
83	Groundwater	Project developers who plan to use groundwater shall develop and implement a groundwater Water Resources Monitoring and Mitigation Plan, which includes monitoring the effects of groundwater withdrawal for project uses, vegetation restoration and dust control uses during decommissioning and aquifer recovery after project decommissioning. Monitoring frequency shall be decided on a site-specific basis and in coordination with federal, state, and local agencies managing groundwater resources of the region.	S, C, O, D
84	Groundwater	If groundwater use is proposed, project developers shall ensure that a comprehensive analysis of the groundwater basin is provided and that the following potential significant impacts are evaluated: • Creation or exacerbation of overdraft conditions and their potential to cause subsidence and loss of aquifer storage capacity; • Use that cause injury to other water rights claims in the basin; • Estimates of the total cone of depression considering cumulative drawdown from all potential pumping in the basin, including the project, for the life of the project through the decommissioning phase; • Changes in water quality that affect other beneficial use; and • Effects on groundwater dependent ecosystems such as springs, seeps, and wetlands that provide water for plants and animals.	S

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
85	Groundwater	Groundwater wells constructed during any stage of the project will conform to state and local standards and records shall include: • Legal description (township, range, section, and quarter section);Project map with proposed and existing well locations; • Well design characteristics: casing diameter, screened interval(s), well depth, and static water level; • Results of groundwater pumping tests or other tests done in the well; and • Anticipated pumping capacity and peak pumping rates. For groundwater wells located outside of an AMA or for industrial users within an AMA, the following are not required by ADWR, but are sitting requirements for the BLM: • Identification of the groundwater aquifer and its hydrogeologic characteristics; • Estimation of the potential cone of depression that might be produced by the proposed pumping throughout the lifetime of a project by using an analytical or numerical model; and • Estimate of the total cone of depression considering cumulative drawdown from all potential pumping in the basin, including the project, for the life of the project through the decommissioning phase (also using an analytical or numerical model).	S
86	Surface water	Project developers who plan to use surface water sources shall develop a Water Resources Monitoring and Mitigation Plan that includes monitoring changes in flows, volumes, and water quality during construction and operations, as well as their recovery during decommissioning. Monitoring frequency shall be decided on a site-specific basis and in coordination with federal, state, and local agencies managing surface water resources of the region.	S
87	Water quality	No project and/or project related activities shall degrade, negatively effect, and/or contribute to impairment of existing surface water quality conditions for waterbodies that are Federally designated on the CWA section 303(d) list of impaired surface waters and existing water quality shall be maintained and protected in a surface water that is classified as an Outstanding Arizona Water (OAW) under Arizona Administrative Code R18-11-112 or designated Arizona's Outstanding Natural Resource Waters.	C, O, D
88	Water quality	When an herbicide/pesticide is used to control vegetation, the climate, soil type, slope, and vegetation type shall be considered in determining the risk of herbicide/pesticide contamination. Additionally, an Animal, Pest, and Vegetation Control Plan shall be developed to ensure that applications are conducted within the framework of BLM and DOI policies and standard operating procedures and entail only the use of EPA-registered pesticides/herbicides that also comply with state and local regulations.	C, O, D

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
89	Flooding	Projects developers shall maintain the pre-development flood hydrograph for all storms up to and including the 100-yr rainfall event. All stormwater retention and/or infiltration and treatment systems shall also be designed for all storms up to and including the 100-yr storm event. As part of a Spill Prevention and Emergency Response Plan, measures to prevent potential groundwater and surface water contamination shall be identified.	S, C, O, D
90	Hydrology	Developers shall be required to conduct a detailed hydrologic study demonstrating a clear understanding of the local surface water and groundwater hydrology. At a minimum this hydrologic study shall include: • Quantification of physical characteristics describing surface water features, such as streamflow rates, stream cross-sections, channel routings, seasonal flow rates (intermittent streams), peak flow rates (ephemeral washes/drainages), sediment characteristics and transport rates, lake depths, and surface areas of lakes, wetlands, and floodplains; • Hydrologic analysis and modeling to define the 100-yr, 24-hour rainfall event for the project area and calculation of projected runoff from this storm at site; • Hydrologic analysis and modeling to identify 100-yr floodplain boundaries of any surface water feature on the site; • Quantification of physical characteristics describing the groundwater aquifer, such as physical dimensions of the aquifer, sediment characteristics, confined/unconfined conditions, hydraulic conductivity and transmissivity distribution of the aquifer, groundwater surface elevations, and groundwater flow processes (direction, recharge/discharge, current basin extractions, and surface water-groundwater connectivity); • Quantification of regional climate including seasonal and long-term information on temperatures, precipitation, evaporation, and evapotranspiration; and • Quantification of the sustainable yield of surface waters and groundwater available to the project. Project developers shall evaluate the water sources in terms of existing water rights and management plans for adequacy to serve project demands while maintaining aquatic, riparian, and other water-dependent resources.	S
91	Wastewater	Developers shall coordinate with state/local regulatory agencies regarding the issuance of permits or "will-serve" agreements for development and use of water, and/or the operation of on-site wastewater treatment systems.	S, O
92	Stormwater	The facility shall obtain and comply with a construction stormwater permit through the EPA or state-run NPDES program (whichever applies within the state). Additionally, the EPA requires any development larger than 20 acres (0/08 km2) begun after August 2011 to comply with a requirement to monitor construction discharges for turbidity concentrations.	S, C, O, D
93	Mitigation	The Project Proponent will compensate for the loss of ephemeral drainage habitat through in-kind habitat	C

Table B-1 *(continued)*
Design Features

No.	Topic	Description of Measure	Phase
		restoration of a portion of the main drainage at a minimum ratio of 2:1. Restoration components may include removal of accumulated sediment, bank stabilization, planting of vegetation, sediment control measures, establishing protective habitat buffers, placing a conservation easement over the restored drainage and buffer, and funding an endowment that will provide for long-term management.	
94	Mitigation	A Drainage, Erosion, and Sedimentation Control Plan shall be developed that ensures protection of water quality and soil resources, demonstrates no increase in off-site flooding potential, and includes provisions for stormwater and sediment retention on the project site. The plan will identify site surface water runoff patterns and develop mitigation measures that prevent excessive and unnatural soil deposition and erosion throughout and downslope of the project site and project-related construction areas. The plan will achieve the following: • Runoff from parking lots, roofs, or other impervious surfaces will be directed to the immediate landscape or to retention basins prior to being released downgradient of the site. • Any landscaping used for stormwater treatment shall not be an invasive species and preferably a native species and would require little or no irrigation and would be recessed to create retention basins/areas used to capture runoff. • The amount of area covered by impervious surfaces will be reduced through the use of permeable pavement or other pervious surfaces. • Natural drainages and a pre-project hydrograph will be maintained for the area. Siting in identified 100-yr floodplains shall not be allowed within the development.	S, C, D
Wildfire			
95	Noxious weeds	A vegetation plan designed to prevent the establishment of non-native, invasive species on the solar energy facility and along transmission line ROWs and roads shall be developed and implemented to minimize the potential for increasing wildland fire frequency.	S, C, O, D

Table B-2
Required Plans

Construction, Operation, and Maintenance Plan	Applicants are required to prepare a Construction, Operations, and Maintenance (COM) Plan that incorporates the stipulations and conditions of each agency. The COM Plan will provide information on the project's design, construction, operation and maintenance, and environmental mitigation measures that will be used and implemented by construction contractors and personnel.
Access Road Siting and Management Plan	An access road siting and management plan shall be prepared incorporating existing BLM standards regarding road design, construction, and maintenance such as those described in the BLM 9113 Manual and the Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (revised 2007).
Compensatory Wetland Mitigation and Monitoring Plan	Compensatory Wetland Mitigation and Monitoring Plan (CWMMP) describes the mitigation of potential impacts to wetlands that would result from a proposed project. The proposed mitigation measures set forth in this Plan are intended to compensate for project impacts. The proposed compensatory mitigation measures described in this Plan address the direct, indirect, and cumulative impacts associated with a proposed project. The overall objective of the CWMMP is to ensure that there will be no net loss of wetland function or area.
Decommissioning and Site Reclamation Plan (Solar ROD and IM 2009-043)	Prior to the termination of the right-of-way authorization, a decommissioning plan shall be developed and approved by the BLM. The decommissioning plan shall include a site reclamation plan and monitoring program. A Decommissioning and Site Reclamation Plan specific to the project shall be developed and implemented. Baseline data shall be collected in each project area as a benchmark for measuring the success of reclamation efforts. The plan shall contain an adaptive management component that allows for the incorporation of lessons learned from monitoring data. The plan shall require that land surfaces be returned to pre-development contours to the greatest extent feasible immediately following decommissioning. The plan shall focus on the establishment of native plant communities similar to those present in the vicinity of the project site. The plan shall be designed to expedite the re-establishment of vegetation and require restoration to be completed as soon as practicable. To ensure rapid and successful re-establishment efforts, the plan shall specify site-specific measurable success criteria, including target dates, which shall be developed in coordination with the BLM and which shall be required to be met by the operator. Vegetation re-establishment efforts shall continue until all success criteria have been met. Bonding to cover the full cost of vegetation re-establishment shall be required. Species used for vegetation re-establishment shall consist of native species dominant within the plant communities existing in adjacent areas having similar soil conditions. The plan shall require the use of weed-free seed mixes of native shrubs, grasses, and forbs of local sources where available. When available, seed of known origin as labeled by state seed certification programs shall be used. Local native genotypes shall be used. If cultivars of native species are used, certified seed (i.e., blue tag) shall be used. "Source identified" seed (i.e., yellow tag) shall be used when native seed is collected from wildland sites. The cover, species composition, and diversity of the re-established plant community shall be similar to those in the vicinity of the site. In areas where suitable native species are unavailable, other plant species approved by the BLM could be used. If non-natives are necessary they shall be non-invasive, non-competitive, and ideally are short-lived, have low reproductive capabilities, or be self-pollinating to prevent gene flow into the native community. Non-natives used shall not exchange genetic material with common native plant species. The plan shall also include site-specific, measurable success criteria that must be met. The plan shall be developed in coordination with appropriate federal and state agencies.

Table B-2 *(continued)*
Required Plans

	The plan shall require that all above ground and near-ground structures be removed. Some structures shall be removed only to a level below the ground surface that will allow reclamation/restoration. Topsoil from all decommissioning activities shall be salvaged and reapplied during final reclamation. The plan shall include provisions for monitoring and determining compliance with the project's visual mitigation and reclamation objectives. Reclamation of the construction site shall begin immediately after construction to reduce the likelihood of visual contrasts associated with erosion and invasive weed infestation and to reduce the visibility of affected areas as quickly as possible.
Drainage, Erosion and Sedimentation Control Plan	A Drainage, Erosion, and Sedimentation Control Plan shall be developed that ensures protection of water quality and soil resources, demonstrates no increase in off-site flooding potential, and includes provisions for stormwater and sediment retention on the project site. The plan will identify site surface water runoff patterns and develop mitigation measures that prevent excessive and unnatural soil deposition and erosion throughout and downslope of the project site and project-related construction areas. The plan will achieve the following: • Runoff from parking lots, roofs, or other impervious surfaces will be directed to the immediate landscape or to retention basins prior to being released downgradient of the site • Any landscaping used for stormwater treatment will require little or no irrigation and will be recessed to create retention basins/areas used to capture runoff • The amount of area covered by impervious surfaces will be reduced through the use of permeable pavement or other pervious surfaces • Natural drainages and a pre-project hydrograph will be maintained for the area
Dust Abatement Plan	Plants, wildlife, and their habitats shall be protected from fugitive dust through measures included in the facility's Dust Abatement Plan.
Ecological Resources Mitigation and Monitoring Plan	A vegetation plan designed to prevent the establishment of non-native, invasive species on the solar energy facility and along transmission line ROWs and roads shall be developed and implemented to minimize the potential for increasing wildland fire frequency An Ecological Resources Mitigation and Monitoring Plan shall be developed to avoid, minimize, or mitigate adverse impacts on important ecological resources. The plan shall include but not necessarily be limited to the following elements: • Revegetation, soil stabilization, and erosion reduction measures that shall be implemented to ensure that all temporary use areas are restored. The plan shall require that restoration occur as soon as possible after completion of activities to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats. • Mitigation and monitoring unavoidable impacts on waters of the United States, including wetlands. • Compensatory mitigation and monitoring for significant direct, indirect, and cumulative impacts on and loss of habitat for special status plant and animal species. • Demonstration of compliance of the project with the regulatory requirements of the Bald and Golden Eagle Protection Act. The plan shall be developed in coordination with and permitted by the USFWS. • Measures to protect birds (including migratory species protected under the Migratory Bird Treaty Act) developed in coordination with and permitted by the

Table B-2 *(continued)*
Required Plans

appropriate federal and state agencies (e.g., BLM, USFWS, and state resource management agencies).

- Measures to mitigate and monitor impacts on special status species developed in coordination with and permitted by the appropriate federal and state agencies (e.g., BLM, USFWS, and state resource management agencies)
- Monitoring the potential for increase in predation of special status species (especially desert tortoise) from ravens and other species that are attracted to developed areas and opportunistically use tall structures to spot vulnerable prey.
- Clearing and translocation of special status species, including the steps to implement the translocation as well as the follow-up monitoring of populations in the receptor locations, as determined in coordination with the appropriate federal and state agencies. The need for a Special Status Species Clearance and Translocation Plan shall be determined on a project-specific basis
- Prepare a project specific ecological mitigation and monitoring plan in cooperation with and that meets the approval of permitting agencies. Carry out the plan during all phases of the project and, in general, identify appropriate mitigation levels to compensate for significant direct, indirect, and cumulative impacts, including habitat, special status plant, and wildlife species losses. Address at a minimum:
  - Biological resource mitigation, monitoring, and compliance measures required by federal, state, and local applicable permitting agencies.
  - Documentation (based on surveys) of sensitive plant and wildlife expected to be affected by all phases of the project (project construction, operation, abandonment, and decommissioning). Agencies may request additional surveying, based on the documentation or past experience working with the resources. Include measures to avoid or minimize impacts to species and habitat.
  - A detailed description of measures to minimize or mitigate permanent and temporary disturbances from construction activities.
  - All locations on a map, at an approved scale, of sensitive plant and wildlife areas subject to disturbance and areas requiring temporary protection and avoidance during construction.
  - Aerial photographs or images, at an approved scale, of areas to be disturbed during project construction activities.
  - Duration for each type of monitoring and a description of monitoring methodologies and frequency.
  - Performance standards and criteria to be used to determine if/when proposed mitigation is or is not successful.
  - All standards and remedial measures to be implemented in a timeframe to be determined by BLM if performance standards and criteria are not met.
  - A closure/decommissioning or abandonment plan, including a description of funding mechanism(s).

Table B-2 *(continued)*
Required Plans

Fire Management and Protection Plan	A Fire Management and Protection Plan shall be developed to implement measures to minimize the potential for a human-caused fire to affect ecological resources and respond to natural fire situations. A Fire Management and Protection Plan shall be developed to implement measures to minimize the potential for fires associated with substances used and stored at the site. The flammability of the specific HTF used at the facility shall be considered. Operators shall develop a Fire Management and Protection Plan to implement measures to minimize the potential for a human-caused fire and to respond to human-caused or natural-caused fires. Carry out the plan during all phases of project development. Train site workers to respond, as appropriate, to fires. Maintain a 30-foot firebreak within the fenced area containing project facilities.
Glint and Glare Assessment, Mitigation and Monitoring Plan	A study to assess accurately and to quantify potential glinting and glare effects and to determine potential health, safety, and visual impacts associated with glinting and glare effects shall be conducted by qualified individuals using appropriate and commonly accepted software and procedures. The study results must be made available to the BLM in advance of project approval. If the project design is changed during the siting and design process such that substantial changes to glinting and glare effects may occur, glinting and glare effects shall be recalculated, and the study results made available to the BLM. Parabolic trough and power tower facilities shall develop a Glare Monitoring Plan to log, investigate, and respond to complaints about glare, either from heliostats or from the tower receivers.
Habitat Restoration and Management Plan (Solar ROD and IM 2009-043)	A habitat restoration plan shall be developed to avoid, minimize, or mitigate negative impacts on vulnerable wildlife while maintaining or enhancing habitat values for other species. The plan shall identify reclamation, soil stabilization, and erosion reduction measures that shall be implemented to ensure that all temporary use areas are restored. The plan shall require that restoration occur as soon as possible after completion of activities to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats.
Heliostat Positioning Plan	A Heliostat Positioning Plan shall be prepared for power tower projects to avoid exposures to reflected sunlight that could cause retinal damage, temporary blindness, or distraction to operators of aircraft or motorized vehicles on roads in the vicinity of facilities. The plan should also avoid use of "standby points" (i.e., focal points away from the receiver vessel when all mirrors are not needed and some are in standby mode), but rather keep reflected beams dispersed to avoid impacts to birds through incineration.
Historic Properties Treatment Plan	Retain a qualified cultural resources specialist to write and carry out a monitoring and mitigation plan or agreement, when applicable, and to be available if cultural resources are encountered during construction. Avoidance of known cultural resources is generally the preferred resolution option; include in the plan measures to protect avoided resources during construction and to prevent looting/vandalism and erosion. If project impacts to known NRHP-eligible cultural resources are unavoidable, data recovery may be requested; include a data recovery strategy in the plan. The project developer may also be asked by the appropriate lead agency to include additional measures for addressing the discovery of previously unknown cultural resources during construction. Consider the following measures, at a minimum: • Hire a qualified archaeological monitor to oversee project excavations. • Develop and use a cultural resources construction personnel training program to promote cultural resources identification and lawful and appropriate response to discoveries.

Table B-2 *(continued)*
Required Plans

	• Notify involved agencies of unexpected cultural or historical resources discoveries during construction. The project developer may be asked or ordered to cease construction in the vicinity of the discovery to allow evaluation and formulation of appropriate mitigation measures. • If human remains are discovered, cease construction and consult with the lead agencies. The agencies will likely follow particular state and federal laws that address the treatment of human remains. • Where unavoidable impacts from project construction are expected, recover data from newly discovered NRHP-eligible cultural resources. • Have the cultural resources specialist prepare a report documenting archaeological monitoring and data recovery activities. Project proponents should expect to provide input to lead agency-prepared mitigation plans, agreement documents and related historic properties treatment plans. Treatment plans will guide: • Completion of any supplemental surveys needed to address refinements in the final project design to ensure full coverage of areas that could be affected.. • Outstanding geoarchaeological investigations. • Evaluation of newly identified cultural resources for NRHP eligibility. • Assessment of project impacts to NRHP-eligible cultural resources. • Development of measures to address the effects of the project on such eligible resources to avoid or reduce impacts as much as possible. IM 2009-043 - Cultural Resources Management Plan If cultural resources are present at the site, or if areas with a high potential to contain cultural material have been identified, a cultural resources management plan (CRMP) shall be developed. This plan shall address mitigation activities to be taken for cultural resources found at the site. Avoidance of the area is always the preferred mitigation option. Other mitigation options include archaeological survey and excavation, and monitoring. If an area exhibits a high potential, but no artifacts were observed during an archaeological survey, monitoring by a qualified archaeologist may be required during all excavation and earthmoving in the high-potential area. A report shall be prepared documenting these activities. The CRMP also shall (1) establish a monitoring program, (2) identify measures to prevent potential looting/vandalism or erosion impacts, and (3) address the education of workers and the public to make them aware of the consequences of unauthorized collection of artifacts and destruction of property on public lands.
Integrated Vegetation Management Plan	An Integrated Vegetation Management Plan shall be developed that is consistent with applicable regulations and agency policies for the control of noxious weeds and invasive plant species. The plan shall address monitoring; ROW vegetation management; the use of certified weed-free seed and mulching; the cleaning of vehicles to avoid the introduction of invasive weeds; and the education of personnel on weed identification, the manner in which weeds spread, and the methods for treating infestations. For transmission line ROWs, the plan shall be consistent with the existing vegetation management plan for that ROW. Principles of integrated pest management, including biological controls, shall be used to prevent the spread of invasive species. The plan shall include periodic monitoring, reporting, and immediate eradication of noxious weed or invasive species occurring within all managed areas. A controlled inspection and cleaning area shall be established to visually inspect construction equipment arriving at the project area and to remove and collect seeds that may be adhering to tires and other equipment surfaces. To prevent the spread of invasive

Table B-2 *(continued)*
Required Plans

	species, project developers shall work with the local BLM field office to determine whether a pre-activity survey is warranted, and if so, conduct the survey. If invasive plant species are present, project developers shall work with the local BLM field office to develop a control strategy. The plan shall include a post-construction monitoring element that incorporates adaptive management protocols.
Lighting Plan	A Lighting Plan shall be prepared that documents how lighting will be designed and installed to minimize night-sky impacts during facility construction and operations phases. Lighting for facilities shall not exceed the minimum number of lights and brightness required for safety and security and shall not cause excessive reflected glare. Full cut-off luminaires shall be utilized to minimize uplighting. Lights shall be directed downward or toward the area to be illuminated. Light fixtures shall not spill light beyond the project boundary. Lights in high-illumination areas not occupied on a continuous basis shall have switches, timer switches, or motion detectors so that the lights operate only when the area is occupied. Where feasible, vehicle-mounted lights shall be used for night maintenance activities. Wherever feasible, consistent with safety and security, lighting shall be kept off when not in use. The Lighting Plan shall include a process for promptly addressing and mitigating complaints about potential lighting impacts.
Noxious Weeds and Invasive Species Plan (IM 2009-043 and SPEIS)	Operators shall develop a plan for control of noxious weeds and invasive species, which could occur as a result of new surface disturbance activities at the site. The plan shall address monitoring, education of personnel on weed identification, the manner in which weeds spread, and methods for treating infestations. The use of certified weed-free mulch and certified weed-free seed shall be required. If trucks and construction equipment are arriving from locations with known invasive vegetation problems, a controlled inspection and cleaning area shall be established to visually inspect construction equipment arriving at the project area and to remove and collect seeds that may be adhering to tires and other equipment surfaces.
Nuisance Animal and Pest Control Plan (IM 2009-043 - Integrated Pest Management Plan)	An Animal, Pest, and Vegetation Control Plan shall be developed to ensure that applications are conducted within the framework of BLM and DOI policies and standard operating procedures and entail only the use of EPA-registered pesticides/herbicides that also comply with state and local regulations. Any vehicle-wildlife collisions shall be immediately reported to security. Observations of potential wildlife problems, including wildlife mortality, shall be immediately reported to the BLM or other appropriate agency authorized officer. Procedures for removal of wildlife carcasses on-site and along access roads shall be addressed in the Animal, Pest, and Vegetation Control Plan, to avoid vehicle-related mortality of carrion-eaters. If pesticides/herbicides are to be used on the site, an Animal, Pest, and Vegetation Control Plan shall be developed to ensure that applications will be conducted within the framework of designated lead agencies and will entail the use of only EPA-registered pesticides/herbicides that are nonpersistent and immobile and approved by the designated lead agency.

Table B-2 *(continued)*
Required Plans

Paleontological Resource Management Plan (Solar ROD and IM 2009-043)	If paleontological resources are present at the site or if areas with a high potential to contain paleontological material have been identified, a Paleontological Resources Management Plan shall be developed. This shall include a mitigation plan; mitigation may include avoidance, removal of fossils (data recovery), stabilization, monitoring, protective barriers and signs, or other physical or administrative protection measures. The Paleontological Resources Management Plan also shall identify measures to prevent potential looting, vandalism, or erosion impacts and address the education of workers and the public to make them aware of the consequences of unauthorized collection of fossils on public land.
Spill Prevention and Emergency Response Plan (Solar ROD and IM 2009-043)	As part of a Spill Prevention and Emergency Response Plan, measures to prevent potential groundwater and surface water contamination shall be identified. As part of a Spill Prevention and Emergency Response Plan identify sources, locations, and quantities of potential chemical releases (through spills, leaks, or fires) and to define response measures and notification requirements shall be developed and followed to reduce potential for soil contamination. The plan shall also identify individuals and their responsibilities for implementing the plan. Shall be developed that considers sensitive ecological resources. Spills of any toxic substances shall be promptly addressed and cleaned up before they can enter aquatic or other sensitive habitats due to runoff or leaching. A comprehensive Spill Prevention and Emergency Response Plan shall be developed for the facility that meets the following criteria: is written, periodically updated, and made available to the entire workforce; contains procedures for timely notification of appropriate authorities, including the designated BLM land manager; provides spill/emergency contingency planning for each type of hazardous material present, including abatement or stabilizing of release, recovery of spilled product, and remediation of impacted environmental media; is supported by the strategic deployment of appropriate spill response materials and equipment, including PPE for individuals with spill or emergency response assignments; provides for prompt response to spills and timely delivery of recovered spill materials and contaminated environmental media to appropriately permitted off-site treatment or disposal facilities; formally assigns spill and emergency response duties to specified individuals; provides and documents appropriate training to individuals with spill or emergency response assignments; provides for the prompt response to spills and timely delivery of recovered spill materials and contaminated environmental media to appropriately permitted off-site treatment or disposal facilities; provides general awareness training to remaining facility personnel; and provides for written documentation of each event, including root cause analysis, corrective actions taken, and a characterization of the resulting environmental or health and safety impacts.
Stormwater Management Plan (Solar ROD and IM 2009-043)	A Stormwater Management Plan shall be developed for the site to ensure compliance with applicable regulations and prevent off-site migration of contaminated stormwater, changes in pre-project storm hydrographs, or increased soil erosion. • Siting in identified 100-yr floodplains shall not be allowed within the development. • Projects developers shall maintain the pre-development flood hydrograph for all storms up to and including the 100-yr rainfall event. All stormwater retention and/or infiltration and treatment systems shall also be designed for all storms up to and including the 100-yr storm event.

Table B-2 *(continued)*
Required Plans

Traffic Management Plan (Solar ROD and IM 2009-043)	A traffic management plan shall be prepared for the site access roads to ensure that no hazards will result from increased truck traffic and that traffic flow will not be adversely impacted. This plan shall incorporate measures such as informational signs, flaggers when equipment may result in blocked throughways, and traffic cones to identify any necessary changes in temporary lane configuration. A Traffic Management Plan shall be prepared for the site access roads to control hazards that could result from increased truck traffic (most likely during construction or decommissioning), to ensure that traffic flow will not be adversely affected and that specific issues of concern (e.g., the locations of school bus routes and stops) are identified and addressed. This plan shall incorporate measures such as informational signs, flaggers when equipment may result in blocked throughways, and traffic cones to identify any necessary changes in temporary lane configuration. The plan shall be developed in coordination with local planning authorities. Transportation Plan (IM 2009-043) A transportation plan shall be developed, particularly for the transport of turbine components, main assembly cranes, and other large pieces of equipment. The plan shall consider specific object sizes, weights, origin, destination, and unique handling requirements and shall evaluate alternative transportation approaches. In addition, the process to be used to comply with unique state requirements and to obtain all necessary permits shall be clearly identified. Operators shall consult with local planning authorities regarding increased traffic during the construction phase, including an assessment of the number of vehicles per day, their size, and type. Specific issues of concern (e.g., location of school bus routes and stops) shall be identified and addressed in the traffic management plan.
Trash Abatement Plan	A Trash Abatement Plan shall be developed that focuses on containing trash and food in closed containers and removing them periodically to reduce their attractiveness to opportunistic species, such as common ravens, coyotes, and feral dogs that could serve as predators on native wildlife and special status animals.
Water Resources Monitoring and Mitigation Plan	Project developers who plan to use groundwater shall develop and implement a groundwater Water Resources Monitoring and Mitigation Plan, which includes • Monitoring the effects of groundwater withdrawal for project uses, vegetation restoration and dust control uses during decommissioning, and aquifer recovery after project decommissioning. • Monitoring changes in flows, volumes, and water quality during construction and operations, as well as their recovery during decommissioning. • Monitoring frequency shall be decided on a site-specific basis and in coordination with federal, state, and local agencies managing surface water resources of the region. • Groundwater- and/or surface water-monitoring activities shall be as outlined in the established groundwater monitoring plan for the site. A Water Resources Monitoring and Mitigation Plan shall be developed for each project in consultation with local and state agencies. Changes in surface water or groundwater quality (e.g., chemical contamination, increased salinity, increased temperature, decreased dissolved oxygen, and increased sediment loads) or flow that result in alteration of terrestrial plant communities or communities in wetlands, springs, seeps, intermittent streams, perennial streams, and riparian areas (including alterations of cover and community structure, species composition, and diversity) off the project site shall be avoided to the extent practicable. A monitoring plan shall be developed that determines the effects of groundwater withdrawals on plant communities. See measures applicable to protecting water quality.

Table B-2 *(continued)*
Required Plans

Wind Erosion Management Plan	A wind erosion management plan should be prepared for projects located in a documented high wind area. The plan shall ensure protection of water quality, air quality and soil resources on the project site. The plan will develop mitigation measures that prevent excessive and unnatural soil deposition and erosion.
Worker Environmental Awareness Program	Develop a project-specific worker environmental awareness program (WEAP) that meets the approval of the issuing BLM office and would be carried out during all phases of the project (site mobilization, ground disturbance, grading, construction, operation, closure/decommissioning, or project abandonment, and restoration/reclamation activities). Identify in the WEAP biological resources and BMPs for minimizing impacts to resources. Provide interpretation for non-English speaking workers, and provide the same instruction for new workers prior to their working onsite. Keep in project field construction office files the names of onsite personnel (for example, surveyors, construction engineers, employees, contractors, contractor's employees, subcontractors) who have participated in the education program. At a minimum, include the following in the program: • Photos and habitat descriptions for special status species that may occur on the project site and information on their distribution, general behavior, and ecology. • Species sensitivity to human activities. • Legal protections afforded the species. • Project BMPs for protecting species. • State and federal law violation penalties. • Worker responsibilities for trash disposal and safe/ humane treatment of special status species found on the project site, associated reporting requirements, and specific required measures to prevent taking of threatened or endangered species. • Handout materials summarizing the contractual obligations and protective requirements specified in project permits and approvals. • Project site speed limit requirements and penalties.
Health and Safety Program	A health and safety program shall be developed to protect workers during site characterization, construction, operation, and decommissioning of a renewable energy project. The program shall identify all applicable federal and state occupational safety standards and establish safe work practices addressing all hazards, including requirements for developing the following plans: general injury prevention; PPE requirements and training; respiratory protection; hearing conservation; electrical safety; hazardous materials safety and communication; housekeeping and material handling; confined space entry; hand and portable power tool use; gas-filled equipment use; and rescue response and emergency medical support, including on-site first-aid capability. In addition, the health and safety program shall address OSHA standard practices for the safe use of explosives and blasting agents (e.g., if used to construct foundations for power tower facilities); measures for reducing occupational EMF exposures; the establishment of fire safety evacuation procedures; and required safety performance standards (e.g., electrical system standards and lighting protection standards). The program shall include training requirements for applicable tasks for workers and establish procedures for providing required training to all workers. Documentation of training and a mechanism for reporting serious accidents to appropriate agencies shall be established.
Noise Monitoring and Mitigation Plan	Prepare a noise monitoring and mitigation plan. Design the project to: minimize noise impacts to sensitive noise receptors, limit increases to less than a five to 10 dBA

Table B-2 *(continued)*
Required Plans

	increase above ambient levels, and not exceed local noise standards. Address project generated noise impacts as much as possible. Consider acquiring lands to serve as buffers around the proposed facilities.
Bat and Avian Protection Plan	Protect bats and migratory birds while improving conservation, safety, and reliability for utility customers. Projects will be analyzed on a case-by-case basis to determine whether development of an avian protection plan (APP) and/or avian bat protection plan (ABPP) is necessary.
Facility Vector (such as mosquitoes or rodents) Control Plan	A Facility Vector Control Plan that meets the permitting agency approval and would be implemented during all phases of the project.
Hazardous Materials and Waste Management Plan	Shall address the selection, transport, storage, and use of all hazardous materials needed for construction, operation, and decommissioning of the facility for local emergency response and public safety authorities and for the regulating agency, and shall address the characterization, on-site storage, recycling, and disposal of all resulting wastes. The plan shall, at a minimum, include the following: facility identification; comprehensive hazardous materials inventory; Material Safety Data Sheets (MSDS) for each type of hazardous material; emergency contacts and mutual aid agreements, if any; site map showing all hazardous materials and waste storage and use locations; copies of spill and emergency response plans and hazardous materials-related elements of a decommissioning/closure plan.
Construction and Operation Waste Management Plan	Shall identify the waste streams that are expected to be generated at the site and addresses hazardous waste determination procedures, waste storage locations, waste-specific management and disposal requirements, inspection procedures, and waste minimization procedures. The plan shall address all solid and liquid wastes that may be generated at the site in compliance with the CWA requirements to obtain the project's NPDES permit.

Table B-3
Required Studies

Transmission interconnection study	In applications to appropriate lead agencies, provide a copy of the electric transmission interconnection study from the appropriate control agency. Include in the interconnection study an identification of the transmission impacts beyond the first point of interconnection and acceptable measures to mitigate/alleviate impacts to the transmission network system. When more than one alternative mitigation measure is identified, indicate in the applications the measure selected by the project developer. Provide for each selected mitigation measure, an environmental analysis sufficient to meet the CEQA requirements for indirect project impacts.
Preliminary hydrologic study	Project developers shall conduct a preliminary hydrologic study demonstrating a clear understanding of the local surface water and groundwater hydrology. At a minimum this hydrologic study shall include: • The relationship of the project site hydrologic basin to the basins in the region • Identification of all surface water bodies (including rivers, streams, ephemeral washes/drainages, lakes, wetlands, playas and floodplains) • Identification of all applicable groundwater aquifers • Preliminary estimates of physical characteristics of surface water features, groundwater aquifers, and the regional climate (seasonal and long term)
Detailed hydrologic study	Developers shall be required to conduct a detailed hydrologic study demonstrating a clear understanding of the local surface water and groundwater hydrology. At a minimum this hydrologic study shall include: • Quantification of physical characteristics describing surface water features, such as streamflow rates, stream cross-sections, channel routings, seasonal flow rates (intermittent streams), peak flow rates (ephemeral washes/drainages), sediment characteristics and transport rates, lake depths, and surface areas of lakes, wetlands, and floodplains; • Hydrologic analysis and modeling to define the 100-yr, 24-hour rainfall event for the project area and calculation of projected runoff from this storm at site; • Hydrologic analysis and modeling to identify 100-yr floodplain boundaries of any surface water feature on the site; • Quantification of physical characteristics describing the groundwater aquifer, such as physical dimensions of the aquifer, sediment characteristics, confined/unconfined conditions, hydraulic conductivity and transmissivity distribution of the aquifer, groundwater surface elevations, and groundwater flow processes (direction, recharge/discharge, current basin extractions, and surface water-groundwater connectivity); • Quantification of regional climate including seasonal and long-term information on temperatures, precipitation, evaporation, and evapotranspiration; and • Quantification of the sustainable yield of surface waters and groundwater available to the project. Project developers shall evaluate the water sources in terms of existing water rights and management plans for adequacy to serve project demands while maintaining aquatic, riparian, and other water-dependent resources.
Comprehensive groundwater basin analysis	If groundwater use is proposed, project developers shall ensure that a comprehensive analysis of the groundwater basin is provided and that the following potential significant impacts are evaluated: • Creation or exacerbation of overdraft conditions and their potential to cause subsidence and loss of aquifer storage capacity

Table B-3 *(continued)*
Required Studies

	• Use that causes injury to other water users and rights claimants in the basin • Estimates of the total cone of depression considering cumulative drawdown from all potential pumping in the basin, including the project, for the life of the project through the decommissioning phase. • Changes in water quality that affect other beneficial use; and • Effects on groundwater dependent ecosystems such as springs, seeps, and wetlands that provide water for plants and animals.
Geomorphology Technical Report	Retain the services of a geoarchaeologist, when appropriate, to investigate and complete a geomorphology technical report. Include the following elements: • Reconstruct the historical geomorphology of the project's Area of Potential Effects (APE) • Map and date the sediments of the landforms in that area • Assess whether buried archaeological deposits may be present and subject to project impacts
Safety Assessment	A safety assessment shall be conducted to describe potential safety issues and the means that would be taken to mitigate them, including issues such as site access; construction; safe work practices; glare exposure from mirrors, heliostats, and/or power towers; security; heavy equipment transportation; traffic management; emergency procedures; and fire control.
Health Risk Assessment	A health risk assessment shall evaluate potential cancer and noncancer risks to workers and the general public from exposure to facility emission sources during construction and operations. If potential risks are found to exceed applicable threshold levels, measures shall be taken to decrease emissions from the source.

Table B-4
Best Management Practices

No.	Topic	Description of Measure	Phase
Air Quality			
1	Emissions	On-site vehicle use shall be reduced to the extent feasible.	C, O, D
2	Emissions	Idling of diesel equipment shall be limited to no more than 10 minutes unless idling must be maintained for proper operation (e.g., drilling, hoisting, and trenching).	C, O, D
3	Emissions	Consider using electric vehicles, biodiesel, or alternative fuels during construction and operation phases to reduce the project's criteria and GHG pollutant emissions.	C, O, D
4	Fugitive dust	Workers shall be trained to comply with the speed limit, use good engineering practices, minimize drop height of materials, and minimize disturbed areas.	C, O, D
5	Fugitive dust	Construction shall be staged to limit the exposed area at any time, whenever practical.	C, O, D
6	Fugitive dust	Access to the construction site and staging areas shall be limited to authorized vehicles only through the designated treated roads.	C, O, D
7	Fugitive dust	Access roads, on-site roads, and parking lots shall be surfaced with aggregate with hardness sufficient to prevent vehicles from crushing the aggregate and thus causing dust or compacted soil conditions. Paving could also be used on access roads and parking lots. Alternatively, chemical dust suppressants or durable polymeric soil stabilizers shall be used on these locations.	C, O, D
8	Fugitive dust	All unpaved roads, disturbed areas (e.g., areas of scraping, excavation, backfilling, grading, and compacting), and loose materials generated during project activities shall be watered as frequently as necessary to minimize fugitive dust generation. In water-deprived locations, water spraying shall be limited to active disturbance areas only and non-water-based dust control measures shall be implemented in areas with intermittent or non-heavy use, such as stockpiles or access roads.	C, O, D
9	Fugitive dust	Speed limits (e.g., 10 mph [16 km/h]) within the construction site shall be posted with visible signs and enforced to minimize airborne fugitive dust.	C, D
10	Fugitive dust	All vehicles transporting loose materials traveling on public roads shall be covered, and loads shall be sufficiently wet and kept below the freeboard of the truck.	C, O, D
11	Fugitive dust	Tires of all construction-related vehicles shall be inspected and cleaned as necessary to be free of dirt prior to entering paved public roadways.	C, D
12	Fugitive dust	Visible trackout or runoff dirt on public roadways from the construction site shall be cleaned (e.g., through street vacuum sweeping).	C, D

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
13	Fugitive dust	Topsoil from all excavations and construction activities shall be salvaged and reapplied during reclamation or, where feasible, used for interim reclamation by being reapplied to construction areas not needed for facility operation as soon as activities in that area have ceased. Unused topsoil and other erosion-susceptible material shall be removed from the site via covered trucks.	C, O, D
14	Fugitive dust	Use wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) where soils are disturbed in construction, access and maintenance routes, and materials stock pile areas. Keep related windbreaks in place until the soil is stabilized or permanently covered with vegetation. Wind fences shall be installed around disturbed areas that could affect the area beyond the site boundaries (e.g., nearby residences).	C, O, D
15	Fugitive dust	All soil disturbance activities shall be minimized and travel on unpaved roads shall be conducted during periods of low winds and stable conditions typical of early morning hours from late fall to early spring, to the extent practicable, which could significantly lower potential impacts on ambient air quality.	C, O, D
16	Fugitive dust	Any stockpiles created shall be kept on-site, with an upslope barrier in place to divert runoff. Stockpiles shall be sprayed with water, covered with tarpaulins, and/or treated with appropriate dust suppressants, especially in preparation for high wind or storm conditions. Compatible native vegetative plantings may also be used to limit dust generation for stockpiles that will be inactive for a relatively long period. Chemical dust suppressants that emit volatile organic compounds (VOCs) shall be avoided within or near O_3 nonattainment areas.	C
17	Fugitive dust	Potential environmental impacts from the use of dust palliatives shall be minimized by taking all necessary measures to keep the chemicals out of sensitive soil and streams. In addition, the application of dust palliatives shall comply with federal, state, and local laws and regulations. Dust palliatives must meet the requirements of the applicable transmission system operator (e.g., Western Area Power Administration construction standards prohibit use of oil as a dust suppressant).	C, O, D
Ecological			
18	Staging areas	As practical, staging and parking areas shall be located within the site of the utility-scale renewable energy facility to minimize habitat disturbance in areas adjacent to the site.	C, O, D
19	Construction activities	Before beginning construction, delineate the boundaries of areas to be disturbed using temporary construction fencing and/or flagging, and confine disturbances, project vehicles, and equipment to the delineated project areas.	C, D
20	Construction	To the extent practicable, work personnel shall stay within the ROW and/or easements.	C, O, D

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
21	Fugitive dust	If the application of water is needed to abate dust in construction areas and on dirt roads, use the least amount needed to meet safety and air quality standards and prevent the formation of puddles, which could attract wildlife to construction sites.	C, D
22	Traffic	Existing access roads, utility corridors, and other infrastructure shall be used to the maximum extent feasible.	C, O, D
23	Traffic	Plant species that would attract wildlife shall not be planted along high speed or high-traffic roads. If applicable, an avian and bat protection plan will be developed.	C, O, D
24	Traffic	Road closures shall be considered during crucial periods (e.g., extreme winter conditions, calving/fawning seasons). Personnel shall be advised to minimize stopping and exiting their vehicles in the winter ranges of large game while there is snow on the ground.	C, O, D
25	Helicopter use	The minimization of habitat disturbance shall be considered through utilizing helicopters for construction to minimize the need for access roads, and by locating transmission facilities in previously disturbed areas. Existing utility corridors and other support structures shall be utilized to the maximum extent feasible.	C, O, D
26	Noise	Noise reduction devices (e.g., mufflers) shall be employed to minimize the impacts on wildlife and special status species populations. Explosives shall be used only within specified times and at specified distances from sensitive wildlife or surface waters as established by the designated lead agency or other federal and state agencies. Operators shall ensure that all equipment is adequately muffled and maintained in order to minimize disturbance to wildlife	C, O, D
27	Noise	Minimize construction and operation related noise levels to minimize impacts to wildlife.	C, O, D
28	Power lines	Place low and medium voltage connecting power lines underground whenever possible. In certain circumstances, burial of the lines may be prohibitively expensive (for example in shallow bedrock areas) or may cause unacceptable impacts to wetland habitats and dependent species. Overhead lines may be acceptable: • if sited away from high bird crossing locations, such as between roosting and feeding areas or between lakes, rivers, and nesting areas; and/or • when the structures parallel tree lines or are otherwise screened so that collision risk is reduced.	S, C
29	Aquatic habitat	The placement of transmission towers within aquatic and wetland habitats shall be avoided whenever feasible. If towers must be placed within these habitats, they shall not impede flows or fish passage.	S, C, O

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
30	Aquatic habitat	Low-water crossings (fords) shall be used only as a last resort and then during the driest time of the year. Rocked approaches to fords shall be used. The pre-existing stream channel, including bed and banks, shall be restored after the need for a low-water ford has passed.	C, O, D
31	Habitat	To reduce the extent of habitat disturbance during construction and operation, existing access roads, utility corridors, and other infrastructure shall be used to the maximum extent feasible and foot and vehicle traffic through undisturbed areas shall be minimized.	C, O, D
32	Habitat	Areas left in a natural condition during construction (e.g., wildlife crossings) shall be maintained in as natural a condition as possible within safety and operational constraints.	C, O, D
33	Habitat	Projects shall be planned to avoid, minimize, or mitigate impacts on aquatic habitats, wetland habitats, waters of the United States, other special aquatic sties, unique biological communities, crucial wildlife habitats, breeding areas, and special status species locations and habitats, including designated critical habitat. Project planning shall be coordinated with the appropriate federal and state resource management agencies.	S
34	Habitat	Habitat loss, habitat fragmentation, and resulting edge habitat due to project development shall be minimized to the extent practicable. Habitat fragmentation could be reduced by consolidating facilities (e.g., access roads and utilities could share common ROWs, where feasible), reducing the number of access roads to the minimum amount required, minimizing the number of stream crossings within a particular stream or watershed, and, locating facilities in areas where habitat disturbance has already occurred. Individual project facilities shall be located and designed to minimize disruption of animal movement patterns and connectivity of habitats.	S
35	Habitat	The number of areas where wildlife could hide or be trapped (e.g., open sheds, pits, uncovered basins, and laydown areas) shall be minimized. All pits shall contain wildlife escape ramps. For example, an uncovered pipe that has been placed in a trench shall be capped at the end of each workday to prevent animals from entering the pipe. If a special status species is discovered inside a component, that component must not be moved or, if necessary, moved only to remove the animal from the path of activity, until the animal has escaped.	C, O, D
36	Birds	Locating renewable energy power facilities near open water or other areas known to attract a large number of birds shall be avoided.	S
37	Birds/bats	Tall structures shall be located to avoid known flight paths of birds and bats.	S
38	Birds/ raptors	Project proponents should establish buffer zones and protection, mitigation, and monitoring plans for active nests detected during surveys.	S, C
39	Birds	Although it is unclear whether tubular or lattice towers pose less risk, it is recommended that tubular towers or best available technology be used to reduce bird perching opportunities on turbines.	S, C, O

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
40	Raptors	Turbines shall be configured to avoid landscape features known to attract raptors if site studies show that placing turbines there would pose a significant risk to raptors.	S
41	Special status species	In consultation with permitting agencies, avoid special status species or unique plant assemblages when installing and maintaining transmission line towers/poles, access roads, pulling sites, and storage and parking areas adjacent to linear facilities.	S, C, O
42	Special status species	During all project phases, buffer zones shall be established around sensitive habitats, and project facilities and activities shall be excluded or modified within those areas, to the extent practicable.	C, O, D
43	Special status species	Project activities shall not be located in or near occupied habitats of special status animal species. Buffer zones shall be established around these areas (e.g., identified in the land use plan or substantiated by best available information or science), to prevent any destructive impacts associated with project activities.	S
44	Special status habitat	Prior to any ground-disturbing activity, seasonally appropriate walkthroughs shall be conducted by a qualified biologist or team of biologists to ensure that important or sensitive species or habitats are not present in or near project areas. Attendees at the walkthrough shall include appropriate federal agency representatives, state natural resource agencies, and construction contractors, as appropriate. Habitats or locations to be avoided (with appropriately sized buffers) shall be clearly marked.	C, O, D
45	Vegetation	Project-specific vegetation management plans shall investigate possibilities of revegetating parts of the renewable energy project area. Where revegetation is accomplished, fire breaks are required, such that vegetated areas would not result in increased fire hazard.	S, C, D
46	Wetlands	Where a pipeline trench may drain a wetland, trench breakers shall be constructed and/or the trench bottom shall be sealed to maintain the original wetland hydrology.	C, O, D
47	Noxious weeds	The establishment and spread of invasive species and noxious weeds within the ROW and in associated areas of ground surface disturbance or vegetation cutting shall be prevented. The area shall be monitored regularly and invasive species should be eradicated immediately.	C, O, D
48	Herbicide use	Herbicide use shall be limited to nonpersistent, immobile substances. Only herbicides with low toxicity to wildlife and nontarget native plant species shall be used, as determined in consultation with the USFWS. The typical herbicide application rate shall be used rather than the maximum application rate, where effective. All herbicides shall be applied in a manner consistent with their label requirements and in accordance with guidance provided in the Final PEIS on vegetation treatments using herbicides (BLM 2007c). No herbicides shall be used near or in surface water, streams (including ephemeral, intermittent, or perennial), riparian areas, or wetlands. Setback distances shall be determined through coordination with federal and state resource management	C, O, D

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
		agencies. Before herbicide treatments are begun, the designated lead agency or an authorized contractor shall conduct nest searches in and around treatment areas to minimize impacts on migratory birds.	
49	Waste	Construction debris, especially treated wood, shall not be stored or disposed of in areas where it could come in contact with aquatic habitats.	C, O, D
50	Reclamation	Access roads shall be reclaimed when they are no longer needed. However, seasonal restrictions (e.g., nest and brood rearing) shall be considered, as appropriate (e.g., identified in the land use plan or substantiated by best available information or science).	C, O, D
51	Reclamation	All holes and ruts created by removal of structures and access roads shall be filled or graded.	D
52	Reclamation	While structures are being dismantled, care shall be taken to avoid leaving debris on the ground in areas in which wildlife regularly move.	D
53	Reclamation	The facility fence shall remain in place for several years to help reclamation (e.g., would preclude large mammals and vehicles from disturbing revegetation efforts).	D
54	Reclamation	For a repowering or retrofit project, remove and stabilize roads and facilities that are no longer needed; re-seed with native plants appropriate for the soil conditions and adjacent habitat. Derive plants from local seed sources where feasible. The term ″local″ in this context means seed sources with a genetic makeup that do not vary substantially from seeds or plants found at the disturbed location.	C
55	Biological monitor	Vehicles and site workers shall avoid entering aquatic habitats such as streams and springs during site characterization activities until surveys by qualified biologists have evaluated the potential for unique flora and fauna to be present.	C, O, D
Hazardous Materials			
56	Training	Ensure that on-site workers are fully trained to properly handle and are informed about each of the hazardous materials to be used on-site.	C, O, D
57	Hazardous materials	Pollution prevention opportunities shall be identified and implemented, including material substitution of less hazardous alternatives, recycling, and waste minimization.	C, O, D
58	Hazardous materials	Written procedures for the storage, use, and transportation of each type of hazardous material present shall be provided, including all vehicle and equipment fuels.	S, C, O, D
59	Hazardous materials	Authorized users for each type of hazardous material shall be identified.	C, O, D

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
60	Hazardous materials	Hazardous materials and waste storage areas or facilities shall be formally designated and access restricted to authorized personnel. Construction debris, especially treated wood, shall not be disposed of or stored in areas where it could come in contact with aquatic habitats.	S, C, O, D
61	Hazardous materials	Hazardous materials and waste storage areas must be consistent with accepted industry practices as well as applicable federal, state, and local regulations and that include, at a minimum, containers constructed of compatible materials, properly labeled, and in good condition; secondary containment features for liquid hazardous materials and wastes; physical separation of incompatible chemicals; and fire-fighting capabilities when warranted.	C, O, D
62	Hazardous materials	Procedures shall be established for fuel storage and dispensing, including shutting off vehicle (equipment) engines; using only authorized hoses, pumps, and other equipment in good working order; maintaining appropriate fire and spill response materials at equipment-fueling stations; providing emergency shutoffs for fuel pumps; ensuring that fueling stations are paved; ensuring that both aboveground fuel tanks and fueling areas have adequate secondary containment; prohibiting smoking, welding, or open flames in fuel storage and dispensing areas; equipping the area with fire suppression devices, as appropriate; conducting routine inspections of fuel storage and dispensing areas; requiring prompt recovery and remediation of all spills, and providing for the prompt removal of all fuel and fuel tanks used to support construction vehicles and equipment at the completion of facility construction and decommissioning phases.	S, C, O, D
63	Hazardous materials	Good waste management practices shall be adopted for handling, storing, and disposing of wastes generated by a construction project to prevent the release of waste materials into stormwater discharges; waste management includes the following: spill prevention and control, construction debris and litter management, concrete waste management, and liquid waste management.	C, O, D
64	Hazardous materials storage	To the greatest extent practical and considering the remoteness of a given facility, "just-in-time" ordering procedures shall be employed that are designed to limit the amounts of hazardous materials present on the site to quantities minimally necessary to support continued operations; excess hazardous materials shall receive prompt disposition.	C, O, D
65	Herbicide/ pesticide use	Avoid rinsing herbicide/pesticide spray tanks in or near water bodies.	C, O, D
66	Spills	Berms and other controls shall be used at facilities to prevent off-site migration of any leaked or spilled HTF, TES fluids, or any other chemicals stored or used at the site.	C, O, D
67	Spills	Remediate hazardous product leaks and chemical releases that constitute a Recognized Environmental Condition before completing decommissioning.	D

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
68	Transporting hazardous materials	Dedicated areas with secondary containment shall be established for off-loading hazardous materials transport vehicles.	C, O, D
69	Refueling	Refueling areas shall be located away from surface water locations and drainages and on paved surfaces; features shall be added to direct spilled materials to sumps or safe storage areas where they can be subsequently recovered.	S, C, O, D
70	Vehicles	All vehicles and equipment shall be in proper working condition to ensure that there is no potential for leaks of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials.	C, O, D
71	Inspections	Written procedures shall be established for inspecting hazardous materials and waste storage areas and for plant systems containing hazardous materials; identified deficiencies and their resolution shall be documented.	S, C, O, D
72	Waste removal	Schedules shall be established for the regular removal of wastes (including sanitary wastewater generated in temporary, portable sanitary facilities) for delivery by licensed haulers to appropriate off-site treatment or disposal facilities.	C, O, D
73	Decommissioning	During facility decommissioning, the following shall occur: emergency response capabilities shall be maintained throughout the decommissioning period as long as hazardous materials and wastes remain on-site, and emergency response planning shall be extended to any temporary material and equipment storage areas that may have been established; temporary waste storage areas shall be properly designated, designed, and equipped; hazardous materials removed from systems shall be properly containerized and characterized, and recycling options shall be identified and pursued; off-site transportation of recovered hazardous materials and wastes resulting from decommissioning activities shall be conducted by authorized carriers; all hazardous materials and waste shall be removed from on-site storage and management areas (including surface impoundments), and the areas shall be surveyed for contamination and remediated as necessary.	D
Health and Safety			
74	Health	A health risk assessment shall evaluate potential cancer and noncancer risks to workers from exposure to facility emission sources during construction and operations. If potential risks are found to exceed applicable threshold levels, measures shall be taken to decrease emissions from the source.	S, C, O, D
75	Safety	A safety assessment shall be conducted to describe potential safety issues and the means that would be taken to mitigate them, including issues such as site access; construction; safe work practices; glare exposure from mirrors, heliostats, and/or power towers; security; heavy equipment transportation; traffic management; emergency procedures; and fire control.	S, C, O, D

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
76	EMF	Measures shall be considered to reduce occupational EMF exposures, such as backing electrical generators with iron to block EMF, shutting down generators when working in the vicinity, and otherwise limiting exposure time and proximity while generators are running.	S
77	Traffic	Operators shall consult with local planning authorities regarding increased traffic during the construction phase, including an assessment of the number of vehicles per day, their size, and type. Specific issues of concern (e.g., location of school bus routes and stops) shall be identified and addressed in the traffic management plan.	O
78	Firearms	Prohibit workers or visitors, with the exception of law enforcement personnel, from bringing firearms or weapons to the project site.	C, O, D
79	Wastewater	Any wastewater generated in association with temporary, portable sanitary facilities shall be periodically removed by a licensed hauler and introduced into an existing municipal sewage treatment facility. Portable sanitary facilities provided for construction crews shall be adequate to support expected on-site personnel.	C, O, D
Lands and Realty			
80	Land use	To plan for efficient use of the land, necessary infrastructure requirements shall be consolidated wherever possible, and current transmission and market access shall be evaluated carefully.	S
81	Overhead lines	All electrical collector lines shall be buried in a manner that minimizes additional surface disturbance (e.g., along roads or other paths of surface disturbance). Overhead lines may be used in cases where burial of lines would result in further habitat disturbance.	S
82	Monitoring	Site monitoring protocols defined in the POD shall be implemented. These will incorporate monitoring program observations and additional mitigation measures into standard operating procedures and BMPs to minimize future environmental impacts.	S, C
83	Monitoring	All control and mitigation measures established for the project in the POD and the resource-specific management plans that are part of the POD shall be maintained and implemented throughout the construction phase, as appropriate.	S, C
84	Monitoring	Results of monitoring program efforts shall be provided to the BLM authorized officer.	C, D
85	Decommissioning	All management plans, BMPs, and stipulations developed for the construction phase shall be applied to similar activities during the decommissioning phase.	D
Livestock Grazing			
86	Roads	Access roads shall be constructed, improved, and maintained to minimize impact on grazing operations. Road design will include appropriate fencing, cattle guards, and signs.	C, O

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
Minerals			
87	Mining	Transmission lines shall be located to avoid conflicts with mining activities in areas with active mineral development.	S
Native American Concerns			
88	Training	Prior to construction, consideration shall be given to training contractor personnel whose activities or responsibilities could affect resources of significance to Native Americans during construction. When there is a reasonable expectation of encountering unidentified cultural resources during construction, monitoring of construction shall be considered to minimize impacts on resources of significance to Tribes to the extent possible.	S, C, O, D
89	Visual	Visual intrusion on sacred areas and places of traditional importance shall be avoided to the extent practical through the selection of renewable energy facility location and technology. When avoidance is not possible, timely and meaningful consultation with the affected Tribe(s) shall be conducted to formulate a mutually acceptable plan to minimize or mitigate the adverse effect.	S
90	Noise	Standard noise mitigation measures shall be employed when near sacred sites to minimize the impacts of noise on culturally significant areas.	C, O, D
91	Health and safety	Health and safety mitigation measures for the general public shall be employed when renewable energy facilities are located near to Native American traditional use areas in order to minimize potential health and safety impacts to Native Americans.	C, O, D
92	Mitigation	All mitigation measures listed in cultural resources shall also apply to historic properties of concern to Native Americans.	S, C, O, D
Noise – Vibration			
93	Construction	Siting of stationary construction equipment (e.g., compressors and generators) shall be far from nearby residences and other sensitive receptors.	C, O, D
94	Equipment	If noise from a transformer becomes an issue, a new transformer with reduced flux density, which generates noise levels as much as 10 to 20 dB lower than National Electrical Manufacturers Association (NEMA) standard values, could be installed. Alternatively, barrier walls, partial enclosures, or full enclosures could be adopted to shield or contain the transformer noise, depending on the degree of noise control needed.	O
95	Equipment	Permanent sound-generating facilities (e.g., compressors, pumps) shall be sited away from residences and other sensitive receptors. In areas of known conflicts, consideration shall be given to the installation of acoustic screening.	O

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
96	Equipment	Where feasible, low-noise systems (e.g., for ventilation systems, pumps, generators, compressors, and fans) shall be incorporated and equipment selected that has no prominent discrete tones.	C, O, D
97	Equipment	All equipment shall be maintained in good working order in accordance with manufacturers' specifications. For example, suitable mufflers and/or air-inlet silencers shall be installed on all internal combustion engines (ICEs) and certain compressor components.	C, O, D
98	Equipment	All equipment shall have sound-control devices no less effective than those provided on the original equipment. All construction equipment used shall be adequately muffled and maintained. Properly maintain mufflers, brakes, and loose items on construction and operation related vehicles to minimize noise and ensure safe operations. Operate trucks as quietly as possible, while considering local conditions. Advise about downshifting and vehicle operations in residential communities to keep truck noise to a minimum.	C, O, D
99	Equipment	Install mufflers on diesel and gas-driven engine air coolers and exhaust stacks. Equip emergency pressure relief valves and steam blow-down lines with silencers to limit noise levels.	C, O, D
100	Equipment	If residences or sensitive receptors are nearby, noisy equipment, such as turbines and motors, shall be placed in enclosures.	O
101	Equipment	If a wet-cooling tower is to be used, the louvered side shall be sited to face away from sensitive human receptors. The cooling tower shall be located such that nearby equipment can act as a barrier and serve as additional noise reduction. Quieter fans shall be selected in the facility design, and fans shall be operated at a lower speed, particularly if operating at night. If a high degree of reduction is required, silencers shall be used on the fan stacks.	S, O
102	Equipment	Use variable speed turbines or pitched blades to lower rotational speed.	S, O
103	Helicopter	Helicopter flights at low altitude (under 1,500 ft. [457 m]) near noise-sensitive receptors shall be minimized except at locations where only helicopter activities can perform the task.	C, O, D
104	Vehicles	Construction and decommissioning activities and construction traffic shall be scheduled to minimize disruption to nearby residents and existing operations surrounding the project areas.	C, O, D
105	Vehicles	All vehicles traveling within and around the project area shall be operated in accordance with posted speed limits to reduce vehicular noise levels.	C, O, D
106	Safety	Warning signs shall be posted in high-noise areas, and a hearing protection program shall be implemented for work areas with noise in excess of 85 dBA.	C, O, D

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
107	Timing	Whenever feasible, different noisy activities shall be scheduled to occur at the same time, since additional sources of noise generally do not increase noise levels at the site boundary by much. That is, less-frequent but noisy activities would generally be less annoying than lower level noise occurring more frequently.	C, O, D
108	Monitoring/ mitigation	Project developers shall realize that complaints about noise may still occur, even when the noise levels from the facility do not exceed regulatory levels. Accordingly, a noise complaint process and hotline for the surrounding communities shall be implemented, including documentation, investigation, evaluation, and resolution of all legitimate project-related noise complaints.	C, O, D
109	Monitoring/ mitigation	Noise reduction measures that shall be considered include siting noise sources to take advantage of topography and distance, and constructing engineered sound barriers and/or berms or sound-insulated buildings, if needed, to reduce potential noise impacts at the locations of nearby sensitive human receptors. As an alternative, the solar facility generating higher operational noises (e.g., a solar dish engine facility) could take advantage of higher background noises; for example, it could be sited within an existing noisy area, such as close to a well-traveled highway, where the ambient sounds partially mask the noise from the facility.	S, C, O, D
110	Monitoring/ mitigation	Noise control measures (e.g., erection of temporary wooden noise barriers) shall be implemented if noisy activities would be expected near sensitive receptors.	C, O, D
111	Monitoring/ mitigation	If noisy activities, such as blasting or pile driving, are required during the construction or decommissioning period, nearby residents shall be notified in advance.	C, O, D
112	Monitoring/ mitigation	Employ engineering controls, including sound-insulated equipment and control rooms, to reduce the average noise level to appropriate levels in normal work areas.	C, O, D
Recreation			
113	Siting	Renewable energy facilities shall not be placed in areas of unique or important recreation resources.	S
114	Access	Replacement of access lost for OHV use shall be considered as part of the analysis of project-specific impacts.	S
Soils			
115	Construction	Construction shall be conducted in stages to limit the areas of exposed soil at any given time. For example, only land that will be actively under construction in the near term (e.g., within the next 6 to 12 months) should be cleared of vegetation.	C, O, D
116	Construction	Ground-disturbing activities shall be minimized, especially during the rainy season.	C, O, D
117	Construction	Construction on wet soils shall be avoided.	C, O, D

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
118	Construction	Foundations and trenches shall be backfilled with originally excavated material as much as possible. Excess excavation materials shall be disposed of only in approved areas or, if suitable, stockpiled for use in reclamation activities.	C, O, D
119	Construction	Water or other stabilizing agents shall be used to wet roads in active construction areas and laydown areas to minimize the windblown erosion of soil.	C, O, D
120	Clearing	The clearing and disturbing of sensitive areas (e.g., steep slopes and natural drainages) and other areas shall be avoided outside the construction zone.	C, O, D
121	Disturbance area	The area disturbed by operation of a renewable energy project shall be minimized (e.g., by using existing roads).	C, O, D
122	Disturbance area	The footprint of disturbed areas, including the number and size/length of roads, fences, borrow areas, and laydown and staging areas, shall be minimized.	S, C, O, D
123	Disturbance area	Electrical lines from solar collectors and/or wind turbines shall be buried along existing features (e.g., roads or other paths of disturbance) to minimize the overall area of surface disturbance whenever possible.	C, O, D
124	Disturbance area	Temporary stabilization of disturbed areas that are not actively under construction shall occur.	C, O, D
125	Disturbance area	Permanent stabilization of disturbed areas shall occur during final grading and landscaping of the site.	C, O, D
126	Slopes/ grades	Excessive grades shall be avoided on roads, road embankments, ditches, and drainages, especially in areas with erodible soils.	S, C, O, D
127	Slopes/ grades	Areas with unstable slopes shall be avoided, and local factors that can cause slope instability (e.g., groundwater conditions, precipitation, earthquake activity, slope angles, and the dip angles of geologic strata) shall be identified.	S, C, O, D
128	Slopes/ grades	The creation of excessive slopes shall be avoided during site preparation and construction. Special construction techniques are to be used, where applicable, in areas of steep slopes, erodible soil, and drainage ways.	C, O, D
129	Drainages	Drainage crossings shall be stabilized as quickly as possible, and channel erosion shall be prevented from runoff caused by the project.	C, O, D
130	Stockpiles	Originally excavated materials shall be stockpiled and used for backfill.	C, O, D
131	Fill	Topsoil from all excavation and construction activities shall be salvaged so it can be reapplied to the disturbed area once construction is completed.	C, O, D

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
132	Fill	Borrow materials shall be obtained only from authorized and permitted sites; existing sites shall be used in preference to new sites.	C, O, D
133	Roads	Abandoned roads and roads no longer needed shall be recontoured and revegetated.	C, O, D
134	Erosion control	Potential soil erosion shall be controlled at culvert outlets with appropriate structures.	C, O, D
135	Erosion control	Catch basins, roadway ditches, and culverts shall be cleaned and maintained regularly.	C, O, D
136	Erosion control	Runoff from slope tops shall be controlled and directed to settling or rapid infiltration basins, and disturbed slopes shall be stabilized as quickly as possible.	C, O, D
137	Erosion control	Sediment-laden waters from disturbed, active areas within the project site shall be retained through the use of barriers and sedimentation devices (e.g., berms, straw bales, sandbags, jute netting, or silt fences).	C, O, D
138	Erosion control	Barriers and sedimentation devices shall be placed around drainages and wetlands to prevent contamination by sediment-laden water.	C, O, D
139	Erosion control	Sediment from barriers and sedimentation devices shall be removed to restore sediment control capacity	C, O, D
140	Erosion control	Routine site inspections shall be conducted to assess the effectiveness and maintenance requirements for erosion and sediment control systems.	C, O, D
141	Operation	All appropriate mitigation measures developed for the construction phase shall be applied to similar activities during the operations phase.	O
142	Revegetation	Project areas are to be replanted with vegetation at spaced intervals to the extent possible to break up areas of exposed soil and reduce soil loss by wind erosion.	C, O, D
143	Revegetation	Native plant communities in disturbed areas shall be restored by natural revegetation or by seeding and transplanting (using weed-free native grasses, forbs, and shrubs), based on BLM recommendations, as early as possible once construction is completed.	C, O, D
144	Reclamation	The original grade and drainage pattern shall be re-established.	C, O, D
145	Reclamation	All areas of disturbed soil shall be reclaimed using weed-free native grasses, forbs, and shrubs. Reclamation activities shall be undertaken as early as possible on disturbed areas.	C, O, D
146	Reclamation	All mitigation measures developed for the construction phase shall be applied to similar activities during the decommissioning/reclamation phase.	D
Transportation			
147	Transportation plans	The project shall be planned to utilize existing roads and utility corridors to the maximum extent feasible and to minimize the number and length/size of new roads, lay-down areas, and borrow areas.	S

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
148	Design	Access roads and on-site roads shall be surfaced with aggregate materials, wherever appropriate.	S, C, O, D
149	Design	Access roads shall be located to follow natural contours and minimize side hill cuts.	S, C, O, D
150	Design	Roads shall be located away from drainage bottoms and avoid wetlands, if practicable.	S, C, O, D
151	Design	Roads shall be designed so that changes to surface water runoff are avoided and erosion is not initiated.	S, C, O, D
152	Design	Access roads shall be located to minimize stream crossings. All structures crossing streams shall be located and constructed so that they do not decrease channel stability or increase water velocity. Operators shall obtain all applicable Federal and State permits.	S, C, O, D
153	Construction traffic	To mitigate impacts related to the daily commutes of construction workers, the operator may be required to implement local road improvements, provide multiple site access locations and routes, stagger work schedules, and implement a ride-sharing or shuttle program.	C, D
154	Oversize vehicles	Obtain vehicle oversize and overweight permits, as appropriate.	C, O, D
155	Traffic	Traffic shall be restricted to the roads developed for the project. Use of other unimproved roads shall be restricted to emergency situations.	C, O, D
156	Traffic	Signs shall be placed along construction roads to identify speed limits, travel restrictions, and other standard traffic control information. To minimize impacts on local commuters, consideration shall be given to limiting construction vehicles traveling on public roadways during the morning and late afternoon commute time. Consideration shall also be given to opportunities for busing of construction workers to the job site to reduce traffic volumes.	C, O, D
157	Operation	To reduce hazards for incoming and outgoing traffic, as well as to expedite traffic flow, the operator may be required to implement traffic control measures, such as intersection realignment coupled with speed limit reduction; the installation of traffic lights and/or other signage; and the addition of acceleration, deceleration, and turn lanes on routes with site entrances.	O
158	Monitoring	Ongoing ground transportation planning shall be conducted to evaluate road use, minimize traffic volume, and ensure that roads are maintained adequately to minimize associated impacts.	O
Visual Resources			
159	Design	Visual information shall be included as a part of the critical due diligence information when determining and selecting development sites and ROW boundaries.	S
160	Design	Consider proposed facility and transmission line visual impacts from relevant viewing angles when selecting building sites and locations. Consider visual impacts from frequent water vapor plumes if cooling towers are proposed.	S

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
161	Design	ROW location, size, and boundary determinations shall consider terrain characteristics and opportunities for full or partial project concealment.	S
162	Design	Other site design elements shall be integrated with the surrounding landscape. Elements to address include minimizing the profile of the ancillary structures, burial of cables, prohibition of commercial symbols, and lighting. Regarding lighting, efforts shall be made to minimize the need for and amount of lighting on ancillary structures.	S
163	Design	Siting shall take advantage of both topography and vegetation as screening devices to restrict views of projects from visually sensitive areas.	S
164	Design	Locating facilities near visually prominent landscape features (e.g., knobs and waterfalls) that naturally draw observers' attention shall be avoided.	S
165	Design	Use commercially available modeling software to identify a "zone" of flicker. Appropriately site and orient wind turbines to minimize shadow flicker occurrences on nearby residences.	S
166	Design	Maintain uniform size and design of turbines (for example, direction of rotation, type of turbine and tower, and height).	S
167	Design	Structures and roads shall be designed and located to minimize and balance cuts and fills. Retaining walls, binwalls, half bridges, and tunnels shall be used to reduce cut and fill.	S
168	Design	Low-profile structures shall be chosen whenever possible to reduce their visibility.	S
169	Design	Openings in vegetation for facilities, structures, roads, and the like shall mimic the size, shape, and characteristics of naturally occurring openings to the extent possible.	S, C
170	Design	Materials and surface treatments shall repeat and/or blend with the existing form, line, color, and texture of the landscape.	S, C
171	Design	Review pre-development visual conditions, inventoried visual quality and integrity shall be reviewed and the visual elements of form, line, color and texture restored to pre-development visual compatibility or to that of the surrounding landscape setting conditions, whichever achieves the greater visual quality and ecologically sound outcome.	S
172	Design	Horizontal and vertical pipeline bending shall be used in place of cut-and-fill activities where feasible.	S, C
173	Construction	All stakes and flagging will be removed from the construction area and disposed of in an approved facility.	C, O, D
174	Surface disturbance	Existing rocks, vegetation, and drainage patterns shall be preserved to the maximum extent possible.	C, O, D

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
175	Surface disturbance	Brush-beating or mowing, or using protective surface matting rather than vegetation removal shall be done where feasible.	C, O, D
176	Surface disturbance	Slash from vegetation removal shall be mulched and spread to cover fresh soil disturbances as part of the revegetation plan. Slash piles shall not be left in sensitive viewing areas.	C, O, D
177	Surface disturbance	Project developers shall reduce visual impacts during construction by clearly delineating construction boundaries and minimizing areas of surface disturbance; preserving vegetation to the greatest extent possible; utilizing undulating surface disturbance edges; stripping, salvaging, and replacing topsoil; contoured grading; controlling erosion; using dust suppression techniques; and restoring exposed soils to their original contour and vegetation.	C O, D
178	Surface disturbance	Visual impacts are lessened when vegetation and ground disturbances are minimized, siting shall take advantage of existing clearings to reduce vegetation clearing and ground disturbance. Linear development (transmission lines, pipelines, roads, etc.) shall follow the edges of clearings (where they would be less conspicuous) rather than passing through the center of clearings.	S, C, O, D
179	Surface disturbance	Road-cut slopes shall be rounded, and the cut-and-fill pitch shall be varied to reduce contrasts in form and line; the slope shall be varied to preserve specimen trees and nonhazardous rock outcroppings.	C, O, D
180	Surface disturbance	Topsoil from cut-and-fill activities shall be segregated and spread on freshly disturbed areas to reduce color contrast and aid rapid revegetation. Topsoil piles shall not be left in sensitive viewing areas.	C, O, D
181	Surface disturbance	Disposal of excess fill material downslope shall be avoided in order to avoid creating color contrast with existing vegetation and soils.	C, O, D
182	Surface disturbance	Excess cut-and-fill materials shall be hauled in or out to minimize ground disturbance and impacts from fill piles.	C, O, D
183	Surface disturbance	Soil disturbance shall be minimized in areas with highly contrasting subsoil color.	C, O, D
184	Surface treatments	Soil borrow areas, cut-and-fill slopes, berms, water bars, and other disturbed areas shall be contoured to approximate naturally occurring slopes, thereby avoiding form and line contrasts with the existing landscape. Contouring to a rough texture would trap seed and discourage off-road travel, thereby reducing associated visual impacts.	C, O, D
185	Surface treatments	Gravel and other surface treatments shall be removed or buried.	C, O, D
186	Facilities	Minimize the number of structures. Combine and carry out activities in one structure, or co-locate structures to share pads, fences, access roads, lighting, and other facilities.	S, O

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
187	Facilities	Turbine arrays and turbine design shall be integrated with the surrounding landscape. Design elements to be addressed include visual uniformity, use of tubular towers, proportion and color of turbines, nonreflective paints, and prohibition of commercial messages on turbines.	S
188	Skylining	Visual "skylining" shall be avoided when structures, transmission lines, and other structures are placed on ridgelines, summits, or other locations where they would be silhouetted against the sky from important viewing locations. Skylining draws visual attention to the project elements and can greatly increase visual contrast. Siting shall take advantage of opportunities to use topography as a backdrop for views of facilities and structures to avoid skylining. Evaluate alternatives and select the least visually intrusive option when linear facilities (e.g. transmission lines) cross over ridgelines.	S
189	Lighting	Minimize the need for and amount of lighting on ancillary structures. Design and commit to install permanent exterior lighting such that: • light fixtures do not cause spill light beyond the project site; b) lighting fixtures are fully shielded, do not cause reflected glare, and use low temperature bulbs; • direct lighting does not illuminate the nighttime sky; • illumination of the project and its immediate vicinity is minimized by including use of motion detectors or other lighting controls to turn lights off except when needed for security and safety; • lighting complies with local policies and ordinances; and • use lighting that meets International Dark Sky Association standards, when feasible.	S, C, O, D
190	Color	Paint the turbines with a non-reflective coating and a uniform color while observing air navigational marking regulations and addressing biological resource concerns.	S, C, O
191	Color	Appropriately colored materials shall be selected for structures, or appropriate stains/coatings shall be applied to blend with the project's backdrop.	S
192	Color	Materials, coatings, or paints having little or no reflectivity shall be used whenever possible.	S, O
193	Color	Grouped structures shall all be painted the same color to reduce visual complexity and color contrast.	C, O
194	Color	Aboveground pipelines shall be painted or coated to match their surroundings.	C, O
195	Color	Culvert ends shall be painted or coated to reduce color contrasts with existing landscape.	C, O, D
196	Color	No paint or permanent discoloring agents will be applied to rocks or vegetation to indicate surveyor construction activity limits.	C, O, D
197	Color	Reduce graveled surfaces visual color contrast with approved color treatment practices.	S, C, O, D

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
198	Glare	Minimize the use of signs and project construction signs; necessary signs shall be made of nonglare materials and utilize unobtrusive colors; reverse sides of signs and mounts shall be painted or coated using the most suitable color selected from the BLM Standard Environmental Color Chart to reduce color contrasts with the existing landscape; however, placement and design of any signs required by safety regulations must conform to these regulations.	S, C, O
199	Transmission	Monopoles may reduce visual impacts more effectively than lattice towers in foreground and middleground views within built or partially built environments, while lattice towers tend to be more appropriate for less developed rural landscapes where the latticework would be more transparent against background textures and colors.	S, O
200	Transmission	All electrical collector lines shall be buried where possible. All electrical collector lines shall be buried in a manner that minimizes additional surface disturbance (e.g., along roads or other paths of surface disturbance).	S, C
201	Transmission	Communication and other local utility cables shall be buried where feasible.	C, O
202	Helicopter use	In visually sensitive areas, air transport capability shall be used to mobilize equipment and materials for clearing, grading, and erecting transmission towers, thereby preserving the natural landscape conditions between tower locations, and reducing the need for permanent and/or temporary access roads.	C, O, D
203	Waste removal	Establish a regular litter pick-up procedure within and around the perimeter of the project site.	C, O, D
204	Waste removal	"Good housekeeping" procedures shall be developed to ensure that the site is kept clean of debris, garbage, fugitive trash or waste, and graffiti; to prohibit scrap heaps and dumps; and to minimize storage yards. Mitigation measures regarding waste management (Section 5.20.3) shall be applied.	C, O, D
205	Maintenance	Maintenance activities shall include dust abatement (in arid environments) and noxious weed control.	O
206	Maintenance	Road maintenance activities shall avoid blading existing forbs and grasses in ditches and adjacent to roads.	O
207	Revegetation	Cut slopes shall be randomly scarified and roughened to reduce texture contrasts with existing landscapes and aid in revegetation.	C, O, D
208	Revegetation	A combination of seeding, planting of nursery stock, transplanting of local vegetation within the proposed disturbance areas, and staging of construction enabling direct transplanting shall be considered. Where feasible, native vegetation shall be used for revegetating, establishing a composition consistent with the form, line, color, and texture of the surrounding undisturbed landscape.	C, O, D

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
209	Revegetation	Edges of revegetated areas shall be feathered to reduce form and line contrasts with the existing landscapes.	C, O, D
210	Revegetation	Stockpiled topsoil shall be reapplied to disturbed areas and the areas revegetated by using a mix of native species selected for visual compatibility with existing vegetation, where feasible, or a mix of native and non-native species if necessary to ensure successful revegetation.	C, O, D
211	Mitigation	The full range of visual best management practices shall be considered, and plans shall incorporate all pertinent BMPs. Visual resource monitoring and compliance strategies shall be included as a part of the project mitigation plans to cover the construction, operation and decommissioning phases.	C, O, D
212	Mitigation	Visual impact mitigation objectives and activities shall be discussed with equipment operators before construction activities begin.	C, O, D
213	Screening	Where screening topography and vegetation are absent, natural-looking earthwork landforms and vegetative or architectural screening shall be used to minimize visual impacts. Vegetative screening can be particularly effective along roadways.	S, O
214	Reclamation	All areas of disturbed soil shall be reclaimed by using weed-free native grasses, forbs, and shrubs representative of the surrounding and intact native vegetation composition and/or use non-native species, if necessary to ensure successful revegetation.	C, O, D
215	Reclamation	Rocks, brush, and forest debris shall be restored whenever possible to approximate pre-existing visual conditions.	C, O, D
216	Reclamation	Interim restoration shall be undertaken during the operating life of the project as soon as possible after disturbances.	C, O, D
Water Resources			
217	Water supply	Use the minimum volume of water necessary for mirror washing. Collecting and recycling the wash water is encouraged.	O
218	Water supply	Water use shall be minimized by implementing conservation practices, such as treating spent wash water and storing it for reuse.	C, O, D
219	Ground water	The creation of hydrologic conduits between two aquifers shall be avoided during foundation excavation and other activities.	C, O, D
220	Water quality	If drilling activities are required as part of site characterization, any drilling fluids or cuttings shall be maintained so that cuttings, fluids, or runoff from storage areas will not come in contact with aquatic habitats. Temporary impoundments for storing drilling fluids and cuttings shall be lined to minimize infiltration of runoff into groundwater or surface water.	C, O, D

Table B-4 *(continued)*
Best Management Practices

No.	Topic	Description of Measure	Phase
221	Water quality	Washing equipment or vehicles in streams and wetlands shall be avoided.	C, O, D
222	Water quality	Project developers shall avoid or minimize and mitigate the degradation of water quality (e.g., chemical contamination, increased salinity, increased temperature, decreased dissolved oxygen, and increased sediment loads) that could result from construction activities. Water quality in areas adjacent to or downstream of development areas shall be monitored during the life of the project to ensure that water quality is protected.	C, O, D
223	Stormwater	Construction activities shall avoid land disturbance in ephemeral washes and dry lakebeds; any unavoidable disturbance will be minimized. Stormwater facilities will be designed to route flow around the facility and maintain pre-project hydrographs.	C, O, D
224	Stormwater	When stream or wash crossings are constructed, culverts or water conveyances for temporary and permanent roads shall be designed to comply with county standards or to accommodate the runoff of a 100-year storm, whichever is larger.	C, O, D
225	Stormwater	Geotextile mats shall be used to stabilize disturbed channels and stream banks. Earth dikes, swales, and lined ditches shall be used to divert work-site runoff that would otherwise enter a disturbed stream.	C, O, D
226	Stormwater	Special construction techniques shall be used, where applicable, in areas of erodible soil, alluvial fans, and stream channel/wash crossings.	C, O, D
227	Reclamation	All management plans, mitigation measures, and stipulations developed for the construction phase shall be applied to similar activities during the decommissioning/reclamation phase.	D
Wild Horses and Burros			
228	Design	Access roads shall be appropriately constructed, improved, and maintained and should employ appropriate signs to minimize potential horse and burro collisions. Fences should be built (as practicable) to exclude wild horses and burros from all project facilities, including all water sites built for the development of facilities and roadways.	S, C, O, D
Wildfire			
229	Safety	The effectiveness of developing and adhering to a hazardous materials and waste management plan and a fire safety plan, requiring a facility design to include isolation valves to limit HTF releases (where applicable), and providing worker training shall be considered in reducing fire risks.	S

This page intentionally left blank.