

1 **A.2 BLM PROPOSED SOLAR ENERGY PROGRAM**

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4 **A.2.1 Proposed Solar Energy Development Policies**

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6 For this Final Solar PEIS, the proposed solar energy development policies are presented  
7 as part of the Solar Energy Program in Chapter 2. The ROW authorization policies are presented  
8 in Section 2.2.1.1. The authorization policies for projects within solar energy zones (SEZs) are  
9 presented in Section 2.2.2.1. The variance process for ROW applications submitted in variance  
10 areas is presented in Section 2.2.2.1.  
11

12  
13 **A.2.2 Proposed Programmatic Design Features**

14  
15 When incorporated into BLM’s program in the Record of Decision (ROD), the following  
16 proposed programmatic design features will be required to be applied to all solar energy  
17 applications submitted to the BLM for consideration (both within and outside of solar energy  
18 zones (SEZs). Because of site-specific circumstances, some features may not apply to some  
19 projects (e.g., a resource is not present on a given site) and/or may require slight variations from  
20 what is described in this section (e.g., a larger or smaller protective area). Applicants will be  
21 required to discuss any proposed variations with BLM staff. All variations in programmatic  
22 design features will require appropriate analysis and disclosure as part of future project  
23 authorizations. It is anticipated that variations in the design features presented will be approved  
24 in very limited circumstances. Those design features that do not apply to a given project will  
25 need to be described as part of the project case file along with an appropriate rationale.  
26 Additional mitigation measures may be identified and required during individual project  
27 development and environmental review. The determination of adequate application of the design  
28 features for specific projects will remain with the BLM’s Authorized Officer.  
29

30 The proposed design features are presented by resource area and by project phase  
31 (i.e., general; site characterization, siting, and design construction; operations and maintenance;  
32 and reclamation and decommissioning). These design features were based on the potentially  
33 applicable mitigation measures given by resource area in Chapter 5 of the Draft Solar PEIS. All  
34 Chapter 5 potentially applicable mitigation measures have been carried forward as proposed  
35 programmatic design features of the Draft Solar PEIS. [Note: Citations for applicable agency  
36 guidance documents are given in Chapter 5; new citations are found in Section A.2.2.23.] For the  
37 Final Solar PEIS, the potentially applicable mitigation measures are not repeated in Chapter 5.  
38

39 Many of the proposed programmatic design features indicate the need for project-specific  
40 mitigation plans (see Table A.2-1). The content of these plans will depend on specific project  
41 requirements and locations, and their applicability and effectiveness needs to be evaluated at the  
42 project-specific level. In the early stages of the development of required plans, project  
43 developers shall coordinate with appropriate federal, state, and local agencies that regulate  
44 activities that affect resources both appurtenant and adjacent to the proposed development to  
45 determine what permits or approvals may be needed for construction and operation of a solar  
46

**TABLE A.2-1 Plans Specified as Elements of the Proposed Design Features<sup>a</sup>**

Plan Name	Applicable Design Features <sup>b</sup>
Construction and Operation Waste Management Plan	HMW1-2
Cultural Resources Management and Mitigation Plan	CR1-2, CR2-6, CR2-8
Decommissioning and Site Reclamation Plan	ER4-1, VR2-50, VR4-1, VR4-3
Drainage, Erosion, and Sedimentation Control Plan	SR2-12
Dust Abatement Plan	WR2-23, ER1-5, AQC1-1, AQC-2, AQC-3, AQC-4
Ecological Resource Mitigation and Monitoring Plan	ER1-24
Environmental Justice Plan	EJ1-1
Fire Management and Protection Plan	WF2-1, ER1-31, HMW1-3, HS1-12
Glint and Glare Assessment, Mitigation, and Monitoring Plan	VR1-1, HS1-9
Hazardous Materials and Waste Management Plan	WR2-25, HMW1-1
Historic Properties Treatment Plan	CR1-2, CR2-6
Integrated Vegetation Management Plan	WF1-2, WR2-24, ER1-20, ER2-39, VR2-54
Lighting Plan	VR1-2
Native American Consultation Plan	NA1-1
Nuisance Animal and Pest Control Plan	WR2-24, ER1-18, ER1-19, ER1-24, ER1-40, ER3-8, HMW1-4
Paleontological Resources Management Plan	P1-3
Spill Prevention and Emergency Response Plan	SR1-14, WR1-4, WR2-25, ER1-30, HMW1-5
Special Status Species Clearance and Translocation Plan	ER1-24
Stormwater Management Plan	WR1-3, WR2-25
Traffic Management Plan	HS1-8
Trash Abatement Plan	ER1-32
Unanticipated Burial Contingency Plan	NA1-4
Visual Resource Monitoring and Compliance Plan	VR2-14, VR4-11
Water Resources Monitoring and Mitigation Plan	WR1-12, WR3-1, WR4-3, ER1-27
Worker Education and Awareness Plan	LR1-6, RG1-3, WHB1-2, WF1-3, ER1-2, P1-4, CR1-6

<sup>a</sup> The need for each plan will be determined on a project-specific basis.

<sup>b</sup> The design features specifying the need for individual plans are listed in Sections A.2.2-1 through A.2.2-22.

1 facility. The BLM's Authorized Officer would need to determine the adequacy of such plans and  
2 their updates at the time of permitting specific projects.

3  
4 In the very early stages of the development of siting and design plans, project developers  
5 shall coordinate with appropriate federal, state, and local agencies that regulate activities that  
6 affect land and water resources both appurtenant and adjacent to the proposed development to  
7 determine what permits or approvals may be needed for construction and operation of a solar  
8 facility.

9  
10  
11 **A.2.2.1 Design Features for Lands and Realty**

12  
13 The following design features were identified to avoid, reduce, and/or mitigate potential  
14 impacts to lands and realty from solar development identified and discussed in Sections 5.2.1 and  
15 5.2.2 of the Draft and Final Solar PEIS.

16  
17  
18 **A.2.2.1.1 General**

19  
20 **LR1-1** Legal access to private, state, and public lands surrounding the solar facilities  
21 shall be retained to avoid creating areas that are inaccessible to the public  
22 and/or that would be difficult to manage. The effect on the manageability and  
23 uses of public lands around boundaries of solar energy facilities shall be  
24 considered during the environmental analysis of project applications.

25  
26 **LR1-2** Coordination with federal, state, and county agencies; Tribes; property  
27 owners; and other stakeholders shall be accomplished as early as possible in  
28 the planning process to identify potentially significant land use conflicts and  
29 issues and state and local rules that govern solar energy development.  
30 Significant issues that are raised, and potential modifications to proposed  
31 projects to eliminate or mitigate these issues, shall be considered in the  
32 environmental analysis of the project application.

33  
34 **LR1-3** Where there are existing BLM ROW authorizations within solar energy  
35 development areas, pursuant to Title 43, Part 2807.14 of the *Code of Federal*  
36 *Regulations* (43 CFR 2807.14), the BLM will notify ROW holders that an  
37 application that might affect their existing ROW has been filed and request  
38 their comments. Early discussion will occur with existing ROW holders to  
39 insure their rights are protected and that any issues are resolved.

40  
41 **LR1-4** If a proposed action (including transmission, utilities, access, or other  
42 ancillary project facilities.) might have an adverse effect on prime and unique  
43 farmland, this possibility must be discussed in the associated environmental  
44 analysis, along with a consideration of alternatives or appropriate mitigation  
45 measures.

1 **LR1-5** If a proposed action is within one-quarter mile of any project boundary, a  
2 Chain of Survey Certificate, conformed to the Departmental standard, must  
3 be issued. In some cases, Land Description Reviews, Certificates of  
4 Inspection and Possession, Boundary Assurance Certificates, resurveys,  
5 re-monumentation, and/or referencing of PLSS corners may be required  
6 before the start of any action.  
7

8 **LR1-6** Personnel on project site must be made aware of regional or local laws and  
9 rules that they are subject to but are not derived from a specific project  
10 design feature. Laws and rules that they may be subject to are international  
11 borders, limitations on the removal of salable materials from a project site for  
12 personal use such as stone or wood, and use of vehicles off project site in  
13 limited access areas. Awareness of the laws and rules may be incorporated  
14 into a Worker Education and Awareness Plan (WEAP) that is provided to all  
15 project personnel prior to entering the project work site. The WEAP shall be  
16 provided on a regular basis, covering multiple resources, to ensure the  
17 awareness of key mitigation efforts of the project work site during all phases  
18 of the projects life. The base information the WEAP provides shall be  
19 reviewed and approved by BLM prior to the issuance of a Notice to Proceed  
20 and incorporate adaptive management protocols for addressing changes over  
21 the life of the project, should they occur.  
22  
23

24 ***A.2.2.1.2 Site Characterization, Siting, and Design Construction***  
25

26 **LR2-1** Where a designated transmission corridor is located within the area of  
27 proposed solar energy development project, the need for future transmission  
28 capacity in the corridor will be reviewed to determine whether the corridor  
29 should be excluded from solar development or whether the capacity of the  
30 designated transmission corridor can be reduced. Partially relocating the  
31 corridor to retain the current planned capacity will also be an option to be  
32 considered, as will relocating the solar project outside the designated  
33 corridor.  
34

35 **LR2-2** Evidence of the Public Land Survey System (PLSS) and related Federal  
36 property boundaries will be identified and protected prior to commencement  
37 of any ground-disturbing activity. This will be accomplished by contacting  
38 Bureau Land Management (BLM) Cadastral Survey to coordinate data  
39 research, evidence examination and evaluation, and locating, referencing or  
40 protecting monuments of the PLSS and related land boundary markers from  
41 destruction. In the event of obliteration or disturbance of the Federal  
42 boundary evidence the responsible party shall immediately report the  
43 incident, in writing, to the Authorizing Official. BLM Cadastral Survey will  
44 determine how the marker is to be restored. In rehabilitating or replacing the  
45 evidence the responsible party will be instructed to use the services of a  
46 Certified Federal Surveyor (CFedS), procurement shall be per qualification

1 based selection, or reimburse the BLM for costs. All surveying activities will  
2 conform to the Manual of Surveying Instructions (Manual) and appropriate  
3 State laws and regulations. Local surveys will be reviewed by Cadastral  
4 Survey before being finalized or filed in the appropriate State or county  
5 office. The responsible party shall pay for all survey, investigation, penalties,  
6 and administrative costs.  
7

8 **LR2-3** Consolidation of access and other supporting infrastructure shall be required  
9 for single projects and for cases in which there is more than one project in  
10 close proximity to another in order to maximize the efficient use of public  
11 land and minimize impacts.  
12

### 13 14 **A.2.2.2 Design Features for Specially Designated Areas and Lands with 15 Wilderness Characteristics**

16  
17 The following design features were identified to avoid, reduce, and/or mitigate potential  
18 impacts to specially designated areas and lands with wilderness characteristics from solar  
19 development identified and discussed in Sections 5.3.1 and 5.3.2 of the Draft and Final  
20 Solar PEIS.  
21

#### 22 23 ***A.2.2.2.1 General***

24  
25 **LWC1-1** Protection of existing values of specially designated areas and lands with  
26 wilderness characteristics shall be evaluated during the environmental  
27 analysis of solar energy project applications, and the results shall be  
28 incorporated into the project planning and design to minimize off-site  
29 impacts.  
30

#### 31 32 ***A.2.2.2.2 Site Characterization, Siting, and Design Construction***

33  
34 **LWC2-1** Solar facilities shall be located and designed to minimize impacts on  
35 specially designated areas and lands with wilderness characteristics.<sup>1</sup>  
36

37 **LWC2-2** Any lands that are within or near proposed solar energy facilities that have  
38 not been recently inventoried for wilderness characteristics or any lands that  
39 have been identified in any citizen's wilderness proposal shall be inventoried  
40 to determine if they possess wilderness characteristics as part of the  
41 processing of a solar energy ROW application. If lands with wilderness  
42 characteristics exist within or near a proposed solar energy facility, impacts  
43 on these lands will be evaluated as part of the NEPA process evaluating the  
44 proposed facility.

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<sup>1</sup> See Section 4.3 for details on areas included in these categories.

1           **A.2.2.3 Design Features for Rangeland Resources—Grazing**  
2

3           The following design features were identified to avoid, reduce, and/or mitigate potential  
4 impacts to grazing from solar development identified and discussed in Sections 5.4.1.1 and  
5 5.4.1.2 of the Draft and Final Solar PEIS.  
6

7  
8           **A.2.2.3.1 General**  
9

10 **RG1-1**      Grazing permittees that may be affected by a solar energy project shall be  
11 contacted early in project planning to explore whether modifications could be  
12 made to a proposed solar energy project to minimize impacts on grazing use.  
13

14 **RG1-2**      Wherever there are reductions in grazing use caused by development of solar  
15 energy facilities, opportunities for mitigating this shall be considered as part  
16 of the NEPA process evaluating the solar energy proposal. Alternatively,  
17 retiring the displaced grazing use shall also be considered.  
18

19 **RG1-3**      Key elements to mitigate the impacts to grazing shall be incorporated into a  
20 Worker Education and Awareness Plan (WEAP) that is provided to all  
21 project personnel prior to entering the project work site. The WEAP shall be  
22 provided on a regular basis, covering multiple resources, to ensure the  
23 awareness of key grazing mitigation efforts of the project work site during all  
24 phases of the projects life. The base information the WEAP provides shall be  
25 reviewed and approved by BLM prior to the issuance of a Notice to Proceed  
26 and incorporate adaptive management protocols for addressing changes over  
27 the life of the project, should they occur.  
28  
29

30           **A.2.2.3.2 Site Characterization, Siting, and Design Construction**  
31

32 **RG2-1**      Access roads associated with solar energy development shall be constructed,  
33 improved, and maintained to minimize their impact on grazing operations.  
34 Road design shall include fencing, cattle guards, and speed control and  
35 information signs where appropriate.  
36  
37

38           **A.2.2.4 Design Features for Wild Horses and Burros**  
39

40           The following design features were identified to avoid, reduce, and/or mitigate potential  
41 impacts to wild horses and burros from solar development identified and discussed in  
42 Section 5.4.2.1 and 5.4.2.2 of the Draft and Final Solar PEIS.  
43  
44

1                    **A.2.2.4.1 General**

2  
3    **WHB1-1**    Activities of project developers shall be coordinated with the BLM and other  
4                    stakeholders to ensure that impacts on wild horses and burros and their  
5                    management areas are minimized. Issues to be addressed could include the  
6                    installation of fencing and access control, provision for movement corridors,  
7                    delineation of open range, traffic management (e.g., vehicle speeds), and  
8                    access to water sources.

9  
10   **WHB1-2**    Key elements to mitigate the impacts to Wild Horse and Burros shall be  
11                    incorporated into a Worker Education and Awareness Plan (WEAP) that is  
12                    provided to all project personnel prior to entering the project work site. The  
13                    WEAP shall be provided on a regular basis, covering multiple resources, to  
14                    ensure the awareness of key wild horse and burro mitigation efforts of the  
15                    project work site during all phases of the projects life. The base information  
16                    the WEAP provides shall be reviewed and approved by BLM prior to the  
17                    issuance of a Notice to Proceed and incorporate adaptive management  
18                    protocols for addressing changes over the life of the project, should they  
19                    occur.

20  
21  
22                    **A.2.2.4.2 Site Characterization, Siting, and Design Construction**

23  
24   **WHB2-1**    Access roads shall be appropriately constructed, improved, and maintained  
25                    and employ signs to minimize potential horse and burro collisions. Fences  
26                    shall be built to exclude wild horses and burros from all project facilities,  
27                    including all water sites built for the development of facilities and roadways  
28                    where appropriate.

29  
30  
31                    **A.2.2.5 Design Features for Wildland Fire**

32  
33                    The following design features were identified to avoid, reduce, and/or mitigate potential  
34                    impacts from wildland fires that could be impacted by solar development as identified and  
35                    discussed in Sections 5.4.3.1 and 5.4.3.2 of the Draft and Final Solar PEIS.

36  
37  
38                    **A.2.2.5.1 General**

39  
40   **WF1-1**        In areas susceptible to wildland fire, coordination with the BLM and local  
41                    fire organizations shall be required early in the project planning process to  
42                    determine design features to be incorporated into the design of the project  
43                    to prevent an increase in the frequency of wildland fire.

44  
45   **WF1-2**        An Integrated Vegetation Management Plan designed to prevent the  
46                    establishment of non-native, invasive species on the solar energy facility and

1 along transmission line ROWs and roads shall be developed and  
2 implemented to minimize the potential for increasing the frequency of  
3 wildland fires.

4  
5 **WF1-3** The effectiveness of developing and implementing a Fire Management and  
6 Protection Plan and providing worker training to reduce fire risks shall be  
7 evaluated.

8  
9 **WF1-4** Key elements to mitigate the impacts to fire management shall be  
10 incorporated into a Worker Education and Awareness Plan (WEAP) that is  
11 provided to all project personnel prior to entering the project work site. The  
12 WEAP shall be provided on a regular basis, covering multiple resources, to  
13 ensure the awareness of key fire management mitigation efforts of the project  
14 work site during all phases of the projects life. The information provided in  
15 the WEAP shall be reviewed and approved by BLM prior to the issuance of a  
16 Notice to Proceed and incorporate adaptive management protocols for  
17 addressing changes over the life of the project, should they occur.

#### 18 19 20 ***A.2.2.5.2 Site Characterization, Siting, and Design Construction***

21  
22 **WF2-1** The ROWs for solar facilities shall be large enough to ensure there is a  
23 sufficient fire break inside the ROW so there would be no threat to facilities  
24 from either a wildland fire approaching from outside the ROW or a fire  
25 moving from inside to outside the ROW. This distance shall be determined  
26 through coordination with fire management staff, and actions, both active and  
27 passive (e.g., vegetation manipulation), shall be undertaken specifically to  
28 remove the need for protective responses by the BLM, state, and local fire  
29 organizations and addressed in the Fire Management and Protection Plan.

#### 30 31 32 ***A.2.2.6 Design Features for Recreation Impacts***

33  
34 The following design features were identified to avoid, reduce, and/or mitigate potential  
35 recreation impacts from solar development identified and discussed in Sections 5.5.1 and 5.5.2 of  
36 the Draft and Final Solar PEIS.

##### 37 38 39 ***A.2.2.6.1 General***

40  
41 **R1-1** Public access through or around solar facilities shall be retained to permit  
42 continued use of public lands and non-BLM administered lands.

43  
44 **R1-2** Replacement of acreage lost for off-highway vehicle use shall be considered  
45 as part of the analysis of project-specific impacts. Any process for  
46 designating a replacement route or use area would include the consideration



1 of the designation criteria for routes as specified in 43 CFR 8342.1 and  
2 would be consistent with existing land use plans.  
3  
4

5 ***A.2.2.6.2 Site Characterization, Siting, and Design Construction***  
6

7 **R2-1** Solar facilities shall not be placed in areas of unique or important recreation  
8 resources. Areas need not be specially designated to fall under this definition.  
9

10  
11 ***A.2.2.7 Design Features for Military and Civilian Aviation***  
12

13 The following design features were identified to avoid, reduce, and/or mitigate potential  
14 impacts to military and civilian aviation from solar development identified and discussed in  
15 Sections 5.6.1 and 5.6.2 of the Draft and Final Solar PEIS.  
16  
17

18 ***A.2.2.7.1 General***  
19

20 **MCA1-1** Decisions regarding the location of solar facilities and transmission facilities  
21 within or near military training routes or near military or civilian airports  
22 shall be coordinated with military and civilian airspace managers early in the  
23 processing of solar energy project applications, in order to identify and  
24 mitigate potential impacts on military and civilian airport and airspace use.  
25 Any potential hazards associated with the height of solar energy facilities,  
26 glint and glare from reflective surfaces, or other effects potentially associated  
27 these facilities, shall be evaluated through coordination with civilian and  
28 military airport operators. Proposed construction of any facility that is 200 ft  
29 (~61 m) or taller must be submitted to the Federal Aviation Administration  
30 (FAA) for evaluation of safety hazards.  
31

32 **MCA1-2** The FAA shall be contacted early in the project planning to determine if there  
33 might be any potential impacts on aviation and if any mitigation might be  
34 required to protect military or civilian aviation use.  
35

36 **MCA1-3** As part of the evaluation of impacts from the development of solar energy  
37 facilities, their potential for impacting the operation of existing military  
38 installations, either because they displace species onto an installation or  
39 because they increase the significance of special status species populations  
40 on the installation, shall be included as part of the environmental impact  
41 analysis of the solar energy project.  
42  
43

1           **A.2.2.8 Design Features for Soil Resources and Geologic Hazards**  
2

3           The following design features were identified to avoid, reduce, and/or mitigate potential  
4 soil impacts from solar development and potential geologic hazards identified and discussed in  
5 Sections 5.7.1 and 5.7.2 (soil impacts) and 5.7.3 (geologic hazards) of the Draft and Final  
6 Solar PEIS.  
7

8  
9           **A.2.2.8.1 General**

- 10  
11 **SR1-1**      Potential soil erosion shall be controlled at culvert outlets with appropriate  
12 structures.  
13  
14 **SR1-2**      Abandoned roads and roads no longer needed shall be subsoiled to increase  
15 infiltration and reduce soil compaction, then recontoured and revegetated.  
16  
17 **SR1-3**      Ground-disturbing activities shall be minimized, especially during the rainy  
18 season.  
19  
20 **SR1-4**      Originally excavated materials shall be used for backfill as appropriate.  
21  
22 **SR1-5**      The speed of vehicles and equipment on unpaved surfaces shall be controlled  
23 to reduce dust emissions (and potential collisions with wildlife).  
24  
25 **SR1-6**      Runoff from slope tops shall be controlled and directed to settling or rapid  
26 infiltration basins (temporarily) until disturbed slopes are stabilized.  
27 Disturbed slopes shall be stabilized as quickly as possible.  
28  
29 **SR1-7**      Drainage crossings shall be stabilized as quickly as possible, and channel  
30 erosion from runoff caused by the project shall be prevented.  
31  
32 **SR1-8**      Sediment-laden waters from disturbed, active areas within the project site  
33 shall be retained through the use of barriers and sedimentation devices  
34 (e.g., berms, straw bales, sandbags, jute netting, or silt fences). Such barriers  
35 and devices shall not be installed in wildlife crossing areas.  
36  
37 **SR1-9**      Barriers and sedimentation devices shall be placed around drainages and  
38 wetlands to prevent contamination by sediment-laden water.  
39  
40 **SR1-10**     Sediment from barriers and sedimentation devices shall be removed to  
41 restore sediment-control capacity.  
42  
43 **SR1-11**     Routine site inspections shall be conducted to assess the effectiveness and  
44 maintenance requirements for erosion and sediment control systems.  
45

1 **SR1-12** Barriers and sedimentation devices shall be maintained, repaired, or replaced  
2 as necessary to ensure optimum control.

3  
4 **SR1-13** A Spill Prevention and Emergency Response Plan to identify sources,  
5 locations, and quantities of potential chemical releases (through spills, leaks,  
6 or fires) and define response measures and notification requirements shall be  
7 developed and followed to reduce the potential for soil contamination. The  
8 plan shall also identify individuals and their responsibilities for implementing  
9 the plan.

10  
11  
12 ***A.2.2.8.2 Site Characterization, Siting, and Design Construction***

13  
14 **SR2-1** The footprint of disturbed areas—including the number and size/length of  
15 roads, fences, borrow areas, and laydown and staging areas—shall be  
16 minimized. The boundaries of disturbed area footprints shall be clearly  
17 delineated on the ground (e.g., through the use of construction fencing).

18  
19 **SR2-2** Project structures and facilities shall be sited to avoid disturbance in areas  
20 with existing biological soil crusts to the extent possible.

21  
22 **SR2-3** Project areas shall be replanted with native vegetation at spaced intervals to  
23 the extent possible to break up areas of exposed soil and reduce soil loss by  
24 wind erosion.

25  
26 **SR2-4** Land disturbance (including crossings) in natural drainage systems and  
27 groundwater recharge zones, specifically ephemeral washes and dry lake  
28 beds, are to be avoided. Any structures crossing drainages must be located  
29 and constructed so that they do not decrease channel stability or increase  
30 water volume or velocity. Developers shall obtain all applicable federal and  
31 state permits.

32  
33 **SR2-5** Solar facilities or components (e.g., heliostats, panels, dishes, and troughs)  
34 shall not be placed in natural drainage ways.

35  
36 **SR2-6** Adequate space (i.e., setbacks) between solar facilities and natural washes is  
37 to be maintained to preserve their hydrological function and provide a buffer  
38 for flood control.

39  
40 **SR2-7** Existing roads, disturbed areas, and borrow pits shall be used. In addition, all  
41 borrow pits shall be identified beforehand and included in the NEPA direct  
42 and indirect analyses. If new roads are necessary, they shall be designed and  
43 constructed to the appropriate road design standards, such as those described  
44 in BLM Manual 9113.

- 1 **SR2-8** New roads shall be designed to follow natural land contours and avoid or  
2 minimize hill cuts in the project area and avoid existing desert washes.  
3 Siting of new roads and walking trails (if any) is to be consistent with the  
4 designation criteria specified by the BLM in 43 CFR 8342.1.  
5
- 6 **SR2-9** Ground-disturbing geotechnical studies (e.g., geotechnical drilling)  
7 shall adhere to the permitting requirements specified by the BLM in  
8 43 CFR Part 2800 or 2920 as appropriate and address geologic hazards when  
9 appropriate.  
10
- 11 **SR2-10** Roads shall be designed on the basis of local meteorological conditions, soil  
12 moisture, and erosion potential in order to avoid erosion and changes in  
13 surface water runoff.  
14
- 15 **SR2-11** Temporary roads shall be designed with eventual reclamation in mind.  
16
- 17 **SR2-12** Areas with unstable slopes shall be avoided, and local factors that can cause  
18 slope instability (e.g., groundwater conditions, precipitation, earthquake  
19 activity, slope angles, and the dip angles of geologic strata) shall be identified  
20 and addressed in the Drainage, Erosion and Sedimentation Control Plan.  
21
- 22 **SR2-13** Excessive grades shall be avoided on roads, road embankments, ditches, and  
23 drainages, especially in areas with erodible soils.  
24
- 25 **SR2-14** The creation of excessive slopes shall be avoided during site preparation and  
26 construction. As appropriate, special construction techniques are to be  
27 considered and used in areas of steep slopes, erodible soil, and drainage  
28 ways.  
29
- 30 **SR2-15** Construction shall be conducted in stages to limit the areas of exposed soil at  
31 any given time. For example, only land that will be actively under  
32 construction in the near term (e.g., within the next 6 to 12 months) shall be  
33 cleared of vegetation.  
34
- 35 **SR2-16** Construction activities shall take place over as short a timeframe as possible  
36 once ground disturbance has occurred. Activities over long timeframes shall  
37 continue using measures to limit wind and water erosion to the extent  
38 possible.  
39
- 40 **SR2-17** Construction traffic shall avoid unpaved surfaces, reducing compaction, and  
41 lower driving speeds to lessen fugitive dust emissions.  
42
- 43 **SR2-18** The clearing and disturbing of sensitive areas (e.g., steep slopes and natural  
44 drainages) shall be avoided outside the construction zone. The construction  
45 zone boundaries shall be clearly delineated on the ground (e.g., through the

- 1 use of construction fencing) so as not to conflict with other resource  
2 concerns.  
3
- 4 **SR2-19** Ground disturbance from construction-related activities, such as vehicle and  
5 foot traffic, shall avoid areas with intact biological soil crusts and desert  
6 pavement to the extent possible. For cases in which impacts cannot be  
7 avoided, soil crusts will be salvaged and restored on the basis of  
8 recommendations by BLM once construction has been completed.  
9
- 10 **SR2-20** The creation of excessive slopes shall be avoided during site preparation and  
11 construction (e.g., during excavation). Special construction techniques shall  
12 be considered and used, where appropriate, in areas of steep slopes, erodible  
13 soil, and stream channel crossings.  
14
- 15 **SR2-21** Electrical lines from solar collectors shall be buried along existing features  
16 (e.g., roads or other paths of disturbance) to minimize the overall area of  
17 surface disturbance whenever possible. As feasible, these lines shall be  
18 enclosed in conduit to minimize the potential for animals to chew through the  
19 electrical lines.  
20
- 21 **SR2-22** Borrow materials shall be obtained only from authorized and permitted sites.  
22
- 23 **SR2-23** Construction grading shall be conducted in compliance with industry practice  
24 (e.g., the American Society for Testing and Materials [ASTM] international  
25 standard methods) and other requirements (e.g., BLM and/or local grading  
26 and construction permits), as appropriate.  
27
- 28 **SR2-24** Erosion-control structures (e.g., rock lining or apron) shall be added at  
29 culvert outlets to reduce flow velocity and minimize the potential for  
30 scouring.  
31
- 32 **SR2-25** Temporary stabilization of disturbed areas that are not actively under  
33 construction shall occur throughout the construction phase. Soil stabilization  
34 methods, such as erosion matting blankets, or soil aggregation (binding), are  
35 examples of measures that should be used to limit wind erosion and dust  
36 emissions, as site conditions warrant.  
37
- 38 **SR2-26** Water or other stabilizing agents shall be used to wet roads in active  
39 construction areas and laydown areas in order to minimize the windblown  
40 erosion of soil.  
41
- 42 **SR2-27** Topsoil from all excavation and construction activities shall be salvaged so it  
43 can be reapplied to the disturbed area once construction is completed.  
44
- 45 **SR2-28** Native plant communities in disturbed areas shall be restored by natural  
46 revegetation or by seeding and transplanting (using weed-free native grasses,

1 forbs, and shrubs), on the basis of BLM recommendations, as early as  
2 possible once construction is completed.

3  
4 **SR2-29** Construction on wet soils shall be avoided.

5  
6 **SR2-30** Appropriate studies shall be performed to determine whether construction  
7 and operation of a solar facility would affect the eolian processes that  
8 maintain any nearby sand dunes, if applicable.

9  
10 Design features to address geologic hazards:

11  
12 **GH2-1** Project structures shall be built in accordance with the design-basis  
13 recommendations in the project-specific geotechnical investigation report.

14  
15 **GH2-2** Structure designs must meet the requirements of all applicable federal, state,  
16 and county permits and building codes.

17  
18 **GH2-3** In areas of high seismic activity (especially those having soils with a high  
19 liquefaction potential) or in areas that encompass 100-year floodplains,  
20 consideration shall be given to changing the location or scope of the  
21 proposed project.

22  
23  
24 ***A.2.2.8.3 Operations and Maintenance***

25  
26 **SR3-1** All design features developed for the construction phase shall be applied to  
27 similar activities during the operations phase.

28  
29 **SR3-2** The area disturbed by operation of a solar energy project shall be minimized  
30 (e.g., by using existing roads).

31  
32 **SR3-3** Catch basins, roadway ditches, and culverts shall be cleaned and maintained  
33 regularly.

34  
35 **SR3-4** Permanent stabilization of disturbed areas shall occur during final grading  
36 and landscaping of the site and be maintained through the life of the facility.

37  
38  
39 ***A.2.2.8.4 Reclamation and Decommissioning***

40  
41 **SR4-1** All design features developed for the construction phase shall be applied to  
42 similar activities during the decommissioning/reclamation phase.

43  
44 **SR4-2** To the extent possible, the original grade and drainage pattern shall be re-  
45 established.

46

1 **SR4-3** Native plant communities in disturbed areas shall be restored by natural  
2 revegetation or by seeding and transplanting (using weed-free native grasses,  
3 forbs, and shrubs), on the basis of BLM recommendations, as early as  
4 possible once decommissioning is completed.  
5  
6

#### 7 **A.2.2.9 Design Features for Mineral Resources**

8

9 The following design features were identified to avoid, reduce, and/or mitigate potential  
10 impacts to mineral resources from solar development identified and discussed in Sections 5.8.1  
11 and 5.8.2 of the Draft and Final Solar PEIS.  
12  
13

##### 14 **A.2.2.9.1 General**

15

16 **MR1-1** Where valid mining claims or mineral leases exist, early consultation with  
17 claim or lease holders shall be initiated to determine whether it would be  
18 possible to locate solar facilities in or near these areas in such a way as to  
19 avoid adverse effects on mineral development activities.  
20

21 **MR1-2** All solar energy development ROWs will contain the stipulation that BLM  
22 retains the right to issue oil and gas or geothermal leases with a stipulation of  
23 no surface occupancy within the ROW area. Upon designation, SEZs will be  
24 classified as no surface occupancy areas for oil and gas and geothermal  
25 leasing.  
26  
27

##### 28 **A.2.2.9.2 Site Characterization, Siting, and Design Construction**

29

30 **MR2-1** Transmission lines shall be located to avoid conflicts with mining activities  
31 in areas with active mineral development.  
32  
33

#### 34 **A.2.2.10 Design Features for Water Resources**

35

36 The following design features were identified to avoid, reduce, and/or mitigate potential  
37 soil impacts to water resources from solar development identified and discussed in Sections 5.9.1  
38 and 5.9.2 of the Draft and Final Solar PEIS.  
39  
40

##### 41 **A.2.2.10.1 General**

42

43 The following activities and objectives shall occur or be considered in order to minimize  
44 impacts on water resources. They are to be done in coordination with the appropriate local, state,  
45 and federal regulating agencies. The following items relate to quantification and characterization  
46 of the existing hydrology, land alteration issues, water rights, and water quality.

1 **WR1-1** A Drainage, Erosion, and Sedimentation Control Plan shall be developed that  
2 ensures protection of water quality and soil resources, demonstrates no  
3 increase in off-site flooding potential, and includes provisions for stormwater  
4 and sediment retention on the project site. The plan shall identify site surface  
5 water runoff patterns and develop mitigation measures that prevent excessive  
6 and unnatural soil deposition and erosion throughout and downslope of the  
7 project site and project-related construction areas. The plan shall achieve the  
8 following:

- 9
- 10 – Runoff from parking lots, roofs, or other impervious surfaces shall be  
11 directed to retention basins prior to being released down gradient of the  
12 site;
- 13
- 14 – Any landscaping used for stormwater treatment shall require little or no  
15 irrigation and would be recessed to create retention basins/areas used to  
16 capture runoff;
- 17
- 18 – The amount of area covered by impervious surfaces shall be reduced  
19 through the use of permeable pavement or other pervious surfaces; and
- 20
- 21 – Natural drainages and a pre-project hydrograph shall be maintained for  
22 the area.
- 23

24 **WR1-2** A Stormwater Management Plan shall be developed for the site to ensure  
25 compliance with applicable regulations and prevent off-site migration of  
26 contaminated stormwater, changes in pre-project storm hydrographs, or  
27 increased soil erosion.

- 28
- 29 – Siting in identified 100-year floodplains shall not be allowed within the  
30 development;
- 31
- 32 – Hydrologic analysis and modeling shall be conducted to define the  
33 100-year, 24-hour rainfall for the project area and calculate projected  
34 runoff from this storm at the site;
- 35
- 36 – Project developers shall be required to maintain the pre-development  
37 flood hydrograph for all storms up to and including the 100-year rainfall  
38 event. All stormwater retention and/or infiltration and treatment systems  
39 shall also be designed for all storms up to and including the 100-year  
40 storm event.
- 41

42 **WR1-3** As part of a Spill Prevention and Emergency Response Plan, measures to  
43 prevent potential groundwater and surface water contamination shall be  
44 identified.



**WR1-4**

Developers shall be required to conduct a detailed hydrologic study that demonstrates their clear understanding of the local surface water and groundwater hydrology. At a minimum, this hydrologic study shall include:

- Determination of the relationship of the project site hydrologic basin to the basins in the region;
- Identification of all surface water bodies within the watershed of SEZs or individual projects (including rivers, streams, ephemeral washes/drainages, lakes, wetlands, playas, and floodplains);
- Identification of all applicable groundwater aquifers;
- 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 identify 100-year 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, surface water/groundwater connectivity), and lag times between groundwater withdrawals and surface water depletions);
- Quantification of the 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 their adequacy with regard to serving project demands while maintaining aquatic, riparian, and other water-dependent resources. The sophistication in hydrologic analyses required to quantify a sustainable yield will correspond to the amount of water use requirements proposed by a project, with greater water use requirements needing more in-depth analyses in quantifying a sustainable yield of the water source.

- 1 **WR1-5** Project developers shall quantify water use requirements for project  
2 construction, operation, and decommissioning.  
3
- 4 **WR1-6** Water sources used for potable water supply shall meet federal, state, and  
5 local water quality standards (e.g., Sections 303 and 304 of the CWA).  
6
- 7 **WR1-7** Developers shall identify wastewater treatment measures and new or  
8 expanded facilities, if any, to be included as part of the facility’s National  
9 Pollutant Discharge Elimination System (NPDES) permit.  
10
- 11 **WR1-8** Developers shall coordinate with state/local regulatory agencies regarding the  
12 issuance of permits or “will-serve” agreements for the development and use  
13 of water and/or the operation of on-site wastewater treatment systems.  
14
- 15 **WR1-9** Project developers shall coordinate with appropriate water rights agencies for  
16 securing water rights.  
17
- 18 **WR1-10** Project developers shall choose appropriate water sources with respect to  
19 available water rights and management practices and with respect to  
20 maintaining aquatic, riparian, and other water-dependent sources (that may  
21 vary in water requirements on a temporal basis).  
22
- 23 **WR1-11** A Water Resources Monitoring and Mitigation Plan shall be developed to  
24 monitor for potential impacts to both groundwater and surface waters during  
25 construction, operations, and decommissioning phases. Groundwater  
26 monitoring includes monitoring the effects of groundwater withdrawal on  
27 groundwater surface elevations, groundwater flow paths, changes to  
28 groundwater-dependent vegetation, and of aquifer recovery after project  
29 decommissioning. Surface water monitoring includes monitoring changes in  
30 flows, water volumes, channel characteristic, and water quality. Monitoring  
31 frequency shall be decided on a site-specific basis and in coordination with  
32 federal, state, and local agencies that manage the water resources of the  
33 region.  
34
- 35 **WR1-12** If groundwater use is proposed, project developers shall ensure that a  
36 comprehensive analysis of the groundwater basin is provided and that the  
37 following potential significant impacts are evaluated:  
38
- 39 – Creation or exacerbation of overdraft conditions and their potential to  
40 cause subsidence and loss of aquifer storage capacity;
  - 41
  - 42 – Uses that cause injury to other water rights claims in the basin;
  - 43
  - 44 – Estimates of the total cone of depression considering cumulative  
45 drawdown from all potential pumping in the basin, including the project,  
46 for the life of the project through the decommissioning phase;

- 1
- 2 – Changes in water quality that affect other beneficial use;
- 3
- 4 – Effects on surface water resources such as streams, springs, seeps, and
- 5 wetlands that provide water and associated habitat for plants and animals
- 6 or are culturally important to Native Americans; and
- 7
- 8 – The sophistication in hydrologic analyses required to demonstrate
- 9 minimal impacts to groundwater resources will correspond to the
- 10 amount of water use requirements proposed by a project, with greater
- 11 water use requirements needing more in-depth analyses in quantifying
- 12 groundwater protection.
- 13

14 **WR1-13** If surface water use is proposed, project developers shall ensure that a  
 15 comprehensive analysis of the supply is provided and that the following  
 16 potential significant impacts are evaluated:

- 17
- 18 – Effects on other users;
- 19
- 20 – Effects on water quality;
- 21
- 22 – Effects on other water resources;
- 23
- 24 – Effects on other environmental resources, including plants and animals
- 25 that directly or indirectly depend on those water sources;
- 26
- 27 – Effects on the natural hydrograph of the supply;
- 28
- 29 – Effects on the reliability of the supply; and
- 30

31 The sophistication in hydrologic analyses required to demonstrate minimal  
 32 impacts to surface water resources will correspond to the amount of water  
 33 use requirements proposed by a project, with greater water use requirements  
 34 needing more in-depth analyses in quantifying surface water protection.

35

36 **WR1-14** Early consultation shall be done with the U.S. Army Corps of Engineers  
 37 (USACE) regarding the siting of solar energy generating facilities and its  
 38 transmission in relation to hydrological features that have the potential to be  
 39 subject to USACE jurisdiction. Consultation with the USACE shall include  
 40 submittal of a jurisdictional delineation in accordance with the 1987 wetlands  
 41 delineation manual and appropriate regional supplement; avoidance,  
 42 minimization and compensation proposals, as necessary. A Least  
 43 Environmentally Damaging Practicable Alternative (LEDPA) shall also be  
 44 identified and analyzed within the environmental analysis. A USACE permit,  
 45 Nationwide verification or approved jurisdiction letter shall be provided to

1 the BLM prior to a decision (Note: this is also presented as design feature  
2 ER1-41).  
3  
4

5 **A.2.2.10.2 Site Characterization, Siting, and Design Construction**  
6

7 **WR2-1** In the very early stages of the development of siting and design plans, project  
8 developers shall coordinate with appropriate federal, state, and local agencies that  
9 regulate activities that affect land and water resources to determine what permits or  
10 approvals may be needed for construction and operation of a solar facility and shall  
11 be applied when appropriate.  
12

13 **WR2-2** Project developers shall plan to implement water conservation measures  
14 related to solar energy technology water needs in order to reduce project  
15 water requirements. Developers shall minimize the consumptive use of fresh  
16 water for power plant cooling by, for example, using dry cooling, using  
17 recycled or impaired water, or selecting solar energy technologies that do not  
18 require cooling water.  
19

20 **WR2-3** Project developers shall plan to avoid impacts on existing surface water  
21 features, including streams, lakes, wetlands, floodplains, intermittent streams,  
22 playas, and ephemeral washes/drainages (any unavoidable impacts would be  
23 minimized or mitigated) of the development and in nearby regions according  
24 to:  
25

- 26 – All sections of the Clean Water Act (CWA), including Sections 401,  
27 402, and 404 addressing licensing and permitting issues;  
28
- 29 – Executive Orders (E.O.s) 11988 and 11990 of May 24, 1977, regarding  
30 floodplain and wetland management: E.O. 11988, “Floodplain  
31 Management” (*Federal Register*, Volume 42, page 26951  
32 [42 FR 26951]), and E.O. 11990, “Protection of Wetlands”  
33 (42 FR 26961);  
34
- 35 – U.S. Environmental Protection Agency (EPA) stormwater management  
36 guidelines and applicable state and local guidelines;  
37
- 38 – National Wild and Scenic Rivers System (Public Law 90-542;  
39 16 *United States Code* [U.S.C.] 1271 et seq.); and  
40
- 41 – Identification of impaired surface water bodies in accordance with  
42 Section 303(d) of the CWA.  
43  
44

- 1 **WR2-4** Project developers shall plan to minimize impacts to groundwater aquifers.  
2  
3 – Impacts on sole source aquifers shall be avoided according to EPA  
4 guidelines.  
5
- 6 **WR2-5** Project developers shall avoid impacts on local surface water and  
7 groundwater drinking water supplies (amounts and water quality) and  
8 develop mitigation plans in the event that local drinking water sources are  
9 contaminated or depleted by project activities.  
10
- 11 **WR2-6** The facility shall obtain and comply with a construction stormwater permit  
12 through the EPA or state-run NPDES program (whichever applies within the  
13 state). In addition, the EPA requires that any development larger than  
14 20 acres (0.08 km<sup>2</sup>) and begun after August 2011 must comply with a  
15 requirement to monitor construction discharges for turbidity concentrations.  
16
- 17 **WR2-7** Groundwater wells constructed during any stage of the project shall conform  
18 to state and local standards and include:  
19  
20 – Legal description (township, range, section, and quarter section);  
21  
22 – Project map with proposed and existing well locations;  
23  
24 – Well design characteristics: casing diameter, screened interval(s), well  
25 depth, and static water level;  
26  
27 – Results of groundwater pumping tests or other tests done in the well;  
28  
29 – Anticipated pumping capacity and peak pumping rates;  
30  
31 – Identification of the groundwater aquifer and its hydrogeologic  
32 characteristics;  
33  
34 – Estimation of the potential cone of depression that might be produced by  
35 the proposed pumping throughout the lifetime of a project by using an  
36 analytical or numerical model; and  
37  
38 – Estimate of the total cone of depression considering cumulative  
39 drawdown from all potential pumping in the basin, including the project,  
40 for the life of the project through the decommissioning phase by using  
41 an analytical or numerical model.  
42
- 43 **WR2-8** Construction activities shall avoid land disturbance in ephemeral washes and  
44 dry lakebeds; any unavoidable disturbance would be minimized. Stormwater  
45 facilities shall be designed to route flow around the facility and maintain pre-

- 1 project hydrographs and to ensure protection of existing properties adjacent  
2 to developments.  
3
- 4 **WR2-9** When stream or wash crossings are constructed, culverts or water  
5 conveyances for temporary and permanent roads shall be designed to comply  
6 with county standards or to accommodate the runoff of a 100-year storm,  
7 whichever is larger.  
8
- 9 **WR2-10** Geotextile mats shall be used to stabilize disturbed channels and  
10 streambanks.  
11
- 12 **WR2-11** Earth dikes, swales, and lined ditches shall be used to divert work-site runoff  
13 that would otherwise enter a disturbed stream.  
14
- 15 **WR2-12** Certified weed-free straw bale barriers shall be installed to control sediment  
16 in runoff water; straw bale barriers shall be installed only where sediment-  
17 laden water can pond, thus allowing the sediment to settle out.  
18
- 19 **WR2-13** Check dams (i.e., small barriers constructed of rock, gravel bags, sandbags,  
20 fiber rolls, or reusable products) shall be placed across a constructed swale or  
21 drainage ditch to reduce the velocity of flowing water, thus allowing  
22 sediment to settle and reducing erosion.  
23
- 24 **WR2-14** Special construction techniques shall be used, where applicable, in areas of  
25 erodible soil, alluvial fans, and stream channel/wash crossings.  
26
- 27 **WR2-15** Disturbed soils shall be reclaimed as quickly as possible, or protective covers  
28 shall be applied.  
29
- 30 **WR2-16** Topsoil removed during construction shall be reused for reclamation.  
31
- 32 **WR2-17** Foundations and trenches shall be backfilled with originally excavated  
33 material as much as possible; excess excavated material shall be disposed of  
34 according to state and federal laws.  
35
- 36 **WR2-18** If drilling activities are required as part of site characterization, any drilling  
37 fluids or cuttings shall be maintained so that cuttings, fluids, or runoff from  
38 storage areas will not come in contact with aquatic habitats. Temporary  
39 impoundments for storing drilling fluids and cuttings shall be lined to  
40 minimize the infiltration of runoff into groundwater or surface water.  
41
- 42 **WR2-19** Washing equipment or vehicles in streams and wetlands shall be avoided  
43 because doing so increases their sediment loads and potential for  
44 contamination or invasive species transfer.  
45

- 1 **WR2-20** Entry and exit pits shall be constructed in work areas to trap sediments from  
2 vehicles so that they do not enter into streams at stream crossings.  
3 Prerequisites to excavating the entry and exit pits shall include:  
4  
5 – Locating the entry and exit pits far enough from stream banks and at a  
6 sufficient elevation to avoid inundation by storm flow stream levels and  
7 to minimize excessive migration of groundwater into the entry or exit  
8 pits;  
9  
10 – Isolating the excavation for the entry and exit pits from the surface water  
11 by using silt fencing to avoid sediment transport by stormwater; and  
12  
13 – Isolating the spoils storage resulting from excavation of the entry and  
14 exit pits by using silt fencing to avoid sediment transport by stormwater.  
15
- 16 **WR2-21** Waste management practices shall be adopted for handling, storing, and  
17 disposing of wastes generated by a construction project to prevent the release  
18 of waste materials into stormwater discharges. Waste management includes  
19 the following: spill prevention and control, construction debris and litter  
20 management, concrete waste management, and liquid waste management.  
21
- 22 **WR2-22** Any wastewater generated in association with temporary, portable sanitary  
23 facilities shall be periodically removed by a licensed hauler and introduced  
24 into an existing municipal sewage treatment facility. Portable sanitary  
25 facilities provided for construction crews shall be adequate to support  
26 expected on-site personnel.  
27
- 28 **WR2-23** The creation of hydrologic conduits shall be avoided between two aquifers  
29 during foundation excavation and other activities.  
30
- 31 **WR2-24** If chemical dust palliatives (suppressants) are used, they shall be selected and  
32 applied in accordance with the facilities Dust Abatement Plan.  
33
- 34 **WR2-25** When an herbicide/pesticide is used to control vegetation, the climate, soil  
35 type, slope, and vegetation type shall be considered in determining the risk of  
36 herbicide/pesticide contamination. In addition, a Nuisance Animal and Pest  
37 Control Plan and an Integrated Vegetation Management Plan shall be  
38 developed to ensure that applications will be conducted within the framework  
39 of BLM and DOI policies and standard operating procedures and will entail  
40 the use of only EPA-registered pesticides/herbicides that also comply with  
41 state and local regulations.  
42
- 43 **WR2-26** All hazardous materials and vehicle/equipment fuels shall be transported,  
44 stored, managed, and disposed of in accordance with accepted best  
45 management practices (BMPs) and in compliance with all applicable  
46 regulations and the requirements of approved plans, including, where

1 applicable, a Stormwater Management Plan, Spill Prevention and Emergency  
2 Response Plan, and Hazardous Materials and Waste Management Plan.

- 3  
4 **WR2-27** Project developers shall avoid or minimize and mitigate the degradation of  
5 water quality (e.g., chemical contamination, increased salinity, increased  
6 temperature, decreased dissolved oxygen, and increased sediment loads) that  
7 could result from construction activities. Water quality in areas adjacent to or  
8 downstream from development areas shall be monitored during the life of the  
9 project to ensure that water quality is protected.

10  
11  
12 ***A.2.2.10.3 Operations and Maintenance***

- 13  
14 **WR3-1** Groundwater and surface water monitoring activities shall be implemented as  
15 outlined in the established Water Resources Monitoring and Mitigation Plan  
16 for the site. Adaptive management plans will ensure that long-term water use  
17 during operations shall not contribute to the significant long-term decline of  
18 groundwater levels or surface water flows and volumes. Any project-related  
19 water use shall not contribute to withdrawals that exceed the sustainable yield  
20 of the surface water or groundwater source.

- 21  
22 **WR3-2** The treatment of sanitary and industrial wastewater either on-site or off-site  
23 shall comply with federal, state, and local regulations. Any discharges to  
24 surface waters would require NPDES permitting. Any storage or treatment of  
25 wastewater on-site shall have to ensure proper lining of holding ponds and  
26 tanks to prevent leaks.

- 27  
28 **WR3-3** Berms and other controls shall be used at facilities to prevent off-site  
29 migration of any leaked or spilled heat transfer fluid (HTF), thermal energy  
30 storage (TES) fluids, or any other chemicals stored or used at the site.

- 31  
32 **WR3-4** Project developers shall avoid or minimize and mitigate the degradation of  
33 water quality (e.g., chemical contamination, increased salinity, increased  
34 temperature, decreased dissolved oxygen, and increased sediment loads) that  
35 could result from operations. Water quality in areas adjacent to or  
36 downstream from development areas shall be monitored during the life of the  
37 project to ensure that water quality is protected.

38  
39  
40 ***A.2.2.10.4 Reclamation and Decommissioning***

- 41  
42 **WR4-1** All management plans, design features, and stipulations developed for the  
43 construction phase shall be applied to similar activities during the  
44 decommissioning/reclamation phase.



1 **WR4-2** Topsoil removed during construction shall be reused during reclamation  
2 activities immediately following construction.

3  
4 **WR4-3** Groundwater and surface water monitoring activities shall continue as  
5 outlined in the established Water Resources Monitoring and Mitigation Plan  
6 for the site.  
7  
8

9 **A.2.2.11 Design Features for Ecological Resources**

10  
11 Many design features are similar for the different types of ecological resources (plant  
12 communities and habitats, wildlife, aquatic resources, and special status species<sup>2</sup>). Design  
13 features for eliminating or reducing impacts on all these types of ecological resources in general  
14 and during the various project phases are presented in the following sections Design features to  
15 minimize impacts from transmission facility construction and operation are included.  
16  
17

18 **A.2.2.11.1 General**

19  
20 **ER1-1** Project developers shall designate a qualified biologist who will be  
21 responsible for overseeing compliance with all design features related to the  
22 protection of ecological resources throughout all project phases, particularly  
23 in areas requiring avoidance or containing sensitive biological resources,  
24 such as special status species and important habitats. Additional qualified  
25 biological monitors may be required on site during all project phases as  
26 determined by the BLM, USFWS, and appropriate state agencies.  
27

28 **ER1-2** Workers must be aware that only qualified biologists are permitted to handle  
29 listed species according to specialized protocols approved by the USFWS. A  
30 biologist shall be reviewed and approved by the USFWS and the BLM for  
31 designation as a qualified biologist on a project by project basis.  
32

33 **ER1-3** All personnel shall be instructed on the identification and protection of  
34 ecological resources (especially for special status species), including  
35 knowledge of required design features. The required ecological knowledge  
36 shall be incorporated into a Worker Education and Awareness Plan (WEAP)  
37 that is provided to all project personnel prior to entering the project work site.  
38 The WEAP shall be provided on a regular basis, so as to ensure the continued

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<sup>2</sup> Special status species include the following types of species: (1) species listed as threatened or endangered under the ESA; (2) species that are proposed for listing, under review, or candidates for listing under the ESA; (3) species that are listed as threatened or endangered by the state or are identified as fully protected by the state; (4) species that are listed by the BLM as sensitive; and (5) species that have been ranked S1 or S2 by the state or as species of concern by the state or USFWS. Note that some of the categories of species included here do not fit BLM's definition of special status species as defined in BLM Manual 6840 (BLM 2008). These species are included here to ensure broad consideration of species that may be most vulnerable to impacts.

1 ecological awareness of the project work site during all phases of the projects  
2 life. The base information the WEAP provides shall be reviewed and  
3 approved by BLM prior to the issuance of a Notice to Proceed and  
4 incorporate adaptive management protocols for addressing ecological  
5 changes over the life of the project, should they occur.  
6

7 **ER1-4** Workers shall not unnecessarily disturb or feed wildlife. The collection,  
8 harassment, or disturbance of plants, wildlife, and their habitats (particularly  
9 special status species) shall be reduced through employee and contractor  
10 education about applicable state and federal laws. In addition, the following  
11 measures shall be implemented: (1) all personnel shall be instructed to avoid  
12 harassment and disturbance of local plants and wildlife; (2) personnel shall  
13 be made aware of the potential for wildlife interactions around facility  
14 structures; (3) food refuse and other garbage shall be placed in closed  
15 containers so it is not available to scavengers; and (4) workers shall be  
16 prohibited from bringing firearms and pets to project sites.  
17

18 **ER1-5** Section 5.10.1.1.2 discusses the potential impacts on vegetation from site  
19 clearing and grading. Projects shall maintain native vegetation cover and  
20 soils to the extent possible and minimize grading to reduce flooding,  
21 maintain natural infiltration rates, maintain wildlife habitat, maintain soil  
22 health, and reduce erosion potential. All short (i.e., less than 7-in. [18-cm]  
23 tall) native vegetation shall be retained to the maximum extent possible.  
24 Blading within the project site shall be minimized to the maximum extent  
25 possible. Where necessary and feasible, shrub cover may be mowed and/or  
26 raked to smooth out the surface. Retention of native root structure and seeds  
27 within the project area would help retain soil stability, minimize soil erosion,  
28 and minimize fugitive dust pollution. Retention of native seed and roots  
29 within the project site will also facilitate recovery of vegetative cover. Use of  
30 native plant species will minimize the need to water the vegetation, because  
31 native species are already adapted to the local climate and moisture regime of  
32 the area.  
33

34 **ER1-6** Plants, wildlife, and their habitats shall be protected from fugitive dust  
35 through measures included in the facility's Dust Abatement Plan.  
36

37 **ER1-7** Section 5.10.2.1.2 discusses the potential impacts of construction on wildlife.  
38 Activities shall be timed to avoid, minimize, or mitigate impacts on wildlife.  
39 For example, crucial winter ranges, migration corridors, and calving areas for  
40 elk, deer, pronghorn, and other species shall be avoided, especially during  
41 their periods of use. If activities are planned during bird breeding seasons, a  
42 nesting bird survey shall be conducted first. If active nests are detected, the  
43 nest area shall be flagged, and no activity shall take place near the nest (at a  
44 distance determined in coordination with the USFWS) until nesting is  
45 completed (i.e., nestlings have fledged or the nest has failed) or until  
46 appropriate agencies agree that construction can proceed with the

1 incorporation of agreed-upon monitoring measures. The timing of activities  
2 shall be coordinated with the BLM, USFWS, and appropriate state agencies.

3  
4 **ER1-8** Noise reduction devices (e.g., mufflers) shall be employed to minimize the  
5 impacts on wildlife and special status species populations. Explosives shall  
6 be used only within specified times and at specified distances from sensitive  
7 wildlife or surface waters as established by the BLM or other federal and  
8 state agencies. Operators shall ensure that all equipment is adequately  
9 muffled and maintained in order to minimize disturbance to wildlife. As  
10 practicable, vehicles and equipment shall not be left idling as this not only  
11 contributes to air pollution but also can be a source of noise impacts on  
12 wildlife. Section 5.10.2.1.2 includes a discussion of potential noise impacts  
13 during construction on wildlife.

14  
15 **ER1-9** Design features for hazardous materials and waste management regarding  
16 refueling, equipment maintenance, and spill prevention and response shall be  
17 applied to reduce the potential for impacts on ecological resources.

18  
19 **ER1-10** Low-water crossings (fords) shall be used only as a last resort, and then  
20 during the driest time of the year. Rocked approaches to fords shall be used.  
21 The pre-existing stream channel, including bed and banks, shall be restored  
22 after the need for a low-water ford has passed.

23  
24 **ER1-11** The number of areas where wildlife could hide or be trapped (e.g., open  
25 sheds, pits, uncovered basins, and laydown areas) shall be minimized. For  
26 example, an uncovered pipe that has been placed in a trench should be  
27 capped at the end of each workday to prevent animals from entering the pipe.  
28 If a special status species is discovered inside a component, that component  
29 must not be moved, or, if necessary, moved only to remove the animal from  
30 the path of activity, until the animal has escaped.

31  
32 **ER1-12** During all project phases, buffer zones shall be established around sensitive  
33 habitats, and project facilities and activities shall be excluded or modified  
34 within those areas, to the extent practicable. Sections 5.10.1.1.1 and  
35 5.10.1.1.2 discuss potential impacts to sensitive habitats.

36  
37 **ER1-13** In order to reduce the potential for impacts to special status species  
38 (described in Section 5.10.4), project activities shall not be located in or near  
39 habitats occupied by special status animal species. Buffer zones shall be  
40 established around these areas (e.g., identified in the land use plan or  
41 substantiated by best available information or science) to prevent any  
42 destructive impacts associated with project activities.

43  
44 **ER1-14** If any federally listed threatened and endangered species are found during  
45 any phase of the project, the USFWS shall be consulted as required by  
46 Section 7 of the ESA, and an appropriate course of action shall be determined

1 to avoid or mitigate impacts. All applicable terms and conditions and  
2 conservation measures listed in the programmatic Biological Opinion, issued  
3 by the USFWS, shall be followed.  
4

5 **ER1-15** Access roads shall be appropriately constructed, improved, maintained, and  
6 provided with signs to minimize potential wildlife/vehicle collisions and  
7 facilitate wildlife movement through the project area. Sections 5.10.2.1.2 and  
8 5.10.2.1.3 discuss the potential impacts of construction and operation  
9 (including wildlife/vehicle collisions) on wildlife, respectively.  
10

11 **ER1-16** Project vehicle speeds shall be limited in areas occupied by special status  
12 animal species in order to reduce the potential for collision. Traffic shall stop  
13 to allow wildlife to cross roads. Shuttle vans or carpooling shall be used  
14 where feasible to reduce the amount of traffic on access roads.  
15

16 **ER1-17** Unless authorized, personnel shall not attempt to move live, injured, or dead  
17 wildlife off roads, ROWs, or the project site. Honking horns, revving  
18 engines, yelling, and excessive speed are inappropriate and considered a form  
19 of harassment. If traffic is being unreasonably delayed by wildlife in roads,  
20 personnel shall contact the project biologist and security, who will take  
21 necessary action.  
22

23 **ER1-18** Road closures or other travel modifications (e.g., lower speed limits, no foot  
24 travel) shall be considered during crucial periods (e.g., extreme winter  
25 conditions, calving/fawning seasons, raptor nesting). Personnel shall be  
26 advised to minimize stopping and exiting their vehicles in the winter ranges  
27 of large game while there is snow on the ground. Sections 5.10.2.1.2 and  
28 5.10.2.1.3 discuss the potential impacts of construction and operation  
29 (including disturbance) on wildlife, respectively.  
30

31 **ER1-19** Any vehicle-wildlife collisions shall be immediately reported to security.  
32 Observations of potential wildlife problems, including wildlife mortality,  
33 shall be immediately reported to the BLM or other appropriate agency  
34 authorized officer. Procedures for removal of wildlife carcasses on-site and  
35 along access roads shall be addressed in the Nuisance Animal and Pest  
36 Control Plan, to avoid vehicle-related mortality of carrion-eaters.  
37

38 **ER1-20** A Nuisance Animal and Pest Control Plan shall be developed that identifies  
39 management practices to minimize increases in nuisance animals and pests in  
40 the project area, particularly those individuals and species that would affect  
41 human health and safety or have the potential to adversely affect native  
42 plants and animals. The plan would identify nuisance and pest species that  
43 are likely to occur in the area, risks associated with these species, species-  
44 specific control measures, and monitoring requirements. Sections 5.10.2.1.2,  
45 5.10.2.1.3, and 5.10.2.1.4 discuss the potential impacts of construction,

1 operation, and decommissioning on wildlife, respectively. It would be during  
2 these phases that nuisance animals and pests could be of most concern.  
3

4 **ER1-21** Sections 5.10.1.1.2 and 5.10.1.1.4 discuss the need for local and regional  
5 native plants in revegetation and restoration. An Integrated Vegetation  
6 Management Plan shall be developed that is consistent with applicable  
7 regulations and agency policies for the control of noxious weeds and invasive  
8 plant species. The plan shall address monitoring; ROW vegetation  
9 management; the use of certified weed-free seed and mulching; the cleaning  
10 of vehicles to avoid introducing invasive weeds; and the education of  
11 personnel on weed identification, the manner in which weeds spread, and  
12 methods for treating infestations. For transmission line ROWs, the plan shall  
13 be consistent with the existing vegetation management plan for that ROW.  
14 Principles of integrated pest management, including biological controls, shall  
15 be used to prevent the spread of invasive species, per the *Vegetation*  
16 *Treatments Using Herbicides on BLM Lands in 17 Western States*, and the  
17 *National Invasive Species Management Plan, 2009*. The plan shall cover  
18 periodic monitoring, reporting, and immediate eradication of noxious weed  
19 or invasive species occurring within all managed areas. A controlled  
20 inspection and cleaning area shall be established to visually inspect  
21 construction equipment arriving at the project area and to remove and collect  
22 seeds that may be adhering to tires and other equipment surfaces. To prevent  
23 the spread of invasive species, project developers shall work with the local  
24 BLM field office to determine whether a pre-activity survey is warranted,  
25 and if so, to conduct the survey. If invasive plant species are present, project  
26 developers shall work with the local BLM field office to develop a control  
27 strategy. The plan shall include a post-construction monitoring element that  
28 incorporates adaptive management protocols.  
29

30 **ER1-22** Where revegetation and restoration are used as a tool to mitigate or  
31 rehabilitate project impacts following construction and/or decommissioning,  
32 the proponent shall assist in ongoing BLM efforts to procure and develop  
33 locally and regionally appropriate native plant materials. Where conditions  
34 permit, the project developer could collect and voucher seeds from native  
35 plant species identified on BLM target lists for regional native plant material  
36 development by following the BLM Seeds of Success Protocol as described  
37 in BLM's Handbook H1740-2, *Integrated Vegetation Management*. On the  
38 basis of the expected need for native plant materials, the project developer  
39 could contribute funding to support the BLM Native Plant Materials  
40 Development Program. The suggested funding rate is \$100 in U.S. dollars  
41 per acre for each acre on which restoration or revegetation will be used to  
42 mitigate project impacts and for each acre expected to be rehabilitated  
43 following site decommissioning. Section 5.10.1.1.2 discusses potential  
44 impacts associated with the spread of noxious weeds and invasive plant  
45 species.  
46

1 **ER1-23** To reduce the risk of non-native and nuisance aquatic species introductions,  
2 equipment used in surface water shall be decontaminated as appropriate,  
3 especially equipment used to convey water (i.e., pumps). Section 5.10.3  
4 discusses the need for decontaminating equipment to avoid the transfer of  
5 nuisance aquatic species.  
6

7 **ER1-24** Herbicide use shall be limited to nonpersistent, immobile substances. Only  
8 herbicides with low toxicity to wildlife and nontarget native plant species  
9 shall be used, as determined in consultation with the USFWS.  
10 Section 5.10.2.1.5 discusses the potential impacts of herbicides on wildlife.  
11 The typical herbicide application rate rather than the maximum application  
12 rate shall be used where this rate is effective. All herbicides shall be applied  
13 in a manner consistent with their label requirements and in accordance with  
14 guidance provided in the Final Solar PEIS on vegetation treatments using  
15 herbicides. No herbicides shall be used near or in surface water, streams  
16 (including ephemeral, intermittent, or perennial), riparian areas, or wetlands.  
17 Section 5.10.1.1.5 discusses potential impacts to plant communities,  
18 including wetlands, from the use of herbicides and Section 5.10.3 discusses  
19 the potential for contaminant impacts to aquatic biota. Setback distances shall  
20 be determined through coordination with federal and state resource  
21 management agencies. Before herbicide treatments are begun, a qualified  
22 biologist shall conduct surveys of bird nests and of special status species to  
23 identify the special measures or BMPs necessary to avoid and minimize  
24 impacts on migratory birds and special status species.  
25

26 **ER1-25** An Ecological Resources Mitigation and Monitoring Plan shall be developed  
27 to avoid, minimize, or mitigate adverse impacts on important ecological  
28 resources. The plan shall include, but not necessarily be limited to, the  
29 following elements, where applicable:  
30

- 31 – Revegetation, soil stabilization, and erosion reduction measures that  
32 shall be implemented to ensure that all temporary use areas are restored.  
33 The plan shall require that restoration occurs as soon as possible after  
34 activities are completed in order to reduce the amount of habitat  
35 converted at any one time and to speed up the recovery to natural  
36 habitats.
- 37
- 38 – Mitigation and monitoring of unavoidable impacts on waters of the  
39 United States, including wetlands.
- 40
- 41 – Compensatory mitigation and monitoring to address any significant  
42 direct, indirect, and cumulative impacts on, and loss of habitat for,  
43 special status plant and animal species.  
44

- 1           – Compliance with the regulatory requirements of the BGEPA for bald  
2           and golden eagles. Compliance strategies shall be developed in  
3           coordination with the USFWS.
- 4
- 5           – Measures to protect birds (including migratory species protected under  
6           the MBTA) developed in coordination with the appropriate federal and  
7           state agencies (e.g., BLM, USFWS, and state resource management  
8           agencies).
- 9
- 10          – Measures to protect raptors developed in coordination with the  
11          appropriate federal and state agencies (e.g., BLM, USFWS, and state  
12          resource management agencies).
- 13
- 14          – Measures to protect bats developed in coordination with the appropriate  
15          federal and state agencies (e.g., BLM, USFWS, and state resource  
16          management agencies).
- 17
- 18          – Measures to mitigate and monitor impacts on special status species  
19          developed in coordination with the appropriate federal and state agencies  
20          (e.g., BLM, USFWS, and state resource management agencies).
- 21
- 22          – Monitoring the potential for increase in predation of special status  
23          species (e.g., desert tortoise, Utah prairie dog, and greater sage-grouse)  
24          from ravens and other species that are attracted to developed areas and  
25          use tall structures opportunistically to spot vulnerable prey. Raven and  
26          other predator monitoring also shall be addressed in the Nuisance  
27          Animal and Pest Control Plan.
- 28
- 29          – Clearing and translocation of special status species, including the steps  
30          to implement the translocation, as well as the follow-up monitoring of  
31          populations in the receptor locations, as determined in coordination with  
32          the appropriate federal and state agencies. The need for a Special Status  
33          Species Clearance and Translocation Plan shall be determined on a  
34          project-specific basis.
- 35

36 **ER1-26** At the project level, recommendations contained in Interim Golden Eagle  
37 Technical Guidance: Inventory and Monitoring Protocol and Other  
38 Recommendations in Support of Golden Eagle Management and Permit  
39 Issuance shall be considered in project planning, as appropriate. In addition,  
40 Instruction Memorandum [IM] 2010-156, the Bald and Golden Eagle  
41 Protection Act–Golden Eagle National Environmental Policy Act and Avian  
42 Protection Plan Guidance for Renewable Energy, shall be adhered to until  
43 programmatic permits from the USFWS are available. The analysis of  
44 potential impacts on, and mitigation for, golden eagles shall be made in  
45 coordination with the USFWS, and the initiation of interagency coordination  
46 on golden eagle issues shall occur early in the planning process.

- 1 **ER1-27** Take<sup>3</sup> of golden eagles and other raptors shall be avoided. Mitigation  
2 regarding the golden eagle shall be developed in consultation with the  
3 USFWS and appropriate state natural resource agencies. A permit may be  
4 required under the Bald and Golden Eagle Protection Act.  
5
- 6 **ER1-28** A Water Resources Monitoring and Mitigation Plan shall be developed for  
7 each project. Changes in surface water or groundwater quality (e.g., chemical  
8 contamination, increased salinity, increased temperature, decreased dissolved  
9 oxygen, and increased sediment loads) or flow that result in the alteration of  
10 terrestrial plant communities or communities in wetlands, springs, seeps,  
11 intermittent streams, perennial streams, and riparian areas (including the  
12 alteration of cover and community structure, species composition, and  
13 diversity) off the project site shall be avoided to the extent practicable. The  
14 monitoring plan shall determine the effects of groundwater withdrawals on  
15 plant communities.  
16
- 17 **ER1-29** Pre-construction ecological monitoring shall be conducted based on BLM,  
18 USFWS, and state agency statutes, programs, and policies. Ecological  
19 monitoring programs shall also be conducted at intervals determined by these  
20 agencies and during construction, operations, and decommissioning.  
21
- 22 **ER1-30** The monitoring program requirements, including adaptive strategies, shall be  
23 established at the project level to ensure that potential adverse impacts are  
24 mitigated. Monitoring programs shall consider the monitoring requirements  
25 for each ecological resource present at the project site, establish metrics  
26 against which monitoring observations can be measured, identify potential  
27 mitigation measures, and establish protocols for incorporating monitoring  
28 observations and additional mitigation measures into standard operating  
29 procedures.  
30
- 31 **ER1-31** A Spill Prevention and Emergency Response Plan shall be developed that  
32 considers sensitive ecological resources. Spills of any toxic substances shall  
33 be promptly addressed and cleaned up before they can enter aquatic or other  
34 sensitive habitats as a result of runoff or leaching. See Section 5.10.1.1.1-4  
35 and 5.10.1.2 for discussions of impacts of spills on plant communities and  
36 5.10.3.1.2 for a discussion of contaminant impacts on aquatic biota.  
37 Section 5.9.3 also discusses the need for a Spill Prevention and Emergency  
38 Response Plan.  
39

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<sup>3</sup> Under the Bald and Golden Eagle Protection Act, “take” means to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, or disturb. “Disturb” means to agitate or bother a bald eagle or a golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle; (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.



- 1 **ER1-32** Section 5.10.1.1.2-3 discusses the potential impacts of fire on native plant  
2 communities. A Fire Management and Protection Plan shall be developed to  
3 implement measures that minimize the potential for a human-caused fire to  
4 affect ecological resources and that responds to natural fire situations.  
5
- 6 **ER1-33** A Trash Abatement Plan shall be developed that focuses on containing trash  
7 and food in closed and secured containers and removing them periodically to  
8 reduce their attractiveness to opportunistic species, such as common ravens,  
9 coyotes, feral cats and dogs, that could serve as predators on native wildlife  
10 and special status animals.  
11
- 12 **ER1-34** Prior to any ground-disturbing activity, seasonally appropriate walkthroughs  
13 shall be conducted by a qualified biologist or team of biologists to ensure that  
14 important or sensitive species or habitats are not present in or near project  
15 areas. Attendees at the walkthrough shall include appropriate federal agency  
16 representatives, state natural resource agencies, and construction contractors,  
17 as appropriate. Habitats or locations to be avoided (with appropriately sized  
18 buffers) shall be clearly marked.  
19
- 20 **ER1-35** If it is determined through coordination with the appropriate federal and state  
21 agencies (e.g., BLM, USFWS, and state resource management agencies) that  
22 it is necessary to translocate plant and wildlife species from project areas,  
23 developers shall ensure that qualified biologists conduct pre- and post-  
24 translocation surveys for target species (especially if the target species are  
25 special status species) and release individuals to protected off-site locations  
26 as approved by the federal and state agencies. The biologists shall coordinate  
27 with appropriate agencies in the safe handling and transport of any special  
28 status species encountered.  
29
- 30 **ER1-36** In accordance with adaptive management strategies, new BLM Instruction  
31 Memorandums (IMs) addressing wildlife and plants issues shall be  
32 incorporated as appropriate.  
33
- 34 **ER1-37** The establishment and spread of invasive species and noxious weeds within  
35 the ROW and in associated areas where there is ground surface disturbance  
36 or vegetation cutting shall be prevented. The area shall be monitored  
37 regularly, and invasive species shall be eradicated immediately.  
38 Section 5.10.1.1.2 discusses potential impacts associated with the spread of  
39 noxious weeds and invasive plant species.  
40
- 41 **ER1-38** Restrictions on timing and duration may be required to minimize impacts on  
42 nesting birds (especially neotropical migrants and listed species) and shall be  
43 developed in coordination with the USFWS. Sections 5.10.2.1.2 discusses the  
44 potential impacts of construction on wildlife.  
45

- 1 **ER1-39** To the extent practicable, work personnel shall stay within the ROW and/or  
2 easements.  
3
- 4 **ER1-40** Removal of raptor nests shall take place only if the birds are not actively  
5 using the nest, particularly during the nesting and brood-rearing period. Nests  
6 shall be relocated to nesting platforms, when possible; otherwise, they must  
7 be destroyed when removed. An annual report on all nests moved or  
8 destroyed will be provided to the appropriate federal and/or state agencies.  
9 Coordination with the USFWS and BLM project wildlife biologist will occur  
10 in the event that a raptor nest is located on a transmission line support  
11 structure. Sections 5.10.2.1.2 and 5.10.2.1.5 discuss the potential impacts of  
12 construction and transmission lines on wildlife (including raptors),  
13 respectively. Removal or relocation of a golden eagle or bald eagle nest (even  
14 an inactive nest) requires a permit from the USFWS.  
15
- 16 **ER1-41** Raven nests shall be removed from transmission towers to reduce predation  
17 pressure on sensitive species, such as the desert tortoise, greater sage-grouse,  
18 and Utah prairie dog. Raven nests can be removed only when inactive  
19 (i.e., no eggs or young); if removal is otherwise necessary, an MBTA take  
20 permit from the USFWS is required. The removal of raven nests shall be  
21 addressed in the Nuisance Animal and Pest Control Plan and shall  
22 incorporate the most current USFWS guidance (e.g. FONSI, *Implementation*  
23 *of a Desert Tortoise Recovery Plan Task: Reduce Common Raven Predation*  
24 *on the Desert Tortoise* [USFWS 2008]).  
25
- 26 **ER1-42** Section 5.10.1.1.2 discusses potential impacts to wetlands and other plant  
27 communities associated with hydrological features under USACE jurisdiction. Early  
28 consultation shall be done with the U.S. Army Corps of Engineers (USACE)  
29 regarding the siting of solar energy generating facilities and its transmission in  
30 relation to hydrological features that have the potential to be subject to USACE  
31 jurisdiction. Consultation with the USACE shall include submittal of a jurisdictional  
32 delineation in accordance with the 1987 wetlands delineation manual and appropriate  
33 regional supplement; avoidance, minimization and compensation proposals, as  
34 necessary. A Least Environmentally Damaging Practicable Alternative (LEDPA)  
35 shall also be identified and analyzed within the environmental analysis. A USACE  
36 permit, Nationwide verification or approved jurisdiction letter shall be provided to the  
37 BLM prior to a decision (Note: this is also presented as design feature WR1-15).  
38
- 39 **ER1-43** Any mortality of bird species (e.g., raptors) that is associated with power  
40 lines shall be monitored and reported to the BLM and the USFWS, and  
41 measures shall be taken to prevent future mortality. Sections 5.10.2.1.5  
42 discuss the potential impacts of transmission lines on wildlife, particularly  
43 birds.  
44  
45

1 **A.2.2.11.2 Site Characterization, Siting, and Design Construction**

2  
3 **ER2-1** To the extent practicable, projects shall be sited on previously disturbed lands  
4 in close proximity to energy load centers to avoid and minimize impacts on  
5 remote, undisturbed lands.

6  
7 **ER2-2** Existing access roads, utility corridors, and other infrastructure shall be used  
8 to the maximum extent feasible.

9  
10 **ER2-3** As practical, staging and parking areas shall be located within the site of the  
11 utility-scale solar energy facility to minimize habitat disturbance in areas  
12 adjacent to the site.

13  
14 **ER2-4** Appropriate agencies (e.g., BLM, USFWS, and state resource management  
15 agencies) shall be contacted early in the project planning process to identify  
16 potentially sensitive ecological resources, including, but not limited to,  
17 aquatic habitats, wetland habitats, unique biological communities, crucial  
18 wildlife habitats, and special status species locations and habitats, including  
19 designated critical habitat, that might be present in the area proposed for a  
20 solar energy facility and associated access roads and ROWs. This  
21 coordination shall be used to identify the need for and scope of pre-  
22 disturbance surveys of the project area and vicinity.

23  
24 **ER2-5** All pre-disturbance surveys shall be conducted by qualified biologists  
25 following accepted protocols established by the USACE, BLM, USFWS, or  
26 other federal or state regulatory agencies, as determined appropriate by the  
27 BLM, to identify and delineate the boundaries of important, sensitive, or  
28 unique habitats in the project vicinity, including but not limited to, waters of  
29 the United States, wetlands, springs, seeps, ephemeral streams, intermittent  
30 streams, 100-year floodplains, ponds and other aquatic habitats, riparian  
31 habitat, remnant vegetation associations, rare or unique natural communities,  
32 and habitats supporting special status species populations.

33  
34 **ER2-6** To the extent practicable, projects shall be sited and designed to avoid direct  
35 and indirect impacts on important, sensitive, or unique habitats in the project  
36 vicinity, including, but not limited to, waters of the United States, wetlands  
37 (both jurisdictional and non-jurisdictional), springs, seeps, streams  
38 (ephemeral, intermittent, and perennial), 100-year floodplains, ponds and  
39 other aquatic habitats, riparian habitat, remnant vegetation associations, rare  
40 or unique biological communities, crucial wildlife habitats, and habitats  
41 supporting special status species populations (including designated and  
42 proposed critical habitat). For cases in which impacts cannot be avoided, they  
43 shall be minimized and mitigated appropriately. Project planning shall be  
44 coordinated with the appropriate federal and state resource management  
45 agencies.

46

- 1 **ER2-7** Solar energy development activities have the potential to affect special status  
2 species in multiple ways as described in Section 5.10.4. Therefore, projects  
3 shall not be sited in designated critical habitat, ACECs, or other specially  
4 designated areas that are considered necessary for special status species and  
5 habitat conservation.  
6
- 7 **ER2-8** Projects shall be designed to avoid, minimize, and mitigate impacts on  
8 wetlands, waters of the United States, and other special aquatic sites.  
9 Sections 5.10.1.1.1-5 and 5.10.1.2 discuss potential impacts to wetlands and  
10 other water-related habitats.  
11
- 12 **ER2-9** In order to avoid and minimize impacts associated with solar energy  
13 development (Section 5.10.4), project facilities and activities, including  
14 associated roads and utility corridors, shall not be located in or near occupied  
15 habitats of special status animal species. Buffer zones shall be established  
16 (e.g., identified in the land use plan or substantiated by best available  
17 information or science) around these areas to prevent any destructive impacts  
18 associated with project activities.  
19
- 20 **ER2-10** Buffer zones shall be established around sensitive habitats, and project  
21 facilities and activities shall be excluded or modified within those areas  
22 (e.g., identified in the land use plan or substantiated by best available  
23 information or science). Sections 5.10.1.1.1 and 5.10.1.1.2 discuss potential  
24 impacts to sensitive habitats.  
25
- 26 **ER2-11** Habitat loss, habitat fragmentation, and resulting edge habitat due to project  
27 development shall be minimized to the extent practicable. Habitat  
28 fragmentation could be reduced by consolidating facilities (e.g., access roads  
29 and utilities could share common ROWs, where feasible), reducing the  
30 number of access roads to the minimum amount required, minimizing the  
31 number of stream crossings within a particular stream or watershed, and  
32 locating facilities in areas where habitat disturbance has already occurred.  
33 Individual project facilities shall be located and designed to minimize  
34 disruption of animal movement patterns and connectivity of habitats.  
35 Sections 5.10.2.1.2 discuss the potential impacts of habitat loss and  
36 fragmentation on wildlife.  
37
- 38 **ER2-12** Locating solar power facilities near open water or other areas that are known  
39 to attract a large number of birds shall be avoided. Sections 5.10.2.1.2 and  
40 5.10.2.1.3 discuss the potential impacts of construction and operation on  
41 wildlife, respectively.  
42
- 43 **ER2-13** Tall structures such as meteorological towers and solar power towers shall be  
44 located to avoid known flight paths of birds and bats. The need for this  
45 design features shall be determined in consultation with BLM, USFWS, and  
46 state natural resource agencies. Sections 5.10.2.1.1 discusses potential

1 collisions of birds and/or bats with meteorological towers; Section 5.10.2.1.3  
2 discussions potential collisions with solar facilities (e.g., power towers); and  
3 Section 5.10.2.1.5 discusses potential collisions with transmission lines.  
4

5 **ER2-14** Transmission line conductors shall span important or sensitive habitats, such  
6 as wetlands, dry washes, riparian habitats, playas, sand dunes and sand  
7 transport areas, within limits of standard structure design. See  
8 Section 5.10.1.1.5 for a discussion of potential impacts of transmission lines  
9 on plant communities and habitats and 5.10.3.1.5 for a discussion of the  
10 impacts of transmission lines on aquatic habitat and biota.  
11

12 **ER2-15** Fences shall be built (as practicable) to exclude livestock and wildlife from  
13 all project facilities, including all water sites. Sections 5.10.2.1.2 and  
14 5.10.2.1.3 discuss the potential impacts of construction and operation on  
15 wildlife, respectively.  
16

17 **ER2-16** Project developers shall identify surface water runoff patterns at the project  
18 site and develop mitigation that prevents soil deposition and erosion  
19 throughout and downhill from the site.  
20

21 **ER2-17** Developers shall avoid the placement of facilities or roads in drainages and  
22 make necessary accommodations for the disruption of runoff. See  
23 Section 5.10.3.1.5 for a discussion of the impacts of roads on aquatic habitat  
24 and biota.  
25

26 **ER2-18** Any necessary stream crossings shall be designed to provide in-stream  
27 conditions that allow for and maintain uninterrupted movement and safe  
28 passage of fish during all project periods. It is also recommended, if stream  
29 crossings are required, that care be taken to minimize removal of deadfall or  
30 overhanging vegetation which provides shelter and shading to aquatic  
31 organisms. See Section 5.10.3.1.2 for a discussion of the impacts of stream  
32 crossings on aquatic habitat and biota.  
33

34 **ER2-19** Projects shall avoid surface water or groundwater withdrawals that affect  
35 sensitive habitats (e.g., aquatic, wetland, playa, microphyll woodland, and  
36 riparian habitats) and any habitats occupied by special status species.  
37 Applicants shall demonstrate, through hydrologic modeling, that the  
38 withdrawals required for their project are not going to affect groundwater  
39 discharges that support special status species or their habitats. Applicants  
40 shall avoid impacts to groundwater discharges that support any groundwater-  
41 dependent habitats (as determined, for example, through hydrologic  
42 modeling), minimize unavoidable impacts, and develop mitigation in  
43 coordination with appropriate agencies. Sections 5.10.1.1.3 and 5.10.1.2  
44 discuss potential impacts on habitats from water use.  
45

- 1 **ER2-20** The capability of local surface water or groundwater supplies to provide  
2 adequate water for the operation of proposed solar facilities shall be  
3 considered early in the project siting and design. As described in  
4 Section 5.10.4.1.3, groundwater withdrawal can alter or eliminate special  
5 status species habitat. Therefore, technologies that would result in  
6 withdrawals that would affect habitats that support special status species shall  
7 not be considered.  
8
- 9 **ER2-21** New roads shall be designed and constructed to meet the appropriate BLM  
10 road design standards, such as those described in *BLM Manual 9113*, and be  
11 no larger than necessary to accommodate their intended functions  
12 (e.g., traffic volume and weight of vehicles). Roads internal to solar facility  
13 sites shall be designed to minimize ground disturbance. Section 5.10.2.1.2  
14 discusses the potential impacts of construction (including access roads) on  
15 wildlife.  
16
- 17 **ER2-22** Pipelines that transport hazardous liquids (e.g., oils) that will pass through  
18 aquatic or other habitats containing sensitive species shall be designed with  
19 block or check valves on both sides of the waterway or habitat to minimize  
20 the amount of product that could be released as a result of leaks. Such  
21 pipelines shall be constructed of double-walled pipe at river crossings.  
22
- 23 **ER2-23** Vehicles and site workers shall avoid entering aquatic habitats, such as  
24 streams and springs, during site characterization activities until surveys by  
25 qualified biologists have evaluated the potential for unique flora and fauna to  
26 be present.  
27
- 28 **ER2-24** Meteorological towers and solar sensors shall be located to avoid sensitive  
29 habitats or areas where wildlife (e.g., sage-grouse) is known to be sensitive to  
30 human activities; applicable land use plans or best available information and  
31 science shall be referred to in order to determine avoidance distances.  
32 Installation of these components shall be scheduled to avoid disrupting  
33 wildlife reproductive activities or migratory or other important behaviors.  
34 Guy wires on meteorological towers shall be avoided. If guy wires are  
35 necessary, permanent markers (bird flight diverters) shall be attached to them  
36 to increase their visibility. Section 5.10.2.1.1 discusses the potential impacts  
37 of meteorological towers on wildlife.  
38
- 39 **ER2-25** Meteorological towers, soil borings, wells, and travel routes shall be located  
40 to avoid important, sensitive, or unique habitats, including, but not limited to,  
41 wetlands, springs, seeps, ephemeral streams, intermittent streams, 100-year  
42 floodplains, ponds and other aquatic habitats, riparian habitat, remnant  
43 vegetation associations, rare natural communities, and habitats supporting  
44 special status species populations as identified in applicable land use plans or  
45 best available information and science.  
46

- 1 **ER2-26** Prior to construction of the facility, environmental training shall be provided  
2 to contractor personnel whose activities or responsibilities could affect the  
3 environment during construction. An environmental compliance officer and  
4 other inspectors, the contractor's construction field supervisor(s), and all  
5 construction personnel are expected to play an important role in maintaining  
6 strict compliance with all permit conditions in order to protect wildlife and  
7 their habitats during construction.  
8
- 9 **ER2-27** Construction activities have the potential to adversely affect special status  
10 species (Section 5.10.4.1.1). Therefore, prior to construction, all areas to be  
11 disturbed shall be surveyed by qualified biologists using approved survey  
12 techniques or established species-specific survey protocols to determine the  
13 presence of special status species in the project area.  
14
- 15 **ER2-28** If possible, on-site construction access routes shall be rolled and compacted  
16 to allow trucks and equipment to access construction locations. Following  
17 construction, disturbed areas shall be lightly raked and/or ripped and  
18 reseeded with seeds from low-stature plant species collected from the  
19 immediate vicinity.  
20
- 21 **ER2-29** To the extent practicable, vegetation clearing, grading, and other construction  
22 activities shall occur outside the bird breeding season. If activities are  
23 planned for the breeding season, a survey of nesting birds shall be conducted  
24 first. If active nests are not detected, construction activities may be  
25 conducted. If active nests are detected, the nest area shall be flagged, and no  
26 activity shall take place near the nest (at a distance coordinated with the  
27 USFWS) until nesting is completed (i.e., nestlings have fledged or the nest  
28 has failed) or until appropriate agencies agree that construction can proceed  
29 with the incorporation of agreed-upon monitoring measures.  
30
- 31 **ER2-30** Explosives shall be used only within specified times and at specified  
32 distances from sensitive wildlife or surface waters, as established by the  
33 BLM or other federal and state agencies. The occurrence of flyrock from  
34 blasting shall be limited by using blasting mats.  
35
- 36 **ER2-31** The extent of habitat disturbance during construction shall be reduced by  
37 keeping vehicles on access roads and minimizing foot and vehicle traffic  
38 through undisturbed areas. Section 5.10.2.1.2 discusses the potential impacts  
39 of construction (including blasting) on wildlife.  
40
- 41 **ER2-32** Temporary or project-created access roads shall be closed to unauthorized  
42 vehicle use, where appropriate.  
43
- 44 **ER2-33** Where a pipeline trench may drain a wetland, trench breakers shall be  
45 constructed, and/or the trench bottom shall be sealed to maintain the original

1 wetland hydrology. Section 5.10.1.1.2 discusses potential impacts to  
2 wetlands from construction of structures such as pipelines.

3  
4 **ER2-34** Because open trenches could impede the seasonal movements of large game  
5 animals and alter their distribution, they shall be backfilled as quickly as is  
6 possible. Open trenches could also entrap smaller animals; therefore, escape  
7 ramps shall be installed along open trench segments at distances identified in  
8 the applicable land use plan or best available information and science.  
9 Section 5.10.2.1.2 discusses the potential impacts of construction on wildlife.

10  
11 **ER2-35** An appropriate number of qualified biological monitors (as determined by  
12 the federal authorizing agency and USFWS) shall be on-site during initial site  
13 preparation and during the construction period to monitor, capture, and  
14 relocate animals that could be harmed and are unable to leave the site on their  
15 own.

16  
17 **ER2-36** Wildlife found in harm's way shall be relocated away from the area of the  
18 activity. Qualified personnel shall be required to relocate some animals such  
19 as rattlesnakes.

20  
21 **ER2-37** Construction debris, especially treated wood, shall not be stored or disposed  
22 of in areas where it could come in contact with aquatic habitats.

23  
24 **ER2-38** As directed by the local BLM field office, Joshua trees (*Yucca brevifolia*),  
25 other *Yucca* species, and most cactus species shall be salvaged prior to land  
26 clearing, and they shall be transplanted, held for use to revegetate temporarily  
27 disturbed areas, or otherwise protected as prescribed by state or local BLM  
28 requirements.

29  
30 **ER2-39** Project-specific Integrated Vegetation Management Plans shall investigate  
31 the possibility of revegetating parts of the solar array area. Where  
32 revegetation is accomplished, fire breaks are required, such that the vegetated  
33 areas would not result in an increased fire hazard. Section 5.10.1.1.2  
34 discusses potential impacts to native species from land clearing.

35  
36 **ER2-40** Reestablishment of vegetation within temporarily disturbed areas shall be  
37 done immediately following the completion of construction activities,  
38 provided such revegetation will not compromise the function of the buried  
39 utilities. Species salvaged during construction could be transplanted into  
40 these areas at a density similar to preconstruction conditions. Revegetation  
41 shall focus on the establishment of native plant communities similar to those  
42 present in the vicinity of the project site. Species used shall consist of native  
43 species dominant within the plant communities that exist in adjacent areas  
44 and have similar soil conditions. Certified weed-free seed mixes of native  
45 shrubs, grasses, and forbs of local origin shall be used. In areas where  
46 suitable native species are unavailable, other plant species approved by the



1 BLM could be used. Section 5.10.1.1.2 discusses the potential effects of  
2 vegetation removal.

3  
4 **ER2-41** The placement of transmission towers within aquatic and wetland habitats, or  
5 other sensitive habitats such as riparian habitats, playas, or dry washes, shall  
6 be avoided whenever feasible. If towers must be placed within these habitats,  
7 they shall not impede flows or fish passage.

8  
9 **ER2-42** If transmission lines are located near aquatic habitats or riparian areas  
10 (e.g., minimum buffers identified in the applicable land use plan or best  
11 available science and information), vegetation maintenance shall be limited  
12 and performed mechanically rather than with herbicides. Cutting in wetlands  
13 or stream and wetland buffers shall be done by hand or by feller-bunchers.  
14 Tree cutting in stream buffers shall only target trees able to grow into a  
15 transmission line conductor clearance zone within 3 to 4 years. Cutting in  
16 such areas for construction or vegetation management shall be minimized,  
17 and the disturbance of soil and remaining vegetation shall be minimized.  
18 Sections 5.10.1.1.2 and 5.10.1.1.5 discusses potential impacts on wetlands  
19 and riparian areas from activities associated with transmission lines.

20  
21 **ER2-43** To the extent practicable, habitat disturbance for transmission line  
22 construction shall be minimized by using helicopters where access roads do  
23 not exist or where access roads could not be constructed without significantly  
24 impacting habitats, and by locating transmission facilities in previously  
25 disturbed areas. The impact of helicopters to noise and air pollution shall be  
26 minimized. Existing utility corridors and other support structures shall be  
27 used to the maximum extent feasible.

28  
29 **ER2-44** Sections 5.10.1.1.1, 5.10.1.1.2, and 5.10.1.1.5 discuss potential impacts on  
30 sensitive habitats from operation of vehicles and construction of structures  
31 including transmission lines. If needed, temporary access roads shall be  
32 developed, primarily by the removal of woody vegetation, although  
33 temporary timber mats should be used in areas of wet soils. Wide-tracked or  
34 balloon-tired equipment, timber corduroy, or timber mat work areas shall be  
35 used on wet soils where wetland or stream crossings are unavoidable and  
36 where crossing on frozen ground is not possible in winter. Areas rutted by  
37 equipment shall be immediately regraded and revegetated. Towers shall be  
38 installed by airlift helicopters, where necessary, to avoid extensive crossing  
39 of wetlands or highly sensitive areas (such as those identified as rare natural  
40 habitats).

41  
42 **ER2-45** ROW development and construction activities shall adhere to locally  
43 established wildlife and/or habitat protection provisions. Exceptions or  
44 modifications to spatial buffers or timing limitations will be evaluated on  
45 a site-specific/species-specific basis in coordination with the local federal

1 administrator and state wildlife agency. Section 5.10.2.1.2 discusses the  
2 potential impacts of construction on wildlife.

3  
4 **ER2-46** Current guidelines and methodologies would be used in the design and  
5 analysis of proposed transmission facilities in order to minimize the potential  
6 for raptors and other birds to be electrocuted by them or to collide with them.  
7 Section 5.10.2.1.5 discusses the potential impacts of transmission lines on  
8 birds.

9  
10 **ER2-47** Transmission line support structures and other facility structures shall be  
11 designed to discourage their use by raptors for perching or nesting (e.g., by  
12 using monopoles rather than lattice support structures or by use of anti-  
13 perching devices). This design would also reduce the potential for increased  
14 predation of special status species, such as the desert tortoise, sage grouse,  
15 and Utah prairie dog. Mechanisms to visually warn birds (permanent markers  
16 or bird flight diverters) shall be placed on transmission lines at regular  
17 intervals to prevent birds from colliding with the lines.

18  
19 **ER2-48** To the extent practicable, the use of guy wires shall be avoided because they  
20 pose a collision hazard for birds and bats. Guy wires shall be clearly marked  
21 with bird flight diverters to reduce the probability of collision.  
22 Section 5.10.2.1.1 discusses the potential impacts of meteorological towers  
23 on birds and bats, while 5.10.2.1.5 discusses the potential impacts of  
24 transmission lines.

25  
26 **ER2-49** Shield wires shall be marked with devices that have been scientifically tested  
27 and found to significantly reduce the potential for bird collisions.  
28 Section 5.10.2.1.5 discusses the potential impacts of transmission lines on  
29 birds.

30  
31  
32 ***A.2.2.11.3 Operations and Maintenance***

33  
34 **ER3-1** Areas left in a natural condition during construction (e.g., wildlife crossings)  
35 shall be maintained in as natural a condition as possible within safety and  
36 operational constraints.

37  
38 **ER3-2** To minimize habitat loss and fragmentation, as much habitat as possible shall  
39 be reestablished after construction is complete by maximizing the area  
40 reclaimed during solar energy operations. Sections 5.10.2.1.2 and 5.10.2.1.3  
41 discuss the potential impacts of habitat fragmentation on wildlife.

42  
43 **ER3-3** Lighting shall be designed to provide the minimum illumination needed to  
44 achieve safety and security objectives. It shall be shielded and orientated to  
45 focus illumination on the desired areas and to minimize or eliminate lighting  
46 of off-site areas or the sky. All unnecessary lighting shall be turned off at

1 night to limit attracting migratory birds or special status species.  
2 Section 5.10.2.1.3 discusses the potential impacts of operation (including  
3 lighting) on wildlife.  
4

5 **ER3-4** For structures that exceed 200 ft (~60 m) in height, applicants shall  
6 coordinate with the USFWS and appropriate state natural resource agencies  
7 to identify obstruction marking, lighting, or other air safety measures that  
8 meet the minimum safety requirements and minimize the potential of bird  
9 strikes. Section 5.10.2.1.3 discusses the potential impacts of operation  
10 (including collisions of birds with power towers) on wildlife.  
11

12 **ER3-5** Evaporation ponds shall be fenced and netted to prevent use by wildlife  
13 where feasible. Open water sources in the desert provide subsidies to ravens  
14 and other predators that feed on special status species (e.g., desert tortoise,  
15 greater sage-grouse, and Utah prairie dog). In addition, these water sources  
16 may have elevated levels of harmful contaminants (e.g., total dissolved solids  
17 and selenium) and could attract wildlife into an industrialized area, where  
18 they are more likely to be killed. The lower 18 in. (46 cm) of the fencing  
19 shall be a solid barrier that would exclude entrance by amphibians and other  
20 small animals. Section 5.10.2.1.3 discusses the potential impacts of operation  
21 (including evaporation ponds) on wildlife.  
22

23 **ER3-6** In order to prevent the effects of the West Nile virus on wildlife, a mosquito  
24 abatement program shall be implemented for all evaporation ponds or other  
25 standing bodies of water that have the potential to support mosquito  
26 reproduction.  
27

28 **ER3-7** Appropriate fish screens shall be installed on cooling water intakes to limit  
29 the potential for impingement impacts on organisms in surface water sources  
30 used for cooling water. Intake designs shall minimize the potential for  
31 aquatic organisms from surface waters to be entrained in cooling water  
32 systems. See Section 5.10.3.1.3 for a discussion of the impacts of water  
33 withdrawals on aquatic habitat and biota.  
34

35 **ER3-8** Pesticide/herbicide use should be conducted in accordance with a Nuisance  
36 Animal and Pest Control Plan and an Integrated Vegetation Management  
37 Plan.  
38  
39

#### 40 ***A.2.2.11.4 Reclamation and Decommissioning***

41

42 **ER4-1** A Decommissioning and Site Reclamation Plan that is specific to the project  
43 shall be developed, approved by the BLM, and implemented and shall  
44 include the following elements:  
45

- 1           – The plan shall contain an adaptive management component that allows  
2           for the incorporation of lessons learned from monitoring data.  
3
- 4           – The plan shall require that land surfaces be returned to pre-development  
5           contours to the greatest extent feasible immediately following  
6           decommissioning.  
7
- 8           – The plan shall be designed to expedite the reestablishment of vegetation  
9           and require restoration to be completed as soon as practicable.  
10
- 11          – To ensure rapid and successful reestablishment efforts, the plan shall  
12          specify site-specific measurable success criteria, including target dates,  
13          which shall be developed in coordination with the BLM and be required  
14          to be met by the operator.  
15
- 16          – Vegetation reestablishment efforts shall continue until all success criteria  
17          have been met.  
18
- 19          – Bonding to cover the full cost of vegetation reestablishment shall be  
20          required (see ROW authorization policies, Section 2.2.2.1).  
21
- 22          – Species used for reestablishing vegetation shall consist of native species  
23          that are dominant within the plant communities in adjacent areas that  
24          have similar soil conditions.  
25
- 26          – The plan shall require the use of weed-free seed mixes of native shrubs,  
27          grasses, and forbs of local sources where available. When available,  
28          seeds of known origin, as labeled by state seed certification programs,  
29          shall be used. Local native genotypes shall be used where practicable. If  
30          cultivars of native species are used, certified seeds (i.e., blue tag) shall  
31          be used. “Source identified” seeds (i.e., yellow tag) shall be used when  
32          native seeds are collected from wildland sites.  
33
- 34          – The cover, species composition, and diversity of the reestablished plant  
35          community shall be similar to those present on-site prior to project  
36          development and in the vicinity of the site. Baseline data shall be  
37          collected in each project area prior to its development as a benchmark  
38          for measuring the success of reclamation efforts. In areas where suitable  
39          native species are unavailable, other plant species approved by the  
40          BLM could be used. If non-native plants are necessary, they shall be  
41          noninvasive, noncompetitive, and, ideally, be short-lived, have low  
42          reproductive capabilities, or be self-pollinating to prevent gene flow into  
43          the native community. The non-native plants that are used shall not  
44          exchange genetic material with common native plant species.  
45

1           – The plan shall be developed in coordination with appropriate federal and  
2           state agencies.  
3

4 **ER4-2**     Access roads shall be reclaimed when they are no longer needed. However,  
5           seasonal restrictions (e.g., nest and brood rearing) shall be considered  
6           (e.g., identified in the land use plan or substantiated by best available  
7           information or science). Section 5.10.2.1.4 discusses the potential impacts of  
8           decommissioning on wildlife.  
9

10 **ER4-3**    All holes and ruts created by the removal of structures and access roads shall  
11           be filled or graded. Section 5.10.2.1.4 discusses the potential impacts of  
12           decommissioning on wildlife.  
13

14 **ER4-4**    While structures are being dismantled, care shall be taken to avoid leaving  
15           debris on the ground in areas where wildlife regularly move.  
16

17 **ER4-5**    Post-decommissioning protocols shall include monitoring for the recovery of  
18           native vegetation, colonization and spread of invasive species, use by  
19           wildlife, and use by special status species. Monitoring data shall be used to  
20           determine the success of reclamation activities and the need for changes in  
21           ongoing management or for additional reclamation measures. Ongoing visual  
22           inspections for a minimum of 5 years following decommissioning activities  
23           shall be required to ensure that there is adequate restoration and minimal  
24           environmental degradation. This period shall be extended until satisfactory  
25           results are obtained.  
26

27 **ER4-6**    The facility fence shall remain in place for several years to help reclamation  
28           (e.g., the fence could preclude large mammals and vehicles from disturbing  
29           revegetation efforts). Shorter times for maintaining fencing may be  
30           appropriate in cases where the likelihood of disturbance by cattle and wildlife  
31           is low. In some cases, it may be appropriate to replace the original exclusion  
32           fence with a new fence that excludes cattle and vehicles but allows for use by  
33           pronghorn and large-game wildlife. This secondary fencing shall remain in  
34           place until the revegetation efforts meet success criteria.  
35  
36

#### 37           **A.2.2.12 Design Features for Air Quality and Climate** 38

39           The following design features were identified to avoid, reduce, and/or mitigate potential  
40           impacts on ambient air quality and climate from solar development that were identified and  
41           discussed in Sections 5.11.1 and 5.11.2 of the Draft and Final Solar PEIS  
42  
43

1                    **A.2.2.12.1 General**

2  
3    **AQC1-1**    A project- and location-specific Dust Abatement Plan shall be prepared for  
4                    all solar facilities. Water spraying, which is widely used as a dust control  
5                    measure, is sometimes not cost effective (in water-deprived locations, for  
6                    example). Paving is also not justifiable for roads that have a low volume of  
7                    traffic within and around a solar facility. Gravel can be used to reduce  
8                    fugitive dust from roads. Another solution for controlling dust is to apply a  
9                    dust suppressant, although this is not a permanent solution.

10  
11   **AQC1-2**    Access roads, on-site roads, and parking lots shall be surfaced with aggregate  
12                    that is hard enough that vehicles cannot crush it and thus cause dust or  
13                    compacted soil conditions. Paving could also be used on access roads and  
14                    parking lots. Alternatively, chemical dust suppressants or durable polymeric  
15                    soil stabilizers shall be used on these locations. The choice of dust  
16                    suppression measures shall consider the potential impacts on wildlife from  
17                    the windborne dispersal of fugitive dust containing dust suppressants and the  
18                    potential impact on future reclamation.

19  
20   **AQC1-3**    All unpaved roads, disturbed areas (e.g., areas of scraping, excavation,  
21                    backfilling, grading, and compacting), and loose materials generated during  
22                    project activities shall be watered as frequently as necessary to minimize  
23                    fugitive dust generation. In water-deprived locations, water spraying shall be  
24                    limited to active disturbance areas only, and non-water-based dust control  
25                    measures shall be implemented in areas with intermittent use or use that is  
26                    not heavy, such as stockpiles or access roads if allowed by the BLM field  
27                    office.

28  
29   **AQC1-4**    Machinery shall use air-emission-control devices as required by federal,  
30                    state, and local regulations or ordinances.

31  
32   **AQC1-5**    On-site vehicle use shall be reduced to the extent feasible.

33  
34   **AQC1-6**    Travel shall be limited to stabilized roads.

35  
36   **AQC1-7**    The main access road to the main power block and the main maintenance  
37                    building area shall be paved.

38  
39   **AQC1-8**    Speed limits (e.g., 10 mph [16 km/hour]) within the construction site shall be  
40                    posted with visible signs and enforced to minimize airborne fugitive dust.

41  
42   **AQC1-9**    All vehicles that transport loose materials as they travel on public roads shall  
43                    be covered, and their loads shall be sufficiently wet and kept below the  
44                    freeboard of the truck.  
45

- 1 **AQC1-10** Workers shall be trained to comply with the speed limit, use standard  
2 engineering practices, minimize the drop height of materials, and minimize  
3 the number and extent of disturbed areas. The project developer shall enforce  
4 these requirements.  
5
- 6 **AQC1-11** Wind fences shall be installed around disturbed areas that could affect the  
7 area beyond the site boundaries (e.g., nearby residences) as appropriate.  
8
- 9 **AQC1-12** All soil disturbance activities and travel on unpaved roads during periods  
10 when dust may become windborne shall be suspended during periods of high  
11 winds. A critical site-specific wind speed shall be determined on the basis of  
12 soil properties determined during site characterization, and monitoring of the  
13 wind speed shall be required at the site during construction, operation, and  
14 reclamation.  
15
- 16 **AQC1-13** Any stockpiles created shall be kept on-site, with an upslope barrier in place  
17 to divert runoff. Stockpiles shall be sprayed with water, covered with  
18 tarpaulins, and/or treated with appropriate dust suppressants, especially in  
19 preparation for high wind or storm conditions. Compatible native vegetative  
20 plantings may also be used to limit dust generation from stockpiles that will  
21 be inactive for a relatively long period. Chemical dust suppressants that emit  
22 volatile organic compounds shall be avoided within or near ozone  
23 nonattainment areas.  
24
- 25 **AQC1-14** All diesel engines used in the facility shall be fueled only with ultra-low  
26 sulfur diesel with a sulfur content of 15 parts per million (ppm) or less.  
27
- 28 **AQC1-15** The idling time of diesel equipment shall be limited to no more than  
29 10 minutes, unless idling must be maintained for proper operation  
30 (e.g., drilling, hoisting, and trenching).  
31
- 32 **AQC1-16** Potential environmental impacts from the use of dust palliatives shall be  
33 minimized by taking all necessary measures to keep the chemicals out of  
34 sensitive soil and streams. In addition, the application of dust palliatives shall  
35 comply with federal, state, and local laws and regulations. Dust palliatives  
36 must meet the requirements of the applicable transmission system operator  
37 (e.g., Western Area Power Administration construction standards prohibit the  
38 use of oil as a dust suppressant).  
39
- 40 **AQC1-17** The transmission lines shall be accessed from public roads and designated  
41 routes to the maximum extent possible in order to minimize fugitive dust  
42 emissions.  
43  
44

1 **A.2.2.12.2 Site Characterization, Siting, and Design Construction**

- 2
- 3 **AQC2-1** All heavy equipment shall meet emission standards specified in the state code  
4 of regulations, and routine preventive maintenance, including tune-ups to  
5 meet the manufacturer's specifications, shall be implemented to ensure  
6 efficient combustion and minimal emissions. Newer and cleaner equipment  
7 that meets more stringent emission controls shall be leased or purchased if  
8 available.  
9
- 10 **AQC2-2** Access to the construction site and staging areas shall be limited to  
11 authorized vehicles only through the designated treated roads.  
12
- 13 **AQC2-3** Construction shall be staged to limit the exposed area at any time, whenever  
14 practical.  
15
- 16 **AQC2-4** Tires of all construction-related vehicles shall be inspected and cleaned as  
17 necessary so they are free of dirt before they enter paved public roadways.  
18
- 19 **AQC2-5** Visible trackout or runoff dirt on public roadways from the construction site  
20 shall be cleaned (e.g., through street vacuum sweeping).  
21
- 22 **AQC2-6** Topsoil from all excavations and construction activities shall be salvaged and  
23 reapplied during reclamation or, where feasible, used for interim reclamation  
24 by being reapplied to construction areas not needed for facility operation as  
25 soon as activities in that area have ceased.  
26
- 27 **AQC2-7** Because of low winds and stable atmospheric conditions occurring in the  
28 early morning from late fall to early spring, the highest 24-hour  
29 concentrations of particulate matter during construction would be attributable  
30 to activities occurring during those hours. Thus, soil disturbance activities  
31 shall be eliminated or minimized under these atmospheric conditions unless  
32 dust can be substantially mitigated, particularly for construction activities  
33 occurring near facility boundaries.  
34
- 35 **AQC2-8** All soil-disturbing activities and travel on unpaved roads during high-wind  
36 events shall be limited.  
37
- 38 **AQC2-9** Ground disturbance from construction-related activities shall avoid areas  
39 with intact biological soil crusts and desert pavement to the extent possible.  
40 For cases in which impacts cannot be avoided, soil crusts will be salvaged  
41 and restored on the basis of recommendations by BLM once construction has  
42 been completed.  
43  
44



1                   **A.2.2.12.3 Operations and Maintenance**

2  
3 **AQC3-1** All combustion sources shall comply with state emission standards (e.g., best  
4 available control technology requirements).

5  
6 **AQC3-2** For portions of facilities that are maintained to be free of vegetation during  
7 operations, the dust control design features that were used to limit fugitive  
8 dust emissions during the construction phase shall be implemented to  
9 minimize fugitive dust emissions from bare surfaces and unpaved access  
10 roads. Section 5.11.1.3 discusses fugitive dust emission impacts.

11  
12  
13                   **A.2.2.12.4 Reclamation and Decommissioning**

14  
15 **AQC4-1** Decommissioning activities are generally the reverse of construction  
16 activities. Impacts from decommissioning are discussed in Section 5.11.1.4.  
17 The design features applied during construction shall also be applied during  
18 decommissioning.

19  
20  
21                   **A.2.2.13 Design Features for Visual Resources**

22  
23                   The following design features were identified to avoid, reduce, and/or mitigate potential  
24 impacts to visual resources from solar development identified and discussed in Section 5.12.3 of  
25 the Draft and Final Solar PEIS.

26  
27  
28                   **A.2.2.13.1 General**

29  
30 **VR1-1** Solar facilities shall be sited and designed properly to eliminate glint and  
31 glare effects on roadway users, nearby residences, commercial areas, or other  
32 highly sensitive viewing locations, or to reduce them to the lowest achievable  
33 levels. Regardless of the solar technology proposed, a Glint and Glare  
34 Assessment, Mitigation, and Monitoring Plan must assess accurately and  
35 quantify potential glint and glare effects and determine the potential health,  
36 safety, and visual impacts associated with glint and glare. The assessment  
37 shall be conducted by qualified individuals using appropriate and commonly  
38 accepted software and procedures. The assessment results must be made  
39 available to the BLM in advance of project approval. If the project design is  
40 changed during the siting and design process such that substantial changes to  
41 glint and glare effects may occur, glint and glare effects shall be recalculated,  
42 and the results shall be made available to BLM.

43  
44 **VR1-2** A Lighting Plan shall be prepared that documents how lighting will be  
45 designed and installed to minimize night-sky impacts and impacts to  
46 nocturnal wildlife during construction and operations. Lighting for hazard

1 marking shall be the minimum necessary to meet the safety requirement.  
2 Lighting for facilities shall not exceed the minimum number, intensity, and  
3 coverage required for safety and basic security. All area lighting shall be  
4 controlled through timer, sensor, or switch that is available to facility  
5 operators; dusk to dawn lighting controlled by photocell alone shall not be  
6 allowed except for building egress lighting. Area lights shall only be  
7 switched on when there is a specific need (e.g. cleaning mirrors and panels,  
8 pumping fuel, persons occupying an area, or alarm situation). When not  
9 needed, lights shall be switched off or dimmed to <20% of their full  
10 operational intensity. Exceptions to dimmed or switched off lighting for  
11 safety purposes shall be articulated in the Lighting Plan.  
12

13 All permanent lighting shall be fully shielded (e.g., full cut-off), except for  
14 collision markers required by FAA or other emergency lighting triggered by  
15 alarms. Such lighting shall be mounted so that no light is emitted above an  
16 imaginary horizontal plane through the fixture.  
17

18 Vehicle mounted lights are preferred over permanently mounted lighting for  
19 nighttime maintenance activities. When possible, such vehicle mounted  
20 lighting shall be aimed toward the ground to avoid causing glare and  
21 skyglow.  
22

23 Retro-reflective or luminescent markers are encouraged in lieu of permanent  
24 lighting.  
25

26 All lighting shall be of minimum intensity to meet safety criteria. When  
27 accurate color rendition is not required (e.g., roadway, basic security),  
28 lighting shall be amber in color, using either low-pressure sodium lamps or  
29 yellow LED lighting, or equivalent. Such lighting reduces skyglow and  
30 wildlife impacts. When white light is required for accurate color rendition, it  
31 shall be equal to 3500° Kelvin color temperature. Bluish-white lighting shall  
32 be prohibited. The Lighting Plan shall include a process for promptly  
33 addressing and mitigating complaints about potential lighting impacts.  
34

35 **VR1-3** In order to minimize night-sky impacts from hazard navigation lighting  
36 associated with solar facilities, the applicant shall use AVWS technology for  
37 any structures exceeding 200 ft (61 m) in height. If the FAA denies a permit  
38 for use of AVWS, the applicant shall limit lighting to the minimum required  
39 to meet FAA safety requirements. The use of red or white strobe lighting  
40 shall be prohibited unless BLM approves its use because of conflicting  
41 mitigation requirements.  
42

43 **VR1-4** The use of signs and project construction signs shall be minimized. Beyond  
44 those required for basic facility and company identification for safety,  
45 navigation, and delivery purposes, commercial symbols or signs and  
46 associated lighting on buildings and other structures shall be prohibited. All

1 commercial symbols and signs and associated lighting shall be designed to  
2 minimize offsite visibility. Necessary signs shall be made of non-glare  
3 materials and utilize unobtrusive colors. The reverse sides of signs and  
4 mounts shall be painted or coated by using the most suitable color selected  
5 from the BLM Standard Environmental Color Chart to reduce contrasts with  
6 the existing landscape; however, placement and design of any signs required  
7 by safety regulations must conform to regulatory requirements..  
8

9 **VR1-5** “Housekeeping” procedures shall be developed to ensure that the site is kept  
10 clean of debris, garbage, fugitive trash or waste, and graffiti; to prohibit scrap  
11 heaps and dumps; and to minimize storage yards. Design features for  
12 effective waste management shall be applied.  
13

14 **VR1-6** “Housekeeping” procedures shall be developed to ensure lands adjacent to  
15 project site are kept clean of debris, garbage, graffiti, fugitive trash or waste  
16 generated onsite, and trackout or runoff dirt. Design features for effective  
17 waste and site management shall be applied.  
18

19 **VR1-7** In addition to mitigation measures that directly reduce the impacts of solar  
20 energy and associated facilities, the off-site mitigation of visual impacts may  
21 be an option in some situations. Off-site mitigation shall be considered in  
22 situations where nonconforming proposed actions may lead to changing the  
23 VRM class objectives through an RMP amendment. Unavoidable visual  
24 impacts may then be mitigated by a correction or remediation of a  
25 nonconforming existing condition resulting from a different proposed action  
26 located within the same viewshed for impacts of approximately equal  
27 magnitude, and within the same or a more protective VRM class. The off-site  
28 mitigation serves as a means to offset and recover the loss of visual landscape  
29 integrity. For example, off-site mitigation could include reclaiming  
30 unnecessary roads, removing abandoned buildings, reclaiming abandoned  
31 mine sites, putting utility lines underground, rehabilitating and revegetating  
32 existing erosion or disturbed areas, or establishing scenic conservation  
33 easements. In situations where off-site mitigation opportunities are absent  
34 within the same viewshed, then different viewsheds that need mitigation of  
35 visual impacts because they could affect highly sensitive visual resources (for  
36 example, along National Scenic and Historic Trails, Wild and Scenic River  
37 corridors, Scenic or Backcountry Byways, etc.) may be considered.  
38 Appropriate offsite mitigation will be determined on a project-specific basis  
39 in consultation with BLM. BLM policy guidance on off-site mitigation  
40 procedures is contained in BLM IM 2008-204, *Offsite Mitigation*.  
41  
42

#### 43 ***A.2.2.13.2 Site Characterization, Siting, and Design Construction***

44  
45 **VR2-1** Project developers shall consult the VRM class designations and associated  
46 management objectives during the early phases of project planning, including

1 those related to project due diligence, site selection, planning, and design. It  
2 is the developer's responsibility to conduct an early investigation of the  
3 respective project's compatibility with the VRM class objectives and the  
4 potential that these objectives can be met by applying thoughtful and creative  
5 design principles. Project developers shall document and demonstrate how  
6 the visual management objectives were factored into the various phases of  
7 project planning and decision rationale. The BLM visual resource inventory  
8 (VRI) class values—including those for scenic quality, sensitivity, and  
9 distance zones—shall also be factored into the project planning, design, and  
10 decision making.

11  
12 **VR2-2** Project developers shall demonstrate how the visual values influence project  
13 design and document how impacts on these values are minimized through  
14 consideration for the proposed project location and its relationship to the  
15 surrounding viewshed. This information shall be included as a part of the  
16 critical due diligence information considered when determining and selecting  
17 solar development sites and ROW boundaries. ROW location, size, and  
18 boundary determinations shall consider terrain characteristics and  
19 opportunities for full or partial project concealment by recessing the project  
20 into the landscape terrain.

21  
22 **VR2-3** Project developers shall consult with the BLM in the early phases of project  
23 planning to help determine the proposed project's potential conformance to  
24 the applicable RMP's VRM class designation and other potential constraints,  
25 thus avoiding costly unforeseen planning implications and re-design.

26  
27 **VR2-4** A qualified professional landscape architect with demonstrated experience  
28 with the BLM's VRM policies and procedures shall be a part of the  
29 developer's and the BLM's respective planning teams, evaluating visual  
30 resource issues as project siting options are considered. The visual issues  
31 shall be addressed throughout the planning and design process, and the final  
32 project plans shall reflect intended methods for mitigating visual impacts.

33  
34 **VR2-5** The appropriate BLM field office and locally based public shall be consulted  
35 to provide input on identifying important visual resources in the project area  
36 and on the siting and design process. The public shall be involved and  
37 informed about the visual site design elements of the proposed solar energy  
38 facilities. Possible approaches include conducting public forums for  
39 disseminating information, offering organized tours of operating solar energy  
40 development projects, and using computer and visualization simulations in  
41 public presentations.

42  
43 **VR2-6** Project developers shall also consult on viewshed protection objectives and  
44 practices with the respective land management agencies that have been  
45 assigned administrative responsibility for landscapes having special  
46 designations, such as Wilderness Areas, National Scenic and Historic Trails,

1 Wild and Scenic Rivers, etc., National Parks, and National Wildlife Refuges  
2 located within the project's viewshed. Developers shall demonstrate a  
3 concerted effort to reconcile conflicts while recognizing that the BLM retains  
4 authority for final decisions determining project approval and conditions.  
5

6 **VR2-7** For applications that include artifacts and remnants of a National Historic  
7 Trail, are located within the viewshed of a National Historic Trail's  
8 designated centerline, or include or are within the viewshed of a trail eligible  
9 for listing on the *National Register of Historic Places* (NRHP) by virtue of its  
10 important historical or cultural values and integrity of setting, the applicant  
11 shall evaluate the potential visual impacts on the trail associated with the  
12 proposed project; minimize, avoid, or mitigate adverse effects through the  
13 Section 106 consultation process; and identify appropriate mitigation  
14 measures for inclusion as stipulations in the POD. This requirement does not  
15 supersede or amend National Historic Trails requirements cited in other  
16 sections but is in addition to and supportive of them.  
17

18 **VR2-8** Landscape settings observed from a unit of the National Park system,  
19 national historic sites, national trails, and Tribal cultural resources may be a  
20 part of the historic context contributing to the historic significance of the site  
21 or trail, project siting shall avoid locating facilities that would alter the visual  
22 setting in a way that would reduce the historic significance or function, even  
23 if compliant with VRM objectives. This requirement does not supersede or  
24 amend national historic sites, national trails, and Tribal cultural resources  
25 requirements cited in other sections but is in addition to and supportive of  
26 them.  
27

28 **VR2-9** Project developers shall obtain topographical data of engineering-design  
29 quality and use digital terrain mapping tools at a landscape-viewshed scale  
30 for project location selection, site planning and design, visual impact  
31 analysis, and visual impact mitigation planning and design. Visual mitigation  
32 planning and design shall be performed through field assessments, applied  
33 global positioning system (GPS) technology, photo documentation, use of  
34 computer-aided design and development software, three-dimensional GIS  
35 modeling software, and imaging software to depict visual simulations to  
36 reflect a full range of visual resource mitigation measures. The digital terrain  
37 mapping tools shall be at a resolution and contour interval suitable for site  
38 design and accurate placement of proposed developments into the digital  
39 viewshed. Visual simulations shall be prepared and evaluated in accordance  
40 with BLM Handbook H-8431-1 and other agency directives, to create  
41 spatially accurate and realistic depictions of the appearance of proposed  
42 facilities. Simulations shall depict proposed project facilities from key  
43 observation points (KOPs) and other visual resource sensitive locations.  
44

45 **VR2-10** The siting and design of solar facilities, structures, roads, and other project  
46 elements shall explore and document design considerations for repeating the

1 natural form, line, color, and texture of the existing landscape in accordance  
2 and compliance with the VRM class objectives.

3  
4 **VR2-11** The full range of visual BMPs shall be considered, and plans shall  
5 incorporate all pertinent BMPs. Visual resource monitoring and compliance  
6 strategies shall be included as a part of the project mitigation plans to cover  
7 the construction, operation, and decommissioning phases.

8  
9 **VR2-12** Conformance with VRM objectives shall be determined through the use of  
10 the BLM contrast rating procedures defined in BLM Handbook H-8431-1.  
11 Visual contrast rating mitigation of visual impacts shall abide by the  
12 requirements outlined in the handbook and other BLM directives. Plans for  
13 facilities determined not to be in conformance with VRM objectives either  
14 shall not be approved or shall be redesigned in order to meet the VRM  
15 objectives, and updated visual simulations shall be prepared. Revised project  
16 plans and simulations shall be reevaluated by using the contrast rating  
17 procedures and repeated until the proposed action is found to be in  
18 conformance.

19  
20 **VR2-13** KOPs shall be selected by first determining the extent of the viewshed by  
21 using the viewshed modeling tools previously cited. The viewshed modeling  
22 shall illustrate the areas from which the proposed facilities may be seen out to  
23 25 mi (40 km)—line-of-sight measured from the top elevations of facilities  
24 out to 5.5 ft (1.7 m) above the ground terrain. From within the areas, KOPs  
25 would then be selected at places where people would be expected: at scenic  
26 overlooks, roads, trails, campgrounds, recreationally active river corridors,  
27 residential areas, etc. For the purpose of conducting a visual contrast rating  
28 evaluation, the number of KOPs would be reduced to those that serve as the  
29 best representations for demonstrating conformance to the respective VRM  
30 class objectives. The BLM must approve KOP selections, and the BLM  
31 reserves the right to require additional KOPs to further determine the extent  
32 of visual impact and conformance to VRM class objectives.

33  
34 **VR2-14** Visual design elements shall be integrated into the construction plans, details,  
35 shop drawings, and specifications through a Visual Resource Monitoring and  
36 Compliance Plan; these shall include, but not be limited to, grubbing and  
37 clearing, vegetation thinning and clearing, grading, revegetation, drainage,  
38 and structural plans. Visual design elements within the plan shall be  
39 measureable and monitored while under construction, while operational, and  
40 when decommissioned. The plan shall include monitoring and compliance  
41 elements that establish the monitoring requirements and thresholds for  
42 acceptable performance. The contrast rating procedures shall also be  
43 integrated as a field measuring compliance tool during operations and after  
44 decommissioning.

45

- 1 **VR2-15** Project developers shall exhaust opportunities to minimize visual dominance  
2 of projects by siting projects outside the viewsheds of KOPs or by siting  
3 them as far away as possible, diminishing dominance by maximizing visible  
4 separation with distance.  
5
- 6 **VR2-16** Facility siting shall incorporate measures to minimize the profile of all  
7 facility-related structures to reduce visibility and visual dominance within  
8 the viewshed—particularly for facilities proposed within the foreground/  
9 middleground distance zone (0–5 mi [0–8 km]) of sensitive viewing locations  
10 with extended viewing opportunities and/or moving viewpoints including,  
11 but not limited to, National Scenic Byways, All-American Roads, State  
12 Scenic Byways, BLM Backcountry Byways, Special Recreation Management  
13 Areas (SRMAs), trails, residential areas, etc.  
14
- 15 **VR2-17** Siting shall take advantage of both topography and vegetation as screening or  
16 partially screening devices to interrupt and restrict the views of projects from  
17 KOPs and visually sensitive areas.  
18
- 19 **VR2-18** Locating facilities near visually prominent landscape features (e.g., knobs  
20 and waterfalls) that naturally draw an observer’s attention shall be avoided.  
21
- 22 **VR2-19** Visual “skylining” shall be avoided by placing structures, transmission lines,  
23 and other facilities away from ridgelines, summits, or other locations where  
24 they would silhouette against the sky from important viewing locations.  
25 Siting shall take advantage of opportunities to use topography as a backdrop  
26 for views of facilities and structures to avoid skylining. Alternatives shall be  
27 evaluated, and the least visually intrusive option shall be selected when linear  
28 facilities (e.g. transmission lines) cross over ridgelines.  
29
- 30 **VR2-20** Siting of linear features (e.g., ROWs and roads) shall follow natural land  
31 contours rather than straight lines, particularly up slopes. Fall-line cuts shall  
32 be avoided. Following natural contours echoes the lines found in the natural  
33 landscape and often reduces cut-and-fill requirements; straight lines can  
34 introduce conspicuous linear contrasts that appear unnatural.  
35
- 36 **VR2-21** Linear developments (e.g., transmission lines, pipelines, roads) shall follow  
37 the edges of natural clearings or natural lines of transition between vegetation  
38 type, topography, etc. (where they would be less conspicuous), rather than  
39 pass through the center of clearings.  
40
- 41 **VR2-22** In visually sensitive areas, air transport capability shall be used to mobilize  
42 equipment and materials for clearing, grading, and erecting transmission  
43 towers, thereby preserving the natural landscape conditions between tower  
44 locations and reducing the need for permanent and/or temporary access  
45 roads.  
46

- 1 **VR2-23** Vegetation and ground disturbance shall be minimized, and shall take  
2 advantage of existing clearings.  
3
- 4 **VR2-24** Structures and roads shall be designed and located to minimize and balance  
5 cuts and fills. Retaining walls, binwalls, half bridges, and tunnels shall be  
6 used to reduce cut and fill.  
7
- 8 **VR2-25** Road-cut slopes shall be rounded, and the cut-and-fill pitch shall be varied to  
9 reduce contrasts in form and line; the slope shall be varied to preserve  
10 specimen trees and nonhazardous rock outcroppings.  
11
- 12 **VR2-26** Natural or previously excavated bedrock landforms shall be sculpted and  
13 shaped when excavation of these landforms is required. Percent backslope,  
14 benches, and vertical variations shall be integrated into a final landform that  
15 repeats the natural shapes, forms, textures, and lines of the surrounding  
16 landscape. The earthen landform shall be integrated and transitioned into the  
17 excavated bedrock landform. Sculpted rock face angles, bench formations,  
18 and backslope need to adhere to the natural bedding planes of the natural  
19 bedrock geology. Half-case drill traces from pre-split blasting shall not  
20 remain evident in the final rock face. The color contrast from the excavated  
21 rock faces shall be removed by color treating with a rock stain. Native  
22 vegetation (where feasible) or a mix of native and non-native species (if  
23 necessary to ensure successful revegetation) shall be reestablished with the  
24 benches and cavities created within the created bedrock formation.  
25
- 26 **VR2-27** Where screening topography and vegetation are absent or minimal, natural-  
27 looking earthwork landforms, vegetative, or architectural screening shall be  
28 used to minimize visual impacts. The shape and height of earthwork  
29 landforms must be adapted to the surrounding landscape, and must consider  
30 the distance and viewing angle from KOPs in order to ensure that the  
31 earthworks are visually unobtrusive.  
32
- 33 **VR2-28** Openings in vegetation for facilities, structures, roads, etc., shall be feathered  
34 and shaped to repeat the size, shape, and characteristics of naturally occurring  
35 openings.  
36
- 37 **VR2-29** Topsoil from the site shall be stripped, stockpiled, and stabilized before  
38 excavating earth for facility construction.  
39
- 40 **VR2-30** All electrical collector lines and pipelines shall be buried in a manner that minimizes  
41 additional surface disturbance where feasible(e.g., along roads or other paths of  
42 surface disturbance). As feasible, these lines shall be enclosed in conduit to minimize  
43 the potential for animals to chew through the electrical lines.  
44
- 45 **VR2-31** Visual impacts associated with solar energy and electricity transmission  
46 projects shall be mitigated by choosing appropriate building and structural



- 1 materials and surface treatments (i.e., paints or coatings designed to reduce  
2 contrast and reflectivity).  
3
- 4 **VR2-32** A careful study of the site shall be performed to identify appropriate colors  
5 and textures for materials; both summer and winter appearance shall be  
6 considered, as well as seasons of peak visitor use.  
7
- 8 **VR2-33** Massing and scale of structures and the architectural character appropriate to  
9 the region where a solar facility is to be located shall be considered.  
10
- 11 **VR2-34** Architectural character considerations shall include integration of vertical  
12 and horizontal relief variation to create shadow lines that diminish the overall  
13 visual scale and dominance of facilities.  
14
- 15 **VR2-35** The choice of colors shall be based on the appearance at typical viewing  
16 distances and consider the entire landscape around the proposed  
17 development. Appropriate colors for smooth surfaces often need to be two to  
18 three shades darker than the background color to compensate for shadows  
19 that darken most textured natural surfaces. The BLM Standard  
20 Environmental Color Chart CC-001 and guidance shall be referenced when  
21 selecting colors.  
22
- 23 **VR2-36** Materials and surface treatments shall repeat and/or blend with the existing  
24 form, line, color, and texture of the landscape.  
25
- 26 **VR2-37** Appropriately colored materials shall be selected for structures, or  
27 appropriate stains/coatings shall be applied to blend with the project's  
28 backdrop.  
29
- 30 **VR2-38** Solar panel/mirror/heliostat backs/supports shall be color-treated to reduce  
31 visual contrast with the landscape setting.  
32
- 33 **VR2-39** Solar towers shall be color-treated to reduce visual contrast.  
34
- 35 **VR2-40** Materials, coatings, or paints having little or no reflectivity shall be used  
36 whenever possible.  
37
- 38 **VR2-41** Grouped structures shall be painted the same color to reduce visual  
39 complexity and color contrast.  
40
- 41 **VR2-42** Multiple color camouflage technology applications shall be considered for  
42 projects within sensitive viewsheds and with a visibility distance that is  
43 between 0.25 and 2 mi (0.40 and 3.20 km). BLM guidance on the use of  
44 color to mitigate visual impacts shall be consulted.  
45

- 1 **VR2-43** Aboveground pipelines shall be painted or coated to match their  
2 surroundings.  
3
- 4 **VR2-44** Consideration shall be given to the appropriate choice of monopoles vs.  
5 lattice towers for a given landscape setting. Monopoles may reduce visual  
6 impacts more effectively than lattice towers in foreground and midground  
7 views within built or partially built environments, while lattice towers tend to  
8 be more appropriate for less-developed rural landscapes, where the  
9 latticework would be more transparent against background textures and  
10 colors.  
11
- 12 **VR2-45** Electricity transmission/distribution projects shall utilize nonspecular  
13 conductors and nonreflective coatings on insulators.  
14
- 15 **VR2-46** The use of signs and project construction signs shall be minimized.  
16 Necessary signs shall be made of nonglare materials and utilize unobtrusive  
17 colors. The reverse sides of signs and mounts shall be painted or coated by  
18 using the most suitable color selected from the BLM Standard Environmental  
19 Color Chart to reduce color contrasts with the existing landscape; however,  
20 placement and design of any signs required by safety regulations must  
21 conform to regulatory requirements.  
22
- 23 **VR2-47** A pre-construction meeting with BLM landscape architects or other  
24 designated visual/scenic resource specialists shall be held before construction  
25 begins to coordinate the VRM mitigation strategy and confirm the  
26 compliance-checking schedule and procedures. Final design and construction  
27 documents will be reviewed for completeness with regard to the visual  
28 mitigation elements, assuring that requirements and commitments are  
29 adequately addressed. The construction documents shall include, but not be  
30 limited to, grading, drainage, revegetation, vegetation clearing and feathering  
31 plans, and they must demonstrate how VRM objectives will be met,  
32 monitored, and measured for conformance.  
33
- 34 **VR2-48** Project developers shall integrate interim/final reclamation VRM mitigation  
35 elements early in the construction process; these may include treatments,  
36 such as thinning and feathering vegetation along project edges, enhanced  
37 contour grading, salvaging landscape materials from within construction  
38 areas, special revegetation requirements, etc. Developers shall coordinate  
39 with BLM in advance to have BLM landscape architects or other designated  
40 visual/scenic resource specialists on-site during construction to work on  
41 implementing visual resource requirements and BMPs.  
42
- 43 **VR2-49** Project developers shall reduce visual impacts during construction by clearly  
44 delineating construction boundaries and minimizing areas of surface  
45 disturbance; preserving vegetation to the greatest extent possible; utilizing  
46 undulating surface disturbance edges; stripping, salvaging, and replacing

- 1 topsoil; using contoured grading; controlling erosion; using dust suppression  
2 techniques; and restoring exposed soils to their original contour and  
3 vegetation.  
4
- 5 **VR2-50** A Decommissioning and Site Reclamation Plan shall be in place prior to  
6 construction. Reclamation of the construction site shall begin immediately  
7 after construction to reduce the likelihood of visual contrasts associated  
8 with erosion and invasive weed infestation and to reduce the visibility of  
9 temporarily disturbed areas as quickly as possible.  
10
- 11 **VR2-51** Visual impact mitigation objectives and activities shall be discussed with  
12 equipment operators before construction activities begin.  
13
- 14 **VR2-52** Existing rocks, vegetation, and drainage patterns shall be preserved to the  
15 maximum extent possible.  
16
- 17 **VR2-53** Brush-beating, mowing, or using protective surface matting rather than  
18 removing vegetation shall be employed where feasible.  
19
- 20 **VR2-54** Slash from vegetation removal shall be mulched and spread to cover fresh  
21 soil disturbances as part of the Integrated Vegetation Management Plan.  
22 Slash piles shall not be left in sensitive viewing areas.  
23
- 24 **VR2-55** All areas of disturbed soil shall be reclaimed by using weed-free native  
25 grasses, forbs, and shrubs representative of the surrounding and intact native  
26 vegetation composition and/or using non-native species, if necessary, to  
27 ensure successful revegetation.  
28
- 29 **VR2-56** The visual color contrast of graveled surfaces shall be reduced with approved  
30 color treatment practices.  
31
- 32 **VR2-57** Horizontal and vertical pipeline bending shall be used in place of cut-and-fill  
33 activities where feasible.  
34
- 35 **VR2-58** Road-cut slopes shall be rounded, and the cut-and-fill pitch shall be varied to  
36 reduce contrasts in form and line. The slope shall be varied to preserve  
37 specimen trees and nonhazardous rock outcroppings.  
38
- 39 **VR2-59** Topsoil from cut-and-fill activities shall be segregated and spread on freshly  
40 disturbed areas to reduce color contrast and aid rapid revegetation. Topsoil  
41 piles shall not be left in sensitive viewing areas.  
42
- 43 **VR2-60** Excess fill material shall not be disposed of downslope, in order to avoid  
44 creating color contrast with existing vegetation and soils.  
45

- 1 **VR2-61** Excess cut-and-fill materials shall be hauled in or out to minimize ground  
2 disturbance and impacts from fill piles.  
3
- 4 **VR2-62** Natural or previously excavated bedrock landforms shall be sculpted and  
5 shaped when excavation of these landforms is required, and landforms shall  
6 conform to the requirements listed and further described under A.2.2.13.1,  
7 Siting and Design. Half-case drill traces from pre-split blasting shall not  
8 remain evident in the final rock face. The color contrast from the excavated  
9 rock faces shall be removed by color-treating with a rock stain. Native  
10 vegetation (where feasible) or a mix of native and non-native species (if  
11 necessary to ensure successful revegetation) shall be reestablished with the  
12 benches and cavities created within the created bedrock formation.  
13
- 14 **VR3-63** Communication and other local utility cables shall be buried where feasible.  
15
- 16 **VR2-64** Culvert ends shall be painted or coated to reduce color contrasts with the  
17 existing landscape.  
18
- 19 **VR2-65** No paint or permanent discoloring agents shall be applied to rocks or  
20 vegetation to indicate surveyor construction activity limits.  
21
- 22 **VR2-66** All stakes and flagging shall be removed from the construction area and  
23 disposed of in an approved facility.  
24  
25

### 26 *A.2.2.13.3 Operations and Maintenance*

27

- 28 **VR3-1** Terms and conditions for VRM mitigation compliance shall be maintained  
29 and monitored for compliance with visual objectives, adaptive management  
30 adjustments, and modifications, as necessary and approved by the BLM  
31 landscape architect or other designated visual/scenic resource specialist.  
32
- 33 **VR3-2** The project developer shall maintain revegetated surfaces until a self-  
34 sustaining stand of vegetation is reestablished and visually adapted to the  
35 undisturbed surrounding vegetation. No new disturbance shall be created  
36 during operations without completion of a VRM analysis and approval by the  
37 authorized officer.  
38
- 39 **VR3-3** Interim restoration shall be undertaken during the operating life of the project  
40 as soon as possible after disturbances.  
41
- 42 **VR3-4** Maintenance activities shall include dust abatement (in arid environments)  
43 and noxious weed control.  
44
- 45 **VR3-5** Road maintenance activities shall avoid blading existing forbs and grasses in  
46 ditches and adjacent to roads.

- 1 **VR3-6** Painted facilities shall be kept in good repair and repainted when the color  
2 fades or flakes.  
3
- 4 **VR3-7** Color-treated solar panel/mirror/heliostat backs/supports shall be kept in  
5 good repair and be retreated when the color fades and flakes.  
6
- 7 **VR3-8** Mirrors/heliostats shall be deployed and operated to avoid high-intensity light  
8 (glare) being reflected toward off-site ground receptors. Where off-site glare  
9 is unavoidable and project site/off-site spatial relationships favor effective  
10 results, fencing with privacy slats or similar screening materials shall be  
11 employed.  
12  
13

#### 14 ***A.2.2.13.4 Reclamation and Decommissioning***

- 15
- 16 **VR4-1** A Decommissioning and Site Reclamation Plan, covering visual impact  
17 design features, shall be in place prior to construction, and reclamation  
18 activities shall be undertaken as soon as possible after disturbances occur and  
19 be maintained throughout the life of the project. The following  
20 decommissioning/reclamation activities/practices can partially mitigate visual  
21 impacts associated with solar energy development, where feasible.  
22
- 23 **VR4-2** Predevelopment visual conditions and the inventoried visual quality rating  
24 (A, B, C) and integrity shall be reviewed, and the visual elements of form,  
25 line, color, and texture shall be restored to predevelopment visual  
26 compatibility or to that of the surrounding landscape setting conditions,  
27 whichever achieves the better visual quality and most ecologically sound  
28 outcome.  
29
- 30 **VR4-3** A Decommissioning and Site Reclamation Plan shall be developed, approved  
31 by the BLM, and implemented. The plan shall require that all aboveground  
32 and near-ground structures be removed. Some structures shall only be  
33 removed to a level below the ground surface that will allow reclamation/  
34 restoration. Topsoil from all decommissioning activities shall be salvaged  
35 and reapplied during final reclamation. The plan shall include provisions for  
36 monitoring and determining compliance with the project's visual mitigation  
37 and reclamation objectives.  
38
- 39 **VR4-4** Soil borrow areas, cut-and-fill slopes, berms, water bars, and other disturbed  
40 areas shall be contoured to approximate naturally occurring slopes, thereby  
41 avoiding form and line contrasts with the existing landscapes. Contouring to  
42 a rough texture would trap seeds and discourage off-road travel, thereby  
43 reducing associated visual impacts.  
44
- 45 **VR4-5** Cut slopes shall be randomly scarified and roughened to reduce texture  
46 contrasts with existing landscapes and aid in revegetation.

- 1 **VR4-6** A combination of seeding, planting nursery stock, and transplanting local  
2 vegetation within the proposed disturbance areas and staging of construction  
3 enabling direct transplanting shall be considered. Where feasible, native  
4 vegetation shall be used for revegetating, to establish a composition  
5 consistent with the form, line, color, and texture of the surrounding  
6 undisturbed landscape.  
7
- 8 **VR4-7** Stockpiled topsoil shall be reapplied to disturbed areas, and the areas shall be  
9 revegetated by using a mix of native species selected for visual compatibility  
10 with existing vegetation, where applicable, or by using a mix of native and  
11 non-native species if necessary to ensure successful revegetation.  
12
- 13 **VR4-8** Gravel and other surface treatments shall be removed or buried.  
14
- 15 **VR4-9** Rocks, brush, and forest debris shall be restored whenever possible to  
16 approximate pre-existing visual conditions.  
17
- 18 **VR4-10** Edges of revegetated areas shall be feathered to reduce form and line  
19 contrasts with the existing landscapes.  
20
- 21 **VR4-11** The Visual Resource Monitoring and Compliance Plan shall be prepared by  
22 the operator and approved by the BLM that establishes the schedule and  
23 terms for monitoring during decommissioning and the conditions and  
24 methods of measurement for determining compliance.  
25

#### 26 **A.2.2.14 Design Features for Noise**

27  
28  
29 The following design features were identified to avoid, reduce, and/or mitigate potential  
30 impacts on acoustic environment from solar development that were identified and discussed in  
31 Sections 5.13.1 and 5.13.2 of the Draft and Final Solar PEIS.  
32

##### 33 **A.2.2.14.1 General**

- 34  
35
- 36 **N1-1** All equipment shall be maintained in working order in accordance with  
37 manufacturers' specifications. For example, suitable mufflers and/or air-inlet  
38 silencers shall be installed on all internal combustion engines (ICEs) and  
39 certain compressor components.  
40
- 41 **N1-2** If residences or sensitive receptors are nearby, noisy equipment, such as  
42 turbines and motors, shall be placed in enclosures.  
43
- 44 **N1-3** All vehicles traveling within and around the project area shall be operated in  
45 accordance with posted speed limits to reduce vehicle noise levels.  
46

- 1 **N1-4** Warning signs shall be posted in high-noise areas, and a hearing protection  
2 program shall be implemented for work areas with noise in excess of  
3 85 dBA.  
4
- 5 **N1-5** Project developers shall realize that complaints about noise may still occur,  
6 even when the noise levels from the facility do not exceed regulatory levels.  
7 Accordingly, a noise complaint process and hotline for the surrounding  
8 communities shall be implemented, including documentation, investigation,  
9 evaluation, and resolution of all legitimate project-related noise complaints.  
10
- 11 **N1-6** If helicopters are used for installation of transmission lines, flights at low  
12 altitude (under 1,500 ft [457 m]) near noise-sensitive receptors shall be  
13 minimized except at locations where only helicopter activities can perform  
14 the task.  
15

16  
17 ***A.2.2.14.2 Site Characterization, Siting, and Design Construction***  
18

- 19 **N2-1** Construction activities and construction traffic shall be scheduled to  
20 minimize disruption to nearby residents and existing operations surrounding  
21 the project areas.  
22
- 23 **N2-2** If residences or sensitive receptors are nearby, noisy construction activities  
24 shall be limited to the least noise-sensitive times of day (daytime between  
25 7 a.m. and 7 p.m.) and weekdays. Quieter activities, such as instrumentation  
26 or interior installation, could be conducted at any time.  
27
- 28 **N2-3** Whenever feasible, different noisy activities shall be scheduled to occur at  
29 the same time, since additional sources of noise generally do not increase  
30 noise levels at the site boundary by much. That is, less-frequent but noisy  
31 activities would generally be less annoying than lower-level noise occurring  
32 more frequently.  
33
- 34 **N2-4** Noise control measures (e.g., erection of temporary wooden noise barriers)  
35 shall be implemented if noisy activities are expected near sensitive receptors.  
36
- 37 **N2-5** If noisy activities such as blasting or pile driving are required during the  
38 construction period, nearby residents shall be notified in advance.  
39
- 40 **N2-6** Project developers shall take measurements to assess the existing background  
41 ambient sound levels both within and outside the project site and compare  
42 these with the anticipated noise levels associated with the proposed facility.  
43 The ambient measurement protocols of all affected land management  
44 agencies shall be considered and utilized. Nearby residences and likely  
45 sensitive human and wildlife receptor locations shall be identified at this  
46 time.

- 1 **N2-7** Siting of stationary construction equipment (e.g., compressors and  
2 generators) shall be far from nearby residences and other sensitive receptors.  
3
- 4 **N2-8** Permanent sound-generating facilities (e.g., compressors, pumps) shall be  
5 sited away from residences and other sensitive receptors. In areas of known  
6 conflicts, acoustic screening will be required.  
7
- 8 **N2-9** Where feasible, low-noise systems (e.g., for ventilation systems, pumps,  
9 generators, compressors, and fans) shall be incorporated, and equipment that  
10 has no prominent discrete tones shall be selected.  
11
- 12 **N2-10** If a wet cooling tower is to be used, the louvered side shall be sited to face  
13 away from sensitive receptors. The cooling tower shall be located in such a  
14 manner that nearby equipment can act as a barrier and further reduce noise.  
15 Quieter fans shall be selected in the facility design, and fans operated at a  
16 lower speed, particularly if they are to operate at night. If a high degree of  
17 reduction in noise is required, silencers shall be used on the fan stacks.  
18
- 19 **N2-11** Noise reduction measures that shall be considered include siting noise  
20 sources to take advantage of topography and distance and constructing  
21 engineered sound barriers and/or berms or sound-insulated buildings, if  
22 needed, to reduce potential noise impacts at the locations of nearby sensitive  
23 receptors. As an alternative, solar facilities generating higher operational  
24 noise (e.g., a solar dish engine facility) could take advantage of higher  
25 background noise. For example, they could be sited within an existing noisy  
26 area, such as close to a well-traveled highway, where the ambient sounds  
27 partially mask the noise from the facility.  
28  
29

#### 30 ***A.2.2.14.3 Operations and Maintenance***

- 31
- 32 **N3-1** Noise levels from cooling systems equipped with TES should be managed so  
33 that levels at the nearest residences and specially designated areas near the  
34 facility boundary are kept within applicable guidelines. This could be  
35 accomplished in several ways, for example, through placing the power block  
36 far from residences, limiting operations to a few hours after sunset, and/or  
37 installing fan silencers. Section 5.13.2.1 discusses noise impacts from TES  
38 systems.  
39
- 40 **N3-2** Dish engine facilities shall be managed so that noise levels at the nearest  
41 residences and specially designated areas near the facility boundary are kept  
42 within applicable guidelines. This could be accomplished in several ways, for  
43 example, through placing dish engines far from nearby residences, or through  
44 direct noise control engineering applied to individual dish engine systems or  
45 components. Section 5.13.2.2 discusses noise impacts from dish engine  
46 facilities.



1 **N3-3** If a noise from a transformer becomes an issue, a new transformer with  
2 reduced flux density, which generates noise levels as much as 10 to 20 dB  
3 lower than National Electrical Manufacturers Association (NEMA) standard  
4 values, shall be installed. Alternatively, barrier walls, partial enclosures, or  
5 full enclosures shall be adopted to shield or contain the transformer noise,  
6 depending on the degree of noise control needed.  
7  
8

9 ***A.2.2.14.4 Reclamation and Decommissioning***

10  
11 **N4-1** Decommissioning activities shall be scheduled to minimize disruption to  
12 nearby residents and existing operations surrounding the project areas.  
13 Impacts from decommissioning are discussed in Section 5.13.1.4.  
14

15 **N4-2** If residences or sensitive receptors are nearby, noisy decommissioning  
16 activities shall be limited to the least noise-sensitive times of day (daytime  
17 between 7 a.m. and 7 p.m.) and weekdays. Quieter activities, such as  
18 instrumentation or interior installation, could be conducted at any time.  
19

20 **N4-3** If noisy activities such as blasting are required during the decommissioning  
21 period nearby residents shall be notified in advance.  
22  
23

24 ***A.2.2.15 Design Features for Paleontological Resources***

25  
26 The following design features were identified to avoid, reduce, and/or mitigate potential  
27 impacts on paleontological resources from solar development that were identified and discussed  
28 in Sections 5.14.1 and 5.14.2 of the Draft and Final Solar PEIS.  
29  
30

31 ***A.2.2.15.1 General***

32  
33 **P1-1** Coordination between the project developer and the BLM shall be required for all  
34 projects before areas are developed. The use of management practices, such as  
35 training/education programs to reduce the amount of inadvertent destruction to  
36 paleontological sites (see P1-4 below), could reduce the occurrences of human-related  
37 disturbances to nearby sites. The specifics of these management practices shall be  
38 established in project-specific coordination between the project developer and the  
39 BLM. BLM IM 2009-011 provides guidance for assessing potential impacts on  
40 paleontological resources and determining mitigation measures.  
41

42 **P1-2** Project developers shall determine in coordination with the BLM whether  
43 paleontological resources exist in a project area on the basis of the following:  
44 the sedimentary context of the area and its potential to contain  
45 paleontological resources (potential fossil yield classification [PFYC] class,  
46 if it is available); a records search of published and unpublished literature for

1 past paleontological finds in the area; coordination with paleontological  
2 researchers working locally in potentially affected geographic areas and  
3 geologic strata; and/or depending on the extent of existing information, the  
4 completion of a paleontological survey.  
5

6 **P1-3** If paleontological resources are present at the site or if areas with a high  
7 potential to contain paleontological material have been identified, a  
8 Paleontological Resources Management Plan shall be developed. This shall  
9 include a mitigation plan; mitigation may include avoidance, removal of  
10 fossils (data recovery), stabilization, monitoring, use of protective barriers  
11 and signs, or use of other physical or administrative protection measures. The  
12 Paleontological Resources Management Plan shall also identify measures to  
13 prevent potential looting/vandalism or erosion impacts and address the  
14 education of workers and the public to make them aware of the consequences  
15 of unauthorized collection of fossils on public land.  
16

17 **P1-4** Key elements to mitigate the impacts to paleontological resources shall be  
18 incorporated into a Worker Education and Awareness Plan (WEAP) that is  
19 provided to all project personnel prior to entering the project work site. The  
20 WEAP shall be provided on a regular basis, covering multiple resources, to  
21 ensure the awareness of key mitigation efforts for paleontological resources  
22 of the project work site during all phases of the project's life. The base  
23 information the WEAP provides shall be reviewed and approved by BLM  
24 prior to the issuance of a Notice to Proceed and incorporate adaptive  
25 management protocols for addressing changes over the life of the project,  
26 should they occur.  
27

#### 28 ***A.2.2.15.2 Site Characterization, Siting, and Design Construction***

29  
30  
31 **P2-1** If an area has a high potential for fossils but no fossils are observed during a  
32 survey if completed, monitoring by a qualified paleontologist may be  
33 required by the BLM during all excavation and earthmoving activities in the  
34 sensitive area. Development of a Paleontological Resources Monitoring Plan  
35 is will be required and approvable by BLM prior to a Notice to Proceed.  
36

37 **P2-2** If fossils are discovered during construction, the BLM shall be notified  
38 immediately. Work shall be halted at the fossil site and continued elsewhere  
39 until a qualified paleontologist can visit the site, determine the significance of  
40 the find, and, if significant, make site-specific recommendations for  
41 collection or other resource protection. The area of the discovery shall be  
42 protected to ensure that the fossils are not removed, handled, altered, or  
43 damaged until the site is properly evaluated and further action determined.  
44  
45

1           **A.2.2.16 Design Features for Cultural Resources**  
2

3           The following design features were identified to avoid, reduce, and/or mitigate potential  
4 impacts on cultural resources from solar development that were identified and discussed in  
5 Sections 5.15.1 and 5.15.2 of the Draft and Final Solar PEIS.  
6

7  
8           **A.2.2.16.1 General**  
9

10 **CR1-1**     Section 106 consultations between the BLM and SHPOs, appropriate Tribes,  
11           and other consulting parties shall be required beginning early in the planning  
12           process. Thresholds for the involvement of and review by the Advisory  
13           Council on Historic Preservation (ACHP) include nonroutine interstate  
14           and/or interagency programs; undertakings directly and adversely affecting  
15           National Historic Landmarks or National Register eligible properties of  
16           national significance; and/or highly controversial undertakings when ACHP  
17           review is requested by the BLM, SHPO, Indian Tribe, local government, or  
18           applicant for a BLM authorization. Ongoing Tribal consultation, in  
19           accordance with the NHPA, would help in determining areas of sensitivity,  
20           appropriate survey and mitigation needs, and other issues of concern (such as  
21           access rights or disruption of cultural practices) and taking those concerns  
22           into consideration during project development. The following describes the  
23           process that the BLM follows to address impacts on historic properties for  
24           individual projects.  
25

26 **CR1-2**     Site-specific NEPA analyses and a Section 106 review shall be conducted  
27           on individual projects. The BLM will require the completion of comprehensive  
28           identification (e.g., field inventory), evaluation, protection, and mitigation following  
29           the policies and procedures contained in the BLM National Programmatic Agreement  
30           (PA), as amended in 2012, and under state protocols.<sup>4</sup> If significant cultural resources  
31           are present at the project location or if there is a high potential for the project area to  
32           contain significant cultural resources that could be adversely affected, a formalized  
33           agreement may be required to address management and mitigation options  
34           (e.g., avoidance, data recovery, monitoring, preventative measures for  
35           looting/vandalism and erosion, and worker education) in the form of various planning  
36           documents (e.g., Cultural Resources Management and Mitigation Plan (including  
37           specifications for data recovery), Historic Properties Treatment Plan, etc.). The  
38           agreement shall be developed in consultation with the SHPO, appropriate federally  
39           recognized Tribes, and any consulting parties. Also, the BLM will continue to  
40           implement government-to-government consultation with Tribes and state and  
41           local governments on a case-by-case basis.  
42

---

<sup>4</sup> A PA specific to solar development on BLM-administered lands is under development by the BLM, SHPOs from the six states, and ACHP. This paragraph will be replaced with a summary of relevant information from the Solar PA once it is completed.

1 **CR1-3** The use of management practices, such as training/education programs for  
2 workers and the public see also CR1-6), shall be implemented to reduce  
3 occurrences of human-related disturbances to nearby cultural sites. The  
4 specifics of these management practices shall be established in project-  
5 specific consultations between the applicant and the BLM as well as with the  
6 SHPO and Tribes, as appropriate.  
7

8 **CR1-4** The unexpected discovery of cultural resources during any phase of  
9 development (construction, operations and maintenance, and  
10 decommissioning) shall be brought to the attention of the responsible BLM  
11 authorized officer immediately. Work shall be halted in the vicinity of the  
12 find. The area of the find shall be protected to ensure that resources are not  
13 removed, handled, altered, or damaged while they are being evaluated and to  
14 ensure that appropriate mitigation measures are being developed.  
15

16 **CR1-5** The BLM will consult with the appropriate SHPOs, the ACHP, and/or  
17 affected Native American governments and notify the public early in the  
18 planning process to identify issues and areas of concern regarding any  
19 proposed solar energy project. Such consultation is required by the NHPA  
20 and other authorities.  
21

22 **CR1-6** Key elements to mitigate the impacts to cultural resources shall be  
23 incorporated into a Worker Education and Awareness Plan (WEAP) that is  
24 provided to all project personnel prior to entering the project work site. The  
25 WEAP shall be provided on a regular basis, covering multiple resources, to  
26 ensure the awareness of key cultural resource mitigation efforts at the project  
27 work site during all phases of the projects life. The base information the  
28 WEAP provides shall be reviewed and approved by BLM prior to the  
29 issuance of a Notice to Proceed and incorporate adaptive management  
30 protocols for addressing changes over the life of the project, should they  
31 occur.  
32

33 **CR1-7** The BLM will require a Performance and Reclamation bond for all solar  
34 energy projects. This will ensure compliance with the terms and conditions of  
35 the ROW authorization. When establishing bond amounts and conditions, the  
36 BLM authorized officer will require coverage of personnel and contracting  
37 expenses tied to cultural resources identification, protection, and mitigation  
38 of effects. These may include, but are not limited to, ethnographic studies,  
39 inventory, testing, geomorphological studies, data recovery, curation,  
40 monitoring, treatment of damaged sites, and submission of reports (see ROW  
41 authorization policies, Section 2.2.2.1).  
42  
43

1 **A.2.2.16.2 Site Characterization, Siting, and Design Construction**

- 2
- 3 **CR2-1** The use of previously disturbed lands, rather than pristine lands, shall be  
4 encouraged.
- 5
- 6 **CR2-2** Project developers shall conduct a records search of published and  
7 unpublished literature for past cultural resource finds in the area; coordinate  
8 with researchers working locally in the area; and, depending on the extent of  
9 existing information, develop a survey design in coordination with the BLM  
10 and SHPO and complete a Class III cultural resources inventory. The  
11 inventory shall be conducted according to the standards set forth in the  
12 Secretary of Interior's *Standards and Guidelines for Archaeology and*  
13 *Historic Preservation* (48 FR 44716); BLM Handbook H-8110: *Guidelines*  
14 *for Identifying Cultural Resources*, and revised BLM Manual 8110; and  
15 applicable state-specific BLM or SHPO survey, site record, or reporting  
16 standards. All inventory data must be provided to the BLM in digitized  
17 format that meets the BLM accuracy standards, including shape files for  
18 surveyed areas.
- 19
- 20 **CR2-3** When archaeological sites are unlikely to be exposed on the surface due to  
21 geological conditions, the BLM may require geomorphological testing to  
22 discover buried cultural deposits. Such techniques may include augering,  
23 trenching, or other discovery techniques needed to identify cultural deposits  
24 in a buried context.
- 25
- 26 **CR2-4** A phased sampling strategy, beginning with a Class II inventory to assess  
27 various alternative development areas, is recommended prior to the selection  
28 of individual project locations. The Class II inventory shall meet the  
29 standards set forth in the Secretary of Interior's *Standards and Guidelines for*  
30 *Archaeology and Historic Preservation*, BLM Handbook H-8110, and  
31 revised BLM Manual 8110; and applicable state-specific BLM or SHPO  
32 survey, site record, or reporting standards.
- 33
- 34 **CR2-5** If significant or National Register of Historic Places (NRHP)-eligible cultural  
35 resources are present at the site and would be adversely affected, or if areas  
36 with a high potential to contain additional cultural material have been  
37 identified, a formalized agreement will be required to address management  
38 and mitigation options in the form of various planning documents  
39 (e.g., Cultural Resources Management and Mitigation Plan (including  
40 specifications for data recovery), Historic Properties Treatment Plan, etc.).  
41 The agreement shall be developed in consultation with the SHPO,  
42 appropriate federally recognized Tribes, and any consulting parties. The  
43 agreement also shall identify measures to prevent potential looting/vandalism  
44 or erosion impacts and address the education of workers and the public to  
45 make them aware of the consequences of unauthorized collection of cultural  
46 resources on public land.

1 **CR2-6** To protect historic properties, sacred sites, and portions of historic trails that  
2 are potentially eligible for listing on the NRHP from visual intrusion and to  
3 maintain the integrity of the historic cultural setting, the BLM could require  
4 that surface disturbance be restricted or prohibited within the viewshed of a  
5 historic property, sacred site, or trail segment for which eligibility is tied to  
6 the visual setting. These types of adverse effects will be minimized, avoided,  
7 or mitigated through the Section 106 consultation process.  
8

9 **CR2-7** In cases where there is a probability of encountering cultural resources during  
10 construction that could not be fully detected during a Class III inventory,  
11 cultural field monitors (appropriate for the resource anticipated) shall be  
12 employed to monitor ground-disturbing activities. Development of a  
13 monitoring plan as part of the Cultural Resources Management and  
14 Mitigation Plan is recommended.  
15

#### 16 ***A.2.2.16.3 Reclamation and Decommissioning***

17

18  
19 **CR3-1** Any soil-disturbing reclamation and decommissioning activities will be  
20 confined to previously disturbed areas. Known historic properties will be  
21 avoided during these activities.  
22

23 **CR3-2** Any building or structure that will be demolished or substantially altered will  
24 be evaluated for its historic significance in consultation with the BLM and  
25 the SHPO. If structures are found to be eligible for listing on the NRHP they  
26 will be recorded to appropriate HABS/HAER standards before demolition or  
27 alteration.  
28

29 **CR3-3** Prior to reclamation activities, BLM may require an update to the Cultural  
30 Resources Management and Mitigation Plan addressing reclamation  
31 activities.  
32

#### 33 ***A.2.2.17 Design Features for Native American Concerns***

34

35  
36 The following design features were identified to avoid, reduce, and/or mitigate potential  
37 impacts in areas of Native American Concern from solar development identified and discussed in  
38 Sections 5.16.1 and 5.16.2 of the Draft and Final Solar PEIS.  
39

#### 40 ***A.2.2.17.1 General***

41

42  
43 **NA1-1** The BLM shall consult with Native American governments early in the  
44 planning process to identify issues and areas of concern regarding any  
45 proposed solar energy project. Such consultation is required by the NHPA  
46 and other authorities and is necessary to determine whether construction and

1 operation of the project are likely to disturb Tribally sensitive resources,  
2 impede access to culturally important locations, disrupt traditional cultural  
3 practices, affect movements of animals important to Tribes, or visually affect  
4 culturally important landscapes. It may be possible to negotiate a mutually  
5 acceptable means of minimizing adverse effects to resources important to  
6 Tribes. The process shall be documented in a Native American Consultation  
7 Plan that would address consultation during both planning and construction,  
8 and also any necessary monitoring/education during operations and  
9 decommissioning.

10  
11 **NA1-2** The significance of any Native American archaeological or other culturally  
12 important sites identified in archaeological inventories in project areas shall  
13 be determined and validated through consultation with appropriate Native  
14 American governments and cultural authorities. Appropriate mitigation steps,  
15 such as avoidance, removal, repatriation of Native American human remains  
16 and associated items of cultural patrimony, or curation, shall be determined  
17 during this consultation.

18  
19 **NA1-3** Visual intrusion on sacred areas shall be avoided to the extent practical  
20 through the selection of the solar facility location and solar technology.  
21 When avoidance is not possible, timely and meaningful consultation with the  
22 affected Tribe(s) shall be conducted to formulate a mutually acceptable plan  
23 to mitigate or reduce the adverse effect.

24  
25 **NA1-4** Tribal burial sites shall be avoided. An Unanticipated Burial Contingency  
26 Plan for encountering unanticipated burials and funerary goods during  
27 construction, maintenance, or operation of a solar facility shall be developed  
28 as part of a formalized agreement to address management and mitigation  
29 options for significant cultural resources in consultation with the appropriate  
30 Tribal governments and cultural authorities well in advance of any ground  
31 disturbances. The contingency plan shall include consultation with the lineal  
32 descendants or Tribal affiliates of the deceased, and human remains and  
33 objects of cultural patrimony shall be protected and repatriated according to  
34 NAGPRA statutory procedures and regulations.

35  
36 **NA1-5** Springs and other water sources that are or may be sacred or culturally  
37 important shall be avoided whenever possible. If it is necessary for  
38 construction, maintenance, or operational activities to take place in proximity  
39 to springs or other water sources, appropriate measures, such as the use of  
40 geotextiles or silt fencing, shall be taken to prevent silt from degrading water  
41 sources. The effectiveness of these mitigating barriers shall be monitored.  
42 Measures for preventing water depletion impacts on springs shall also be  
43 employed. Particular mitigations shall be determined in consultation with the  
44 appropriate Native American Tribe(s).

45

- 1 **NA1-6** Culturally important plant species shall be avoided when possible. When it is  
2 not possible to avoid these plant resources, consultations shall be undertaken  
3 with the affected Tribe(s). If the species is available elsewhere on agency-  
4 managed lands, guaranteeing access may suffice. For rare or less common  
5 species, establishing (transplanting) an equal amount of the plant resource  
6 elsewhere on agency-managed land accessible to the affected Tribe may be  
7 acceptable.  
8
- 9 **NA1-7** Culturally important wildlife species and their habitats shall be avoided.  
10 When it is not possible to avoid these habitats, solar facilities shall be  
11 designed to minimize impacts on game trails, migration routes, and nesting  
12 and breeding areas of Tribally important species. Mitigation and monitoring  
13 procedures shall be developed in consultation with the affected Tribe(s).  
14
- 15 **NA1-8** Archaeological sites created by ancestral Native American populations shall  
16 be avoided whenever possible. However, when archaeological excavations  
17 are necessary, affiliated Tribe(s) shall be consulted, and the concerns of the  
18 affected descendant Native American population shall be taken into account  
19 when developing a data recovery strategy. Possible mitigations include  
20 scientific excavation; monitoring or participation in excavations by Tribal  
21 representatives; and repatriation or approved curation of artifacts.  
22
- 23 **NA1-9** Rock art (panels of petroglyphs and/or pictographs) shall be avoided  
24 whenever possible. These panels may be just one component of a larger  
25 sacred landscape, in which avoidance of all impacts may not be possible.  
26 Mitigation plans for eliminating or reducing (minimizing) potential impacts  
27 on rock art shall be formulated in consultation with the appropriate Tribal  
28 cultural authorities.  
29
- 30 **NA1-10** Standard noise design features shall be employed when solar facilities would  
31 be located near sacred sites to minimize the impacts of noise on culturally  
32 significant areas.  
33
- 34 **NA1-11** Health and safety design features for the general public shall be employed  
35 when solar facilities are located near Native American traditional use areas in  
36 order to minimize potential health and safety impacts on Native Americans.  
37
- 38 **NA1-12** The BLM will require a Performance and Reclamation bond for all solar  
39 energy projects. This will ensure compliance with the terms and conditions of  
40 the ROW authorization. When establishing bond amounts and conditions, the  
41 BLM authorized officer will require coverage of all expenses tied to cultural  
42 resources identification, protection, and mitigation of effects. These may  
43 include, but are not limited to, costs for ethnographic studies, inventory,  
44 testing, geomorphological studies, data recovery, compensatory mitigation  
45 programs, curation, monitoring, treatment of damaged sites, and submission  
46 of reports (see ROW authorization policies, Section 2.2.2.1).



1                    ***A.2.2.17.2 Site Characterization, Siting, and Design Construction***

2  
3 **NA2-1**        Prior to construction, training shall be provided to contractor personnel  
4                    whose activities or responsibilities could affect resources of significance to  
5                    Native Americans during construction.  
6

7 **NA2-2**        When there is a reasonable expectation of encountering previously  
8                    unidentified cultural resources during construction, monitoring of  
9                    construction by a qualified cultural resource specialist shall be considered to  
10                    minimize impacts on resources of significance to Tribes to the extent  
11                    possible.  
12

13  
14                    ***A.2.2.17.3 Operations and Maintenance***

15  
16 **NA3-1**        Communication with affected federally recognized tribes will be maintained  
17                    during the life of the project.  
18

19 **NA3-2**        Facility personnel will be trained in their responsibilities to protect any  
20                    known tribally important resources.  
21

22  
23                    ***A.2.2.17.4 Reclamation and Decommissioning***

24  
25 **NA4-1**        Reclamation and decommissioning activities will be confined to previously  
26                    disturbed areas and existing access roads.  
27

28 **NA4-2**        To the extent practicable, reclamation activities will return the site to its pre-  
29                    construction condition.  
30

31  
32                    ***A.2.2.18 Design Features for Socioeconomic Impacts***

33  
34                    The following design features were identified to avoid, reduce, and/or mitigate potential  
35                    socioeconomic impacts from solar development identified and discussed in Sections 5.17.1 and  
36                    5.17.2 of the Draft and Final Solar PEIS.  
37

38  
39                    ***A.2.2.18.1 General***

40  
41 **S1-1**        To address impacts to local issues, the BLM may include stipulations in the  
42                    ROW authorization or require solar developers to enter into mitigation  
43                    agreements with individual local jurisdictions and county agencies, as  
44                    necessary.  
45

1 **S1-2** If the BLM authorized officer concludes that the project is likely to have a  
2 substantial impact on the economic or social conditions of local communities,  
3 the project developers shall work with state, local, and Tribal agencies and  
4 governments to develop community monitoring programs that would be  
5 sufficient to identify and evaluate socioeconomic impacts resulting from  
6 solar energy development. Monitoring programs shall collect data reflecting  
7 the economic, fiscal, and social impacts of development at the state, local,  
8 and Tribal level. Parameters to be evaluated could include impacts on local  
9 labor and housing markets, local consumer product prices and availability,  
10 local public services (police, fire, and public health), and educational  
11 services. Programs also could monitor indicators of social disruption  
12 (e.g., crime, alcoholism, drug use, and mental health) and the effectiveness of  
13 community welfare programs in addressing these problems.  
14

15 **S1-3** If the BLM authorized officer concludes that the project is likely to have a  
16 substantial impact on the economic or social conditions of local communities,  
17 the BLM may include stipulations in the ROW authorization or require solar  
18 developers to enter into mitigation agreements with individual local  
19 jurisdictions and county agencies, as necessary, to address local issues. Also,  
20 project developers shall work with state, local, and Tribal agencies to develop  
21 community outreach programs that would help communities adjust to  
22 changes triggered by solar energy development. Such programs could include  
23 any of the following activities:  
24

- 25 – Establishing vocational training programs for the local workforce to  
26 promote development of skills required by the solar energy industry.
- 27
- 28 – Developing instructional materials for use in area schools to educate the  
29 local communities on the solar energy industry.
- 30
- 31 – Supporting community health screenings.
- 32
- 33 – Providing financial support to local libraries for the development of  
34 information repositories on solar energy, including materials on the  
35 hazards and benefits of commercial development. Electronic repositories  
36 established by the operators could also be of great value.
- 37
- 38

#### 39 ***A.2.2.18.2 Site Characterization, Siting, and Design Construction***

40  
41 **S2-1** Project developers shall collect and evaluate available information describing  
42 the socioeconomic conditions in the vicinity of the proposed project, as  
43 needed, to predict potential impacts of the project.  
44  
45

1           **A.2.2.19 Design Features for Environmental Justice Impacts**  
2

3           The following design features were identified to avoid, reduce, and/or mitigate potential  
4 environmental justice impacts from solar development identified and discussed in  
5 Sections 5.18.1 and 5.18.2 of the Draft and Final Solar PEIS.  
6

7  
8           **A.2.2.19.1 General**  
9

- 10 **EJ1-1**       For projects that might cause environmental justice impacts, an  
11 Environmental Justice Plan shall be developed to mitigate the potential  
12 environmental, economic, cultural, and health impacts on low-income and  
13 minority populations.  
14
- 15 **EJ1-2**       Focused public information campaigns shall be developed and implemented  
16 where applicable to provide technical and environmental health information  
17 directly to low-income and minority groups or to local agencies and  
18 representative groups. Key information would include the extent of any likely  
19 impact on air quality, drinking water supplies, subsistence resources, public  
20 services, and the relevant preventative measures that may be taken.  
21
- 22 **EJ1-3**       Community health screenings shall be provided for low-income and minority  
23 groups where applicable.  
24
- 25 **EJ1-4**       Financial support to local libraries in low-income and minority communities  
26 shall be provided for the development of information repositories on solar  
27 energy, including materials on the hazards and benefits of commercial  
28 development.  
29
- 30 **EJ1-5**       Vocational training programs for the local low-income and minority  
31 workforce shall be established to promote development of skills required by  
32 the solar energy industry.  
33
- 34 **EJ1-6**       Instructional materials shall be developed for use in area schools to educate  
35 the local communities on the solar energy industry.  
36
- 37 **EJ1-7**       Key information shall be provided to local governments and directly to low-  
38 income and minority populations on the scale and timeline of expected solar  
39 projects and on the experience of other low-income and minority  
40 communities that have followed the same energy development path. In  
41 addition, information on planning activities that may be initiated to provide  
42 local infrastructure, public services, education, and housing could be made  
43 available.  
44  
45

1           **A.2.2.20 Design Features for Transportation Impacts**  
2

3           The following design features were identified to avoid, reduce, and/or mitigate potential  
4 transportation impacts from solar development identified and discussed in Sections 5.19.1 and  
5 5.19.2 of the Draft and Final Solar PEIS.  
6

7  
8           **A.2.2.20.1 General**  
9

10 **T1-1**       Incorporation of site access into the local and regional road network must be  
11 done under the supervision of local, county, state, and federal agencies with  
12 jurisdiction over relevant matters such as road maintenance and repair, road  
13 improvements, requirements for and construction of new roads if necessary,  
14 and traffic management. Dependent on the agencies with jurisdiction and the  
15 actual site location and existing roads and traffic patterns, approval of any  
16 site access proposal could require traffic studies, analyses of existing and  
17 proposed new roads to physically handle the added wear and tear from  
18 increased construction commuter and truck traffic, and possibly other  
19 environmental studies.  
20

21  
22           **A.2.2.20.2 Site Characterization, Siting, and Design Construction**  
23

24 **T2-1**       Easements could be required for public roadway corridors through a site to  
25 maintain proper traffic flows and retain more direct routing for the local  
26 population.  
27

28 **T2-2**       To mitigate impacts related to the daily commutes of construction workers,  
29 the operator may be required to implement local road improvements, provide  
30 multiple site access locations and routes, stagger work schedules, and  
31 implement a ride-sharing or shuttle program.  
32

33 **T2-3**       To reduce hazards for incoming and outgoing traffic, as well as to expedite  
34 traffic flow, the operator may be required to implement traffic control  
35 measures, such as intersection realignment coupled with speed limit  
36 reduction; the installation of traffic lights and/or other signage; and the  
37 addition of acceleration, deceleration, and turn lanes on routes with site  
38 entrances.  
39

40  
41           **A.2.2.21 Design Features for Hazardous Materials and Waste**  
42

43           The following design features were identified to avoid, reduce, and/or mitigate potential  
44 hazardous materials and waste impacts from solar development identified and discussed in  
45 Sections 5.20.1 and 5.20.2 of the Draft and Final Solar PEIS.  
46

1                    **A.2.2.21.1 General**  
2

3 **HMW1-1** A Hazardous Materials and Waste Management Plan shall address the  
4 selection, transport, storage, and use of all hazardous materials needed for  
5 construction, operation, and decommissioning of the facility for local  
6 emergency response and public safety authorities and for the designated  
7 BLM land manager, and it shall address the characterization, on-site storage,  
8 recycling, and disposal of all resulting wastes.<sup>5</sup> The plan shall, at a minimum,  
9 include the following: facility identification; comprehensive hazardous  
10 materials inventory; Material Safety Data Sheets (MSDSs) for each type of  
11 hazardous material; emergency contacts and mutual aid agreements, if any;  
12 site map showing all hazardous materials and waste storage and use  
13 locations; copies of spill and emergency response plans (see below), and  
14 hazardous materials-related elements of a decommissioning/closure plan.  
15

16 **HMW1-2** A Construction and Operation Waste Management Plan shall identify the  
17 waste streams that are expected to be generated at the site and address  
18 hazardous waste determination procedures, waste storage locations, waste-  
19 specific management and disposal requirements, inspection procedures, and  
20 waste minimization procedures. The plan shall address all solid and liquid  
21 wastes that may be generated at the site in compliance with the CWA  
22 requirements to obtain the project's NPDES permit.  
23

24 **HMW1-3** A Fire Management and Protection Plan shall be developed to implement  
25 measures to minimize the potential for fires associated with substances used  
26 and stored at the site. The flammability of the specific HTF used at the  
27 facility shall be considered.  
28

29 **HMW1-4** If pesticides/herbicides are to be used on the site, a Nuisance Animal and  
30 Pest Control Plan and an Integrated Vegetation Management Plan shall be  
31 developed to ensure that applications will be conducted within the  
32 framework of BLM policies and will entail the use of only EPA-registered  
33 pesticides/herbicides that are nonpersistent and immobile and approved by  
34 the BLM land manager.  
35

36 **HMW1-5** A comprehensive Spill Prevention and Emergency Response Plan shall be  
37 developed for the facility, and it shall meet the following criteria. It will be  
38 written, periodically updated, and made available to the entire workforce;  
39 contain procedures for timely notification of appropriate authorities,  
40 including the designated BLM land manager; provide spill/emergency  
41 contingency planning for each type of hazardous material present, including  
42 the abatement or stabilizing of the release, recovery of the spilled product,  
43 and remediation of the impacted environmental media; be supported by the

---

<sup>5</sup> It is not anticipated that any solar energy facility would have hazardous chemicals present on-site in such quantities as to require development of a Risk Management Plan as specified in 40 CFR Part 68.

1 strategic deployment of appropriate spill response materials and equipment,  
2 including personal protective equipment (PPE) for individuals with spill or  
3 emergency response assignments; provide for prompt response to spills and  
4 timely delivery of recovered spill materials and contaminated environmental  
5 media to appropriately permitted off-site treatment or disposal facilities;  
6 formally assign spill and emergency response duties to specified individuals;  
7 provide general awareness training to remaining facility personnel; and  
8 provide for written documentation of each event, including root cause  
9 analysis, description of corrective actions taken, and characterization of the  
10 resulting environmental or health and safety impacts.

11  
12 **HM1-6** All site characterization, construction, operation, and decommissioning  
13 activities shall be conducted in compliance with applicable federal and state  
14 laws and regulations, including the Toxic Substances Control Act of 1976, as  
15 amended (15 USC 2601, et seq.). In addition, any release of toxic substances  
16 (leaks, spills, etc.) in excess of the reportable quantity established by  
17 40 CFR Part 117 shall be reported as required by the Comprehensive  
18 Environmental Response, Compensation, and Liability Act (CERCLA) of  
19 1980, Section 102b. A copy of any report required or requested by any  
20 federal agency or state government as a result of a reportable release or spill  
21 of any toxic substances shall be furnished to the authorized officer concurrent  
22 with the filing of the reports to the involved federal agency or state  
23 government. In addition, the United States shall be indemnified against any  
24 liability arising from the release of any hazardous substance or hazardous  
25 waste on the facility or associated with facility activities.

26  
27 **HMW1-7** Pollution prevention opportunities shall be identified and implemented,  
28 including material substitution of less hazardous alternatives, recycling, and  
29 waste minimization.

30  
31 **HMW1-8** Systems containing hazardous materials shall be designed and operated in a  
32 manner that limits the potential for their release; measures shall include  
33 construction of compatible materials in safe condition (as verified by periodic  
34 inspections); provision of secondary containment features (to the extent  
35 practical); installation of sensors or other devices to monitor system integrity;  
36 installation of strategically placed valves to isolate damaged portions and  
37 limit the amount of hazardous materials in jeopardy of release; and use of  
38 robust inspection and repair procedures.

39  
40 **HMW1-9** Dedicated areas with secondary containment shall be established for  
41 off-loading hazardous materials transport vehicles.

42  
43 **HMW1-10** To the greatest extent practical and by considering the remoteness of a given  
44 facility, “just-in-time” ordering procedures shall be employed that are  
45 designed to limit the amounts of hazardous materials present on the site to

1 quantities minimally necessary to support continued operations. Excess  
2 hazardous materials shall receive prompt disposition.

3  
4 **HMW1-11** Written procedures for the storage, use, and transportation of each type of  
5 hazardous material present shall be provided, including all vehicle and  
6 equipment fuels.

7  
8 **HMW1-12** Authorized users for each type of hazardous material shall be identified.

9  
10 **HMW1-13** Procedures shall be established for fuel storage and dispensing, including  
11 shutting off vehicle (equipment) engines; using only authorized hoses,  
12 pumps, and other equipment in working order; maintaining appropriate fire  
13 and spill response materials at equipment fueling stations; providing  
14 emergency shutoffs for fuel pumps; ensuring that fueling stations are paved;  
15 ensuring that both aboveground fuel tanks and fueling both have adequate  
16 secondary containment; prohibiting smoking, welding, or open flames in fuel  
17 storage and dispensing areas; equipping the area with fire suppression  
18 devices, as appropriate; conducting routine inspections of fuel storage and  
19 dispensing areas; requiring prompt recovery and remediation of all spills; and  
20 providing for the prompt removal of all fuel and fuel tanks used to support  
21 construction vehicles and equipment at the completion of facility  
22 construction and decommissioning phases.

23  
24 **HMW1-14** All vehicles and equipment shall be in proper working condition to ensure  
25 that there is no potential for leaks of motor oil, antifreeze, hydraulic fluid,  
26 grease, or other hazardous materials.

27  
28 **HMW1-15** Written procedures shall be established for inspecting hazardous materials  
29 and waste storage areas and for plant systems containing hazardous  
30 materials; identified deficiencies and their resolution shall be documented.

31  
32 **HMW1-16** Schedules shall be established for the regular removal of wastes (including  
33 sanitary wastewater generated in temporary, portable sanitary facilities) for  
34 delivery by licensed haulers to appropriate off-site treatment or disposal  
35 facilities.

36  
37  
38 ***A.2.2.21.2 Site Characterization, Siting, and Design Construction***

39  
40 **HMW2-1** Project developers shall survey project sites for unexploded ordnance,  
41 especially if projects are within 20 mi (32 km) of a current DoD installation  
42 or formally used defense site.

43  
44 **HMW2-2** Refueling areas shall be located away from surface water locations and  
45 drainages and on paved surfaces; features shall be added to direct spilled

1 materials to sumps or safe storage areas where they can be subsequently  
2 recovered.

3  
4 **HMW2-3** Hazardous materials and waste storage areas or facilities shall be formally  
5 designated and access to them restricted to authorized personnel.  
6 Construction debris, especially treated wood, shall not be disposed of or  
7 stored in areas where it could come in contact with aquatic habitats.

8  
9 **HMW2-4** Design requirements shall be established for hazardous materials and waste  
10 storage areas that are consistent with accepted industry practices as well as  
11 applicable federal, state, and local regulations and that include, at a  
12 minimum, (1) containers constructed of compatible materials, properly  
13 labeled, and in good condition; (2) secondary containment features for liquid  
14 hazardous materials and wastes; (3) physical separation of incompatible  
15 chemicals; and (4) fire-fighting capabilities when warranted.

16  
17  
18 ***A.2.2.21.3 Operations and Maintenance***

19  
20 **HMW3-1** Hazardous materials and waste storage areas or facilities shall be formally  
21 designated and access to them restricted to authorized personnel.

22  
23  
24 ***A.2.2.21.4 Reclamation and Decommissioning***

25  
26 **HMW4-1** During facility decommissioning, the following shall occur: Emergency  
27 response capabilities shall be maintained throughout the decommissioning  
28 period as long as hazardous materials and wastes remain on-site, and  
29 emergency response planning shall be extended to any temporary material  
30 and equipment storage areas that may have been established. Temporary  
31 waste storage areas shall be properly designated, designed, and equipped.  
32 Hazardous materials removed from systems shall be properly containerized  
33 and characterized, and recycling options shall be identified and pursued.  
34 Off-site transportation of recovered hazardous materials and wastes resulting  
35 from decommissioning activities shall be conducted by authorized carriers.  
36 All hazardous materials and waste shall be removed from on-site storage and  
37 management areas (including surface impoundments), and the areas shall be  
38 surveyed for contamination and remediated as necessary.

39  
40  
41 ***A.2.2.22 Design Features to Ensure Health and Safety***

42  
43 The following design features were identified to avoid, reduce, and/or mitigate potential  
44 health and safety impacts from solar development identified and discussed in Sections 5.21.1 and  
45 5.22.2 of the Draft and Final Solar PEIS.



1            **A.2.2.22.1 General**

2  
3    **HS1-1**     All site characterization, construction, operation, and decommissioning  
4                activities shall be conducted in compliance with applicable federal and state  
5                occupational safety and health standards (e.g., the Occupational Health and  
6                Safety Administration’s [OSHA’s] Occupational Health and Safety  
7                Standards, 29 CFR Parts 1910 and 1926, respectively).

8  
9    **HS1-2**     A safety assessment shall be conducted to describe potential safety issues and  
10                the means that would be taken to mitigate them, covering issues such as site  
11                access; construction; safe work practices; glare exposure from mirrors,  
12                heliostats, and/or power towers; security; heavy equipment transportation;  
13                traffic management; emergency procedures; and fire control.

14  
15   **HS1-3**     A health and safety program shall be developed to protect workers during site  
16                characterization, construction, operation, and decommissioning of a solar  
17                energy project. The program shall identify all applicable federal and state  
18                occupational safety standards and establish safe work practices addressing all  
19                hazards, including requirements for developing the following plans: general  
20                injury prevention; PPE requirements and training; respiratory protection;  
21                hearing conservation; electrical safety; hazardous materials safety and  
22                communication; housekeeping and material handling; confined space entry;  
23                hand and portable power tool use; gas-filled equipment use; and rescue  
24                response and emergency medical support, including on-site first aid  
25                capability.

26  
27   **HS1-4**     In addition, the health and safety program shall address OSHA standard  
28                practices for the safe use of explosives and blasting agents (e.g., if used to  
29                construct foundations for power tower facilities); measures for reducing  
30                occupational electric and magnetic field (EMF) exposures; the establishment  
31                of fire safety evacuation procedures; and required safety performance  
32                standards (e.g., electrical system standards and lighting protection standards).  
33                The program shall include training requirements for applicable tasks for  
34                workers and establish procedures for providing required training to all  
35                workers. Documentation of training and a mechanism for reporting serious  
36                accidents to appropriate agencies shall be established.

37  
38   **HS1-5**     A health risk assessment shall evaluate potential cancer and noncancer risks  
39                to workers from exposure to facility emission sources during construction  
40                and operations. If potential risks are found to exceed applicable threshold  
41                levels, measures shall be taken to decrease emissions from the source.

42  
43   **HS1-6**     In the event of an accidental release of hazardous substances to the  
44                environment, project developers shall document the event, including a root  
45                cause analysis, a description of appropriate corrective actions taken, and a  
46                characterization of the resulting environmental or health and safety impacts.

1 Documentation of the event shall be provided to the permitting agencies and  
2 other federal and state agencies within 30 days, as required.  
3

4 **HS1-7** The project health and safety program shall address protection of public  
5 health and safety during site characterization, construction, operation, and  
6 decommissioning for a solar energy project. The program shall establish a  
7 safety zone or setback for solar facilities and associated transmission lines  
8 from residences and occupied buildings, roads, ROWs, and other public  
9 access areas that is sufficient to prevent accidents resulting from various  
10 hazards during all phases of development. It shall identify requirements for  
11 temporary fencing around staging areas, storage yards, and excavations  
12 during construction or decommissioning activities. It shall also identify  
13 measures to be taken during the operations phase to limit public access to  
14 facilities (e.g., equipment with access doors shall be locked to limit public  
15 access, and permanent fencing with slats shall be installed around electrical  
16 substations).  
17

18 **HS1-8** A Traffic Management Plan shall be prepared for the site access roads to  
19 control hazards that could result from increased truck traffic (most likely  
20 during construction or decommissioning), to ensure that traffic flow would  
21 not be adversely affected and that specific issues of concern (e.g., the  
22 locations of school bus routes and stops) are identified and addressed. This  
23 plan shall incorporate measures, such as informational signs, flaggers (when  
24 equipment may result in blocked throughways), and traffic cones to identify  
25 any necessary changes in temporary lane configurations. The plan shall be  
26 developed in coordination with local planning authorities.  
27

28 **HS1-9** Solar facilities shall be sited and designed properly to eliminate glint and  
29 glare effects on roadway users, nearby residences, commercial areas, or other  
30 highly sensitive viewing locations or to reduce it to the lowest achievable  
31 levels (see similar design feature under Section A.2.2.13). Regardless of the  
32 solar technology proposed, a Glint and Glare Assessment, Mitigation, and  
33 Monitoring Plan must accurately assess and quantify potential glint and glare  
34 effects and determine potential health, safety, and visual impacts associated  
35 with glint and glare effects. The assessment shall be conducted by qualified  
36 individuals using appropriate and commonly accepted software and  
37 procedures. The assessment results must be made available to BLM in  
38 advance of project approval. If the project design is changed during the siting  
39 and design process such that substantial changes to glint and glare effects  
40 may occur, glint and glare effects shall be recalculated, and the results shall  
41 be made available to BLM. If any potential for exposure at levels that could  
42 cause retinal damage is identified, measures to eliminate the exposure shall  
43 be implemented (e.g., slatted fencing to shield views from outside the  
44 facility). The Plan shall also set up a system for logging, investigating, and  
45 responding to complaints regarding glare.  
46

- 1 **HS1-10** A health risk assessment shall evaluate potential cancer and noncancer risks  
2 to the general public from exposure to facility emission sources during  
3 construction and operations. If potential risks are found to exceed applicable  
4 threshold levels, measures shall be taken to decrease emissions from the  
5 source.  
6
- 7 **HS1-11** Proper signage and/or engineered barriers (e.g., fencing) shall be used to  
8 limit access to electrically energized equipment and conductors in order to  
9 prevent access to electrical hazards by unauthorized individuals or wildlife.  
10
- 11 **HS1-12** Operators shall develop a Fire Management and Protection Plan to  
12 implement measures to minimize the potential for a human-caused fire and to  
13 respond to human-caused or natural-caused fires.  
14
- 15 **HS1-13** Project developers shall work with appropriate agencies (e.g., the  
16 U.S. Department of Energy [DOE] and Transportation Security  
17 Administration [TSA]) to address critical infrastructure and key resource  
18 vulnerabilities at solar facilities in order to minimize and plan for potential  
19 risks from natural events, sabotage, and terrorism.  
20

21  
22 **A.2.2.22.2 Site Characterization, Siting, and Design Construction**  
23

- 24 **HS2-1** Electrical systems shall be designed to meet all applicable safety standards  
25 (e.g., National Electrical Code [NEC]) and comply with the interconnection  
26 requirements of the transmission system operator.  
27
- 28 **HS2-2** For the mitigation of explosive hazards, workers shall be required to comply  
29 with the OSHA standard (29 CFR 1910.109) for the safe use of explosives  
30 and blasting agents.  
31
- 32 **HS2-3** Because of the high global warming potential of sulfur hexafluoride (SF<sub>6</sub>),  
33 the use of alternative dielectric fluids that do not have a high global warming  
34 potential shall be required.  
35
- 36 **HS2-4** If operation of the solar facility and associated transmission lines and  
37 substations is expected to cause potential adverse impacts on nearby  
38 residences and occupied buildings from noise, sun reflection, or EMF,  
39 recommendations for addressing these concerns shall be incorporated into the  
40 project design (e.g., establishing a sufficient setback from transmission lines).  
41
- 42 **HS2-5** The project shall be planned to comply with FAA regulations, including  
43 lighting requirements, and to avoid potential safety issues associated with  
44 proximity to airports, military bases or training areas, or landing strips.  
45  
46

1           **A.2.2.22.3 Operations and Maintenance**

2  
3   **HS3-1**       Measures shall be considered to reduce occupational EMF exposures, such  
4                   as backing electrical generators with iron to block the EMF, shutting down  
5                   generators when work is being done near them, and otherwise limiting  
6                   exposure time and proximity while generators are running.

7  
8  
9           **A.2.2.23 Reference**

10  
11   USFWS (U.S. Fish and Wildlife Service), 2008, *Finding of No Significant Impact,*  
12   *Implementation of a Desert Tortoise Recovery Plan Task: Reduce Common Raven Predation on*  
13   *the Desert Tortoise*, March 14. Available at [http://www.dmg.gov/documents/FONSI\\_Reduce\\_](http://www.dmg.gov/documents/FONSI_Reduce_)  
14   [Common\\_Raven\\_Pred\\_on\\_the\\_DT\\_USFWS\\_040208.pdf](http://www.dmg.gov/documents/FONSI_Reduce_Common_Raven_Pred_on_the_DT_USFWS_040208.pdf). Accessed March 27, 2012.