

BLM Solar Energy Program Design Features

Programmatic Design Features for Water Resources

The following design features have been identified to avoid, minimize, and/or mitigate potential impacts on water resources from solar energy development identified and discussed in Sections 5.9.1 and 5.9.2 of the Draft and Final Solar PEIS.

General

The following activities will be undertaken to minimize impacts on water resources. They are to be done in coordination with the appropriate local, state, and Federal regulating agencies.

WR1-1 The project developer shall control project site drainage, erosion, and sedimentation related to stormwater runoff. The project developer shall identify site surface water runoff patterns and develop measures that prevent adverse impacts associated with project related soil deposition and erosion throughout and downslope of the project site and project-related construction areas. This shall be implemented within a Stormwater Pollution Prevention Plan and incorporated into the POD, as appropriate.

- (a) Assessing stormwater runoff concerns shall include, but is not limited to, the following:
- Conducting hydrologic analysis and modeling to define the 100-year, 24-hour rainfall for the project area and calculating projected runoff from this storm at the site.
 - Demonstrating the project will not increase off-site flooding potential, and including provisions for stormwater and sediment retention on the project site.
 - Demonstrating compliance with construction stormwater permitting through the EPA or state-run NPDES program (whichever applies within the state).
 - Demonstrating compliance with the EPA requirement that any development larger than 20 acres (0.08 km²) and begun after August 2011 must monitor construction discharges for turbidity concentrations.
- (b) Methods to minimize stormwater runoff concerns may include, but are not limited to, the following:
- Managing runoff from parking lots, roofs, or other impervious surfaces.

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- Creating or improving landscaping used for stormwater treatment to capture runoff.
- Considering reduction of impervious surfaces through the use of permeable pavement or other pervious surfaces.
- Maintaining natural drainages and pre-project hydrographs for the project ROW to the extent practicable.
- Maintaining pre-development flood hydrograph for all storms up to and including the 100-year rainfall event.
- Incorporating environmental inspection and monitoring measures into the POD and other applicable plans to monitor and respond to impacts from stormwater runoff during construction, operations, and decommissioning of a solar energy development, including adaptive management protocols.

WR1-2 Project developers shall conduct hydrologic study (or studies) that demonstrate a clear understanding of the local surface water and groundwater hydrology.

- (a) Assessing surface water and groundwater hydrology may include, but is not limited to, the following:
- Determining the relationship of the project site hydrologic basin to the basins in the region.
 - Identifying surface water bodies within the watershed of SEZs or individual projects (including rivers, streams, ephemeral washes/drainages, lakes, wetlands, playas, and floodplains) and identifying the 100-year floodplain of any surface water feature on the site.
 - Identifying applicable groundwater aquifers.
 - Quantifying physical characteristics of surface water features, such as streamflow rates, stream cross sections, channel routings, seasonal flow rates.
 - Quantifying physical characteristics of the groundwater aquifer, such as physical dimensions of the aquifer, sediment characteristics, confined/unconfined conditions, hydraulic conductivity, and transmissivity distribution of the aquifer.

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- Quantifying the regional climate, including seasonal and long-term information on temperatures, precipitation, evaporation, and evapotranspiration.
- Quantifying the sustainable yield of surface waters and groundwater available to the project.
- Consulting with the U.S. Army Corps of Engineers (USACE) regarding the siting of solar energy generating facilities in relation to hydrological features that have the potential to be subject to USACE jurisdiction.

WR1-3 Project developers shall coordinate with the BLM and other Federal, state, and local agencies early in the planning process in order to identify water use for the solar energy project, and to secure a reliable and legally available water supply to meet project water needs.

(a) Assessing water use shall include, but is not limited to, the following:

- Quantifying water use requirements for project construction, operations, and decommissioning.
- Meeting potable water supply standards of Federal, state, and local water quality authorities (e.g., Sections 303 and 304 of the Clean Water Act [CWA]).
- Identifying wastewater treatment measures and new or expanded facilities, if any, to be included as part of the facility's National Pollutant Discharge Elimination System (NPDES) permit.

(b) Methods for minimizing water use may include, but are not limited to, the following:

- Utilizing appropriate water sources with respect to management practices for maintaining aquatic, riparian, and other water-dependent resources.
- Considering water conservation measures related to solar energy technology water needs to reduce project water requirements (i.e., use dry cooling, use recycled or impaired water).
- Incorporating environmental inspection and monitoring measures into the POD and other applicable plans to monitor water use during construction, operations, and decommissioning of the

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solar energy development, including adaptive management protocols.

- WR1-4** Project developers shall avoid and/or minimize impacts on existing surface water features, including streams, lakes, wetlands, floodplains, intermittent/ephemeral streams, and playas (any unavoidable impacts would be minimized or mitigated) and in nearby regions resulting from the development in accordance with the following:
- All sections of the CWA, including Sections 401, 402, and 404, addressing licensing and permitting issues;
 - Executive Orders (E.O.s) 11988 and 11990 of May 24, 1977, regarding floodplain and wetland management: E.O. 11988, “Floodplain Management” (*Federal Register*, Volume 42, page 26951 [42 FR 26951]), and E.O. 11990, “Protection of Wetlands” (42 FR 26961);
 - EPA stormwater management guidelines and applicable state and local guidelines;
 - Include submittal of a jurisdictional delineation for consultation with the USACE, in accordance with the 1987 wetlands delineation manual and appropriate regional supplement; avoidance, minimization and compensation proposals;
 - USACE permit, Nationwide verification, or other approved jurisdiction. This includes identification of a Least Environmentally Damaging Practicable Alternative (LEDPA) within the environmental analysis. The USACE permit, Nationwide verification, or approved jurisdiction letter shall be provided to the BLM prior to a decision;
 - National Wild and Scenic Rivers System (Public Law 90-542; 16 *United States Code* [U.S.C.] 1271 et seq.); and
 - Required CWA Section 303(d) identification of impaired surface water bodies.

Site Characterization, Siting and Design, Construction

- WR2-1** Project developers shall avoid, minimize, and mitigate impacts on groundwater and surface water resources in accordance with the laws and policies above.

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- (a) Methods to minimize impacts on surface water and groundwater resources may include, but are not limited to, the following:
- Reclaiming disturbed soils as quickly as possible.
 - Preventing the release of project waste materials into stormwater discharges.
 - Avoiding impacts on sole source aquifers according to EPA guidelines.
 - Developing measures to prevent potential groundwater and surface water contamination and incorporating them into the Spill Prevention and Emergency Response Plan and POD, as appropriate.
 - Minimizing land disturbance in ephemeral washes and dry lakebeds. Stormwater facilities shall be designed to route flow through or around the facility using existing washes when feasible, instead of concrete-lined channels.
 - Designing culverts and water conveyances to comply with BLM, state, and local standards, or to accommodate the runoff of a 100-year storm, whichever is larger.
 - Designing stormwater retention and/or infiltration and treatment systems for storm events up to and including the 100-year storm event.
 - Utilizing geotextile matting to stabilize disturbed channels and stream banks.
 - Diverting worksite runoff from entering disturbed streams using earth dikes, swales, and lined ditches.
 - Placing sediment control devices so that sediment-laden water can pond, thus allowing sediment to settle out.
 - Considering placement of check dams (i.e., small barriers constructed of rock, gravel bags, sandbags, fiber rolls, or reusable products) across a swale or drainage ditch to reduce the velocity of flowing water.
 - Considering special construction techniques in areas of erodible soil, alluvial fans, and stream channel/wash crossings.

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- Backfilling foundations and trenches with originally excavated material.
- Disposing of excess excavated material according to state and Federal laws.
- Maintaining drilling fluids or cuttings in a manner so as not to contact aquatic habitats. Temporary impoundments for storing drilling fluids and cuttings shall be lined to minimize the infiltration of runoff into groundwater or surface water.
- Avoiding washing equipment or vehicles in streams and wetlands.
- Constructing entry and exit pits in work areas to trap sediments from vehicles so they do not enter streams at stream crossings.
- Providing for periodic removal of wastewater generated in association with sanitary facilities by a licensed hauler.
- Avoiding the creation of hydrologic conduits between two aquifers.
- Using herbicides and pesticides within the framework of BLM and DOI policies and standard operating procedures, to include the use of only EPA-registered pesticides/herbicides that also comply with state and local regulations.
- Transporting, storing, managing, and disposing of hazardous materials and vehicle/equipment fuels in accordance with accepted best management practices (BMPs) and in compliance with all applicable regulations, and where applicable, the SWPPP.

Operations and Maintenance

WR3-1 Compliance with the terms and conditions for water resource mitigation shall be monitored by the project developer. The developer shall consult with the BLM through operations and maintenance of the project, employing an adaptive management strategy and modifications, as necessary and approved by the BLM.

- (a) Maintaining the water resource design elements during operations and maintenance of the project shall include, but not be limited to, the following:

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- Monitoring water quantity and quality in areas adjacent to or downstream from development areas through the life of the project to ensure that water flows and water quality are protected.
- Treating of sanitary and industrial wastewater either on-site or off-site to comply with Federal, state, and local regulations. Any discharges to surface waters would require NPDES permitting. Any storage or treatment of wastewater on-site must use proper lining of holding ponds and tanks to prevent leaks.
- Implementing monitoring using adaptive management strategies to ensure that long-term water use during operations does not substantially and disproportionately contribute to the long-term decline of groundwater levels or surface water flows and volumes, considering any mitigation measures that have been taken.

Reclamation and Decommissioning

WR4-1 Reclamation of the project site shall begin immediately after decommissioning to reduce the likelihood of water resource impacts from project activities. Developers shall coordinate with the BLM in advance of interim/final reclamation to have the BLM or other designated resource specialists on-site during reclamation to work on implementing water resource requirements and BMPs.

- (a) Methods for minimizing water resource impacts associated with reclamation and decommissioning activities may include, but are not limited to, the following:
- Restoring the project area to predevelopment water conditions or to the extent acceptable to the BLM.
 - Considering contouring of soil borrow areas, cut-and-fill slopes, berms, water bars, and other disturbed areas to approximate naturally occurring slopes.
 - Feathering edges of vegetation to reduce form and line contrasts with the existing landscapes.
 - Salvaging and reapplying topsoil from all decommissioning activities during final reclamation.

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- Continuing groundwater and surface water monitoring activities for a limited period of time, if appropriate given the specific situation.