

## **APPENDIX D**

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# **Design Features and Mitigation Measures**

To avoid and minimize Project impacts to the surrounding environment, the Applicant has incorporated programmatic design features that are set forth in the Solar PEIS ROD and Project-specific design features identified in the EA. In addition, the Applicant is required to comply with all Project-specific mitigation measures identified in the EA and with permit conditions and mitigation plans developed as required by permits and authorizations. To compensate for unavoidable impacts, the Applicant is required to pay the \$1,836 per acre fee identified in the Regional Mitigation Strategy for the Dry Lake Solar Energy Zone.

The following table includes design features and mitigation measures that will be implemented during Project construction, operation and decommissioning, presented as follows:

I. Dry Lake SEZ Programmatic Design Features (p. E-2)

II. EA Design Features (p. E-8)

III. Project Specific Mitigation Measures (p.E-9)

IV. BO Mitigation Measures (p. E-11)

Impact	Mitigation Measure
<b>I. Dry Lake SEZ Programmatic Design Features</b>	
Lands and Realty	<p>LR1-1: Project developers shall consult with the BLM in the early phases of project planning to identify potential land use conflicts and constraints</p> <p>LR2-1: Solar facilities shall be sited, designed, and constructed to avoid, minimize, and/or mitigate impacts on BLM land use planning designations.</p>
Specially Designated Areas and Lands with Wilderness Characteristics	<p>LWC1-1: Protection of existing values of specially designated areas and lands with wilderness characteristics shall be evaluated during the environmental analysis for solar energy projects, and the results shall be incorporated into the project planning and design.</p> <p>LWC2-1: Solar facilities shall be sited, designed, and constructed to avoid, minimize, and/or mitigate impacts on the values of specially designated areas and lands with wilderness characteristics.</p>
Wildland Fire	<p>WF1-1: Project developers shall coordinate with the BLM and other appropriate fire organizations early in the project planning process to determine fire risk and methods to minimize fire risk</p> <p>WF2-1: Solar facilities shall be sited and designed to minimize fire risk.</p>
Recreation	<p>R1-1: Project developers shall consult with the BLM in the early phases of project planning to identify public access and recreation use areas in and adjacent to a project site.</p> <p>R2-1: Solar facilities shall not be sited in areas designated as unique or important recreation resources (such as Special Recreation Management Areas), where it has been determined that a solar facility or other such development of the land would be in direct conflict with the objectives of the relevant management plan.</p>
Military and Civilian Aviation	<p>MCA1-1: Project developers shall coordinate with the BLM, military personnel, and civilian airspace managers early in the project planning process to identify and minimize impacts on military and civilian airport and airspace use.</p>
Soil Resources and Geologic Hazards	<p>SR1-1: Project developers shall coordinate with the BLM and other Federal, state, and local agencies early in the project planning process to assess soil erosion and geologic hazard concerns and to minimize potential impacts.</p> <p>SR2-1: Solar facilities shall be sited, designed, and constructed to minimize soil erosion and geologic hazard concerns.</p> <p>SR3-1: Compliance with the conditions for soil resources and geologic hazards shall be monitored by the project developer. Consultation with the BLM shall be maintained through the operations and maintenance of the project, employing an adaptive management strategy and modifications, as necessary and approved by the BLM.</p> <p>SR3-2: Permanent stabilization of disturbed areas shall occur during final grading and landscaping of the site and be maintained through the life of the facility.</p> <p>SR4-1: All design features for soil erosion and geologic hazards developed for the construction phase shall be applied to similar activities undertaken during the decommissioning and reclamation phase.</p>

Impact	Mitigation Measure
<b>I. Dry Lake SEZ Programmatic Design Features (cont.)</b>	
Soil Resources and Geologic Hazards (cont.)	<p>SR4-2: To the extent possible, the original grade and drainage pattern shall be re-established.</p> <p>SR4-3: Native plant communities in disturbed areas shall be restored by natural revegetation or by seeding and transplanting (using weed-free native grasses, forbs, and shrubs), on the basis of recommendations by the BLM, once decommissioning is completed.</p>
Mineral Resources	<p>MR1-1: Project developers shall consult with the BLM in the early phases of project planning to identify potential impacts on mineral development activities and ways to minimize potential adverse impacts.</p> <p>MR1-2: All solar energy development ROWs shall contain the stipulation that the BLM retains the right to issue oil and gas or geothermal leases with a stipulation of no surface occupancy within the ROW area. Upon designation, SEZs will be classified as no surface occupancy areas for oil and gas and geothermal leasing.</p> <p>MR2-1: Solar energy development projects shall be located to minimize conflicts with valid existing mineral rights and/or ongoing mineral development.</p>
Water Resources	<p>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.</p> <p>WR1-2: Project developers shall conduct hydrologic study (or studies) that demonstrate a clear understanding of the local surface water and groundwater hydrology.</p> <p>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.</p> <p>WR1-4: Project developers shall avoid and/or minimize impacts on existing surface water features, and any unavoidable impacts would be minimized or mitigated, in accordance with all applicable local, state and federal regulations.</p> <p>WR2-1: Project developers shall avoid, minimize, and mitigate impacts on groundwater and surface water resources in accordance with the laws and policies listed in WR1-4.</p> <p>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.</p> <p>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.</p>

Impact	Mitigation Measure
<b>I. Dry Lake SEZ Programmatic Design Features (cont.)</b>	
Ecological Resources	<p>ER1-1: Project developers shall consult with the BLM and other Federal, state, and local agencies in the early phases of project planning to help ensure compliance with Federal regulations that address the protection of fish, wildlife, and plant resources, with appropriate Federal, state, and local agencies.</p> <p>ER2-1: Solar facilities shall be sited and designed, and constructed to avoid, minimize, or mitigate impacts on ecological resources.ER3-1:</p> <p>ER3-1: The developer shall manage vegetation utilizing the principles of integrated pest management, including biological controls to prevent the spread of invasive species, per the Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States, and the National Invasive Species Management Plan, 2009. Consultation with the BLM shall be maintained through operations and maintenance of the project, employing an adaptive management strategy and modifications, as necessary and approved by the BLM.</p> <p>ER3-2: The developer shall, in consultation with the BLM and appropriate Federal, state, and local agencies, manage projects so as to minimize impacts on ecological resources during operations and maintenance of the project, employing an adaptive management strategy and modifications, as necessary and approved by the BLM.</p> <p>ER4-1: Reclamation of the construction and project site shall begin immediately after decommissioning to reduce the likelihood of ecological resource impacts in disturbed areas as quickly as possible.</p>
Air Quality and Climate	<p>AQC1-1: Project developers shall consult with the BLM in the early phases of project planning to help determine the potential conformance to air quality and other potential constraints.</p> <p>AQC2-1: Solar facilities shall be sited and designed, and constructed to minimize impacts on air quality.</p> <p>AQC3-1: Compliance with the terms and conditions for air quality shall be monitored by the project developer. Consultation with BLM shall be maintained through operations and maintenance of the project, employing an adaptive management strategy and modifications, as necessary and approved by the BLM.</p> <p>AQC4-1: Reclamation of the site shall incorporate the design features listed above for construction under AQC2-1 to reduce the likelihood of air quality impacts associated decommissioning.</p>
Visual Resources	<p>VR1-1: Project developers shall consult with the BLM in the early phases of project planning to help determine the proposed projects potential conformance to VRM class designations and other potential constraints, thus avoiding costly unforeseen planning implications and re-design.</p> <p>VR2-1: Solar facilities shall be sited and designed to minimize glint and glare.</p> <p>VR2-2: Solar facilities shall be sited and designed to minimize night-sky effects.</p> <p>VR2-3: The siting and design of solar facilities, structures, roads, and other project elements shall explore and document design considerations for reducing visual dominance in the viewshed and shall comply with the VRM class objectives in conformance with VR1-1.</p>

Impact	Mitigation Measure
<b>I. Dry Lake SEZ Programmatic Design Features (cont.)</b>	
Visual Resources (cont.)	<p>VR2-4: Project developer shall perform a pre-construction meeting with BLM or their designated visual/scenic resource specialists, such as a landscape architect, to coordinate the project construction VRM mitigation strategy. Final design and construction documents will be reviewed with regard to the visual mitigation elements, assuring that requirements and commitments are adequately addressed. The review of construction documents will include, but not be limited to, grading, drainage, revegetation, vegetation clearing, and feathering.</p> <p>VR3-1: Compliance with the terms and conditions for VRM mitigation shall be monitored by the project developer. Consultation with the BLM shall be maintained through operations and maintenance of the project, employing an adaptive management strategy and modifications, as necessary and approved by the BLM.</p> <p>VR4-1: Reclamation of the construction site shall begin immediately after construction to reduce the likelihood of visual contrasts associated with erosion and invasive weed infestation and to reduce the visibility of temporarily disturbed areas as quickly as possible. Developers shall coordinate with BLM in advance of interim/final reclamation to have BLM or other designated visual/scenic resource specialists, such as a landscape architect, on-site during reclamation to work on implementing visual resource requirements and BMPs.</p>
Acoustic Environment (Noise)	<p>N1-1: Project developers shall consult with the BLM in the early phases of project planning to assess and minimize the proposed project's noise impacts on sensitive noise receptors.</p> <p>N2-1: The siting and design of solar facilities, structures, roads, and other project elements shall seek to minimize impacts on sensitive noise receptors.</p> <p>N3-1: Compliance with the terms and conditions for noise shall be monitored by the project developer. Consultation with the BLM shall be maintained through operations and maintenance of the project, employing an adaptive management strategy and modifications as necessary and approved by the BLM.</p> <p>N4-1: Reclamation of the construction site shall minimize the project's noise impacts on sensitive noise receptors.</p>
Paleontological Resources	<p>P1-1: Project developers shall coordinate with the BLM early in the project planning process to identify and minimize impacts on paleontological resources.</p> <p>P2-1: Project developers shall use a qualified paleontological monitor during excavation and earthmoving activities in areas with high potential for paleontological resources.</p> <p>P2-2: Project developers shall notify the BLM immediately upon discovery of fossils. Work shall be halted at the fossil site and continued elsewhere until qualified personnel, such as a paleontologist, can visit the site, determine the significance of the find, and make site-specific recommendations for collection or other resource protection. The area of discovery shall be protected to ensure that fossils are not removed, handled, altered, or damaged until the site is properly evaluated and further action is determined.</p>

Impact	Mitigation Measure
<b>I. Dry Lake SEZ Programmatic Design Features (cont.)</b>	
Cultural Resources	<p>CR1-1: Project developers shall coordinate with the BLM early in the planning process to identify and minimize cultural resource impacts; the BLM will consult with other Federal, tribal, state, and local agencies as appropriate.</p> <p>CR2-1: Solar facilities shall be characterized, sited and designed, and Constructed in coordination with the BLM to minimize cultural resource impacts.</p> <p>CR3-1: Prior to reclamation activities, the BLM may require further planning for treatment of historic properties or planning for mitigation addressing reclamation activities.</p> <p>CR3-2: The BLM shall be notified prior to the demolition or substantial alteration of any building or structure. If judged necessary by the BLM, the developer will be required to evaluate the structures for their significance employing professionally qualified architects. If structures slated for demolition are found to be eligible for listing on the NRHP, they will be recorded to Historic American Building Survey and/or Historic American Engineering Record standards before alteration or removal.</p> <p>CR3-3: Project developers shall confine soil-disturbing reclamation and decommissioning activities to previously disturbed areas. Known historic properties will be avoided during these activities.</p>
Native American Resources	<p>NA1-1: The BLM shall consult with federally recognized Indian tribes early in the planning process to identify issues and areas of concern regarding any proposed solar energy project as required by the National Historic Preservation Act (NHPA) and other authorities to determine whether construction and operation of a project is likely to disturb traditional cultural properties or sacred sites, impede access to culturally important locations, disrupt traditional cultural practices, affect movements of animals important to tribes, or visually affect culturally important landscapes.</p> <p>NA2-1: Prior to construction, the project developer shall provide training to contractor personnel whose activities or responsibilities could affect issues and areas of concern to federally recognized Indian tribes.</p> <p>NA3-1: Consultation with affected federally recognized Indian tribes shall be ongoing during the life of the project.</p> <p>NA3-2: The project developer shall train facility personnel regarding their responsibilities to protect any known resources of importance to federally recognized Indian tribes.</p> <p>NA4-1: The project developer shall confine reclamation and decommissioning activities to previously disturbed areas and existing access roads to the extent practicable.</p> <p>NA4-2: The project developer shall return the site to its pre-construction condition, to the extent practicable and approved by the BLM.</p>
Transportation	<p>T2-1: Project developers shall coordinate with the BLM and other Federal, state, and local agencies to identify and minimize impacts on transportation.</p>

Impact	Mitigation Measure
<b>I. Dry Lake SEZ Programmatic Design Features (cont.)</b>	
Hazardous Materials and Waste	<p>HMW1-1: Project developers shall coordinate with the BLM and other Federal, state, and local agencies early in the planning process to assess hazardous material and waste concerns and to minimize potential impacts.</p> <p>HMW2-1: Solar facilities shall be characterized, sited and designed, and constructed to minimize hazards materials and waste management design elements.</p> <p>HMW3-1: Compliance with the terms and conditions for hazardous materials and waste management shall be monitored by the project developer. Consultation with the BLM shall be maintained through the operations and maintenance of the project, employing an adaptive management strategy and modifications, as necessary and approved by the BLM.</p> <p>HMW4-1: Project developers shall maintain emergency response capabilities throughout the reclamation and decommissioning period as long as hazardous materials and wastes remain on-site.</p>
Hazardous Materials and Waste (cont.)	<p>HMW4-2: All design features developed for the construction phase shall be applied to similar activities during the reclamation and decommissioning phases.</p>
Health and Safety	<p>HS1-1: Project developers shall coordinate with the BLM and other Federal, state, and local agencies early in the planning process to identify project health and safety risks and methods to minimize those risks.</p> <p>HS2-1: Solar facilities shall be characterized, sited and designed, and constructed to minimize risk to health and safety.</p> <p>HS3-1: Compliance with the terms and conditions for health and safety shall be monitored by the project developer. Consultation with the BLM shall be maintained through operations and maintenance of the project, employing an adaptive management strategy and modifications, as necessary and approved by the BLM.</p>
National Scenic and Historic Trails, Suitable Trails, and Study Trails	<p>NSHT1-1: Project developers shall consult with the BLM and the trail administering agency early in the project planning to help determine the proposed project's conformance with trail management prescriptions and other potential trail-related constraints.</p>

**II. EA Design Features**

Impacts from Project construction, operation and decommissioning

In accordance with the Solar PEIS ROD, the Applicant would incorporate programmatic design features into the Project development process to avoid and minimize impacts to the surrounding environment (See Section I above).

Preparation of the following management plans, would be submitted to and approved by the BLM prior to issuance of notice to proceed on the Project:

- |                                                  |                                                |
|--------------------------------------------------|------------------------------------------------|
| 1. Bird and Bat Conservation Strategy            | 10. Integrated Weed Management Plan            |
| 2. Facility Decommissioning Plan                 | 11. Raven Management Plan                      |
| 3. Desert Tortoise Translocation Plan            | 12. Site Rehabilitation Plan                   |
| 4. Emergency Response Plan                       | 13. Site Drainage Plan                         |
| 5. Health and Safety Program (HASP)              | 14. Spill Response Plan                        |
| 6. Hazardous Materials and Waste Management Plan | 15. Transportation Management Plan             |
| 7. Groundwater Monitoring and Reporting Plan     | 16. Water Quality Management Plan              |
| 8. Fire Management Plan                          | 17. Worker Environmental Awareness Plan (WEAP) |
| 9. Lighting Management Plan                      |                                                |

### III. Project Specific Mitigation Measures

#### Visual Resources

VR-1: Methods to minimize glint and glare effects shall include, but are not limited to, the following:

- Limit the use of Project signs and construction signs. Beyond those required for basic facility and company identification for safety, navigation, and delivery purposes, commercial symbols or signs and associated lighting on buildings and other structures shall be prohibited.
- Utilize retroreflective or luminescent markers in lieu of permanent lighting to the extent possible.
- Minimize offsite visibility of all commercial symbols and signs and associated lighting. Necessary signs shall be made of nonglare materials and utilize unobtrusive colors. The reverse sides of signs and mounts shall be painted or coated by using a suitable color selected from the BLM Standard Environmental Color Chart to reduce contrasts with the existing landscape; however, placement and design of any signs required by safety regulations must conform to regulatory requirements.

VR-2: Methods to minimize lighting effects shall include, but are not limited to, the following:

- Lighting control shall be through timers, sensors, dimmers, or switches that are available to facility operators.
- Vehicle mounted lights over permanently mounted lighting shall be used whenever possible for nighttime maintenance activities.
- Vehicle mounted lighting shall be aimed toward the ground to avoid causing glare and skyglow.

VR-3: Methods to minimize visual dominance through site design shall include, but is not limited to, the following:

- Appropriate building and structural materials and surface treatments (i.e., paints or coatings designed to reduce contrast and reflectivity) shall be used to minimize visual impacts. A careful study of the site shall be performed to identify appropriate colors and textures for materials. Materials and surface treatments shall repeat and/or blend with the existing form, line, color, and texture of the landscape. The typical viewing distances and landscape shall be considered when choosing colors. Appropriate colors for smooth surfaces often need to be two to three shades darker than the background color to compensate for shadows that darken most textured natural surfaces. The BLM Standard Environmental Color Chart and guidance shall be referenced when selecting colors.
- Appropriately colored materials for structures or stains/coatings to blend with the Project's backdrop shall be used. Materials, coatings, or paints having little or no reflectivity shall be used whenever possible.
- Solar panel supports (i.e., posts, brackets, and tables) shall be color treated or galvanized to reduce visual contrast within the landscape setting to the extent possible.
- The Applicant shall ensure power poles utilize colors and styles already existing in the visual landscape of the SEZ. The proponent shall ensure the colors of the proposed power poles do not stand out from the other utility lines. The preferred material for the steel monopoles is CorTen weather steel or galvanized steel dull finish.

III. Project Specific Mitigation Measures (Cont.)	
<p>Visual Resources (cont.)</p>	<ul style="list-style-type: none"> <li>• Non-specular conductors and non-reflective coatings on insulators for electricity transmission/distribution facilities shall be used. Galvanized pole finish dulls over time and become non-reflective.</li> <li>• If determined necessary, approved color treatment practices may be used to reduce visual color contrast of graveled or un-graveled surfaces.</li> <li>• Offsite mitigation of visual impacts shall be implemented. Offsite mitigation serves as a means to offset and/or recover the loss of visual landscape integrity. Appropriate offsite mitigation has been determined and outlined in the Dry Lake SEZ SRMS and is addressed through payment by the Applicant of the per acre fee identified in Paragraph B.</li> </ul> <p>VR-4: Methods to minimize visual dominance during operations and maintenance shall include, but is not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Compliance with the terms and conditions for VRM mitigation shall be monitored by the Applicant. Consultation with the BLM shall be maintained through operations and maintenance of the Project, employing an adaptive management strategy and modifications, as necessary and approved by the BLM.</li> <li>• Painted and color treated facilities shall be kept in good repair and repainted when the color fades or flakes.</li> <li>• The use interim restoration shall be employed during the operating life of the Project as soon as possible after land disturbances.</li> <li>• Panels shall be deployed and operated to avoid high intensity light (glare) reflected offsite. Where offsite glare is unavoidable fencing with privacy slats or similar approved screening materials shall be used if possible.</li> </ul>
<p>Cultural Resources (Playa Solar only)</p>	<p>CR-1: The construction zone shall be narrowed or otherwise altered to avoid intact portions of resource 26CK9997, and construction shall be restricted to previously disturbed road beds and graded areas where portions of the trail have already been destroyed. Resource 26CK9997 shall be designated an Environmentally Sensitive Area. Prior to construction, the resource shall be relocated by a qualified archaeologist and shall be marked with exclusion markers to ensure avoidance. Protective fencing shall not identify the protected areas as cultural resource areas in order to discourage unauthorized disturbance or collection of artifacts. A qualified archaeologist shall monitor construction within 100 feet of the Environmentally Sensitive Area.</p> <p>If avoidance of resource 26CK9997 is determined to be infeasible, then, prior to any Project-related ground disturbing activities, a detailed treatment plan shall be prepared and implemented by a qualified archaeologist (defined as one who meets the Secretary of the Interior's professional qualification standards for archaeology). The treatment plan shall include a research design and a scope of work for data recovery of the portion(s) of the resource to be affected by the Proposed Action. Treatment could consist of, but would not be not limited to, sample excavation, surface artifact collection, site documentation, and historical research, with the aim to target the recovery of important scientific data contained in the portion of the significant resource to be impacted by the Proposed Action. The treatment plan shall include provisions for analysis of data in a regional context, reporting of results within a timely manner, and curation of artifacts and data at an approved facility. This mitigation measure applies only to Playa Solar.</p>

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Biological Resources-Wildlife and Aquatic Biota (Playa Solar only)	TECWS-1: The Applicant shall fund the design and installation of crayfish barriers to protect Moapa dace from upstream migration of invasive species through the payment of \$25,000 to BLM. These funds would further the BLM and its partner agencies' existing efforts to eradicate non-native species from the historic range of Moapa dace and thereby promote the continued recovery of this species. This mitigation measure applies only to Playa Solar.
Regional Mitigation Strategy for the Dry Lake Solar Energy Zone	The Applicant shall pay the \$1,836 per acre fee identified in the Regional Mitigation Strategy for the Dry Lake Solar Energy Zone.

## Biological Opinion Mitigation Measures

Desert tortoise remuneration fees at the current rate of \$843/acre will be paid to the BLM (subject to increase after March 1, 2016). The total acres of permanent and temporary disturbance will be adjusted by BLM based upon final site design and disturbance acreage at the time the BLM issues a Notice to Proceed for the project [an increase in habitat disturbance may require reinitiation of consultation].

Long Term Monitoring Plan (Appendix B)- Evaluate effects of translocation on desert tortoise immunity, health, and physiological status by comparing gene transcription levels and traditional health assessments among translocated and reference tortoises. Additional variables for comparison will include measurements of food and cover availability, climate, and associated human impacts.

### Fee Schedule

<b>Project</b>	<b>Project Acres</b>	<b>Section 7</b>	<b>Regional Mitigation</b>	<b>Palliative Study</b>	<b>Long-term Monitoring</b>
Playa Solar	1,521	\$1,282,203	\$2,792,556	\$55,000	\$826,640
NV Energy Dry Lake	751	633,093	1,378,836	22,000	164,361
NV Energy Dry Lake at Harry Allen	55 (new disturbance)	46,365	100,980	0	(both projects)
Invenergy Harry Allen	594	500,742	1,090,584	23,000	620,382
<b>TOTALS</b>	<b>2,921</b>	<b>\$2,462,403</b>	<b>\$5,362,956</b>	<b>\$100,000</b>	<b>\$1,611,383</b>