

# Appendix A: Mitigation and Commitments

Resource	Mitigation and Commitments
<b>Land Use and Community Impacts</b>	<p data-bbox="693 657 1827 706">Mitigation Measure LU-1: Rail Alignment Design in One-Engine Inoperative Zones near McCarran Las Vegas International Airport</p> <p data-bbox="693 714 1827 933">During the design-build process of Project plans in the vicinity of McCarran International Airport (LAS), the Applicant shall coordinate with the Federal Aviation Administration (FAA), the Clark County Department of Aviation (CCDOA), and airlines operating at the airport to avoid impacts to the one-engine inoperative zones and departure conditions under FAA standards. Consistent with <i>Paragraph 6-3-1.b of FAA Order 7400.2G</i>, the Project shall not penetrate the 62.5:1 Obstruction Identification Surface (OIS) at LAS. The Applicant shall provide FRA with written verification of the agreement with the Manager of the FAA's Flight Standards Division, Western-Pacific Region and the CCDOA prior to completion of Project designs for the affected portion of Segment 6B.</p> <hr/> <p data-bbox="693 950 1827 982">Mitigation Measure LU-2: Rail Alignment Design in Existing and Planned Runway Protection Zones</p> <p data-bbox="693 990 1827 1144">During the design-build process of Segment 5B in the vicinity of the proposed Southern Nevada Supplemental Airport, the Applicant shall comply with Federal Aviation Administration (FAA) Airport Design Standards, as specified in FAA Advisory Circular 150/5300-13, <i>Airport Design</i>, concerning land uses within designated Runway Protection Zones, and consult with the Manager of the FAA's Airports Division, Western-Pacific Region to ensure compliance prior to construction. The Applicant is further advised to consult with FAA at the earliest opportunity in the design process.</p>



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<b>Resource</b>	<b>Mitigation and Commitments</b>
<b>Growth</b>	<p>Voluntary Mitigation Measure GRO-1: Voluntary Applicant Coordination with City of Barstow and San Bernardino County for Employment</p> <p>The Selected Alternative includes Victorville OMSF 2, which would be located less than 20 miles south of the City of Barstow. The Victorville OMSF will require hundreds of skilled railroad workers. The Applicant will coordinate with the appropriate City of Barstow and San Bernardino County economic development departments to ensure job opportunities at the maintenance facility are made available to Barstow residents.</p> <p>In addition to permanent jobs during operations, preliminary planning has identified Barstow as a key location for staging and construction support services during the construction, testing, and commissions phases of the Project. The Applicant will work with the City of Barstow to ensure its residents are informed of job opportunities both during construction and operation of the Project. The Applicant will also work closely with the City of Barstow to identify appropriate and beneficial construction and staging activities to be located within the City. Additionally, the Applicant will work with the City to identify and jointly develop programs for job training and technical skills training to support the Project in all phases of design, construction, testing, and commissioning, and operations.</p>
	<p>Voluntary Mitigation Measure GRO-2: Voluntary Applicant Coordination for Land Use Planning</p> <p>The Applicant voluntarily commits to work with local land use planning authorities to encourage implementation of transit oriented and master planned development at the selected station site and surrounding areas; and will work with local transit providers to facilitate intermodal connections where practicable.</p>
<b>Farmlands and Grazing Lands</b>	<p>Mitigation Measure FAR-1: Direct and Indirect Conversion of Protected Farmland</p> <p>Prior to beginning ground disturbance and construction that could indirectly affect farmlands in the vicinity of Newberry Springs the Applicant shall provide documentation of the acquisition of conservation easement(s) over agricultural lands of equal quality to mitigate for direct and indirect impacts related to the permanent conversion of protected agricultural lands (Prime Farmlands, Unique Farmlands, and Farmlands of Statewide and/or Local Importance). This conservation easement(s) shall provide for the conservation of agricultural uses in perpetuity, and be held in trust by a public agency or other appropriate entity. These easements shall be located within the limits of San Bernardino County. Lands to be placed under conservation easement shall be procured on a ratio of 1 acre for each 1 acre of protected farmland</p>



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	converted directly or indirectly to non-agricultural use.
<b><i>Farmlands and Grazing Lands, continued.</i></b>	
	<p>Mitigation Measure FAR-2: Livestock Access to Water</p> <p>Prior to ground disturbance and construction of the Victorville Station and OMSF and Segment 4C the Applicant shall consult with the BLM's range resource managers to determine if the Project will affect livestock access to water on grazing lands. If the BLM's range resource managers determine that construction would block livestock access to critical water sources, the Applicant shall provide alternative water sources as approved by the BLM. Alternatively, the Applicant shall implement Mitigation Measure FAR-6.</p>
	<p>Mitigation Measure FAR-3: Fencing and Gate Modifications</p> <p>Prior to ground disturbance and construction of the Victorville Station Site and OMSF and Segment 4C, the Applicant shall coordinate with the BLM's range resource managers and permittees to locate range improvements that might require special attention when fencing or gates are modified. Gates that do not require removal shall be closed directly after construction traffic has passed through them. The Applicant shall replace all range improvements damaged or removed during construction activities as determined necessary by the BLM.</p>
	<p>Mitigation Measure FAR-4: Provide Adequate Cattle Access in Areas of the Joint NPS/BLM Grazing Allotment</p> <p>Prior to ground disturbance and construction associated with Segment 4C, the Applicant shall incorporate into design-build plans for this Segment adequate cattle undercrossings to allow movement of cattle within the joint BLM/NPS grazing allotment. The location, number and design of the crossings shall be reviewed and approved by the General Manager of the Mojave National Preserve. Alternatively, the Applicant shall implement Mitigation Measure FAR-6.</p>
	<p>Mitigation Measure FAR-5: Purchase Grazing Allotment</p> <p>Prior to construction, the Applicant shall purchase the rights to the grazing allotment(s) directly affected by VV3, OMSF2, and Segment 4C and discontinue grazing activities if determined necessary, based on implementation of Mitigation Measure FAR-3 and Mitigation Measure FAR-5. The purchase of the rights and discontinuing of grazing activities shall be reviewed and approved by the BLM and the General Manager of the Mojave National Preserve, as appropriate.</p>



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<b>Utilities/Emergency Services</b>	<p>Mitigation Measure UTIL-1: Payment of connection and or user/service/tipping fees</p> <p>The Applicant shall bear the costs of any needed connections to utilities and service systems, as well as any usage fees, according to fee schedules as may be established by each utility/service system. Where such fees have not been established, the Applicant shall enter in development agreements with the controlling utility/service system. This shall also include fees associated with any required annexations to utilities or service districts.</p>
	<p>Mitigation Measure UTIL-2: Minimize water usage through the incorporation of water saving devices wherever required or feasible; require drought-tolerant landscaping at all facilities</p> <p>Regarding anticipated water usage in California, the Applicant, in coordination with the Victorville Water Department, shall prepare a Water Supply Assessment. Wherever feasible, the Applicant shall ensure that design-build plans incorporate low water usage practices, including in restrooms and landscaping. Low water usage practices for landscaping shall feature drought-tolerant and/or xeriscape plantings that will minimize and/or avoid the need for any landscape watering.</p>
	<p>Mitigation Measure UTIL-3: Obtain a water commitment from the Las Vegas Valley Water District during the design phase</p> <p>Regarding anticipated water usage in Nevada, prior to construction of any facilities in Nevada, the Applicant shall obtain a water commitment from the Las Vegas Valley Water District (LVVWD). The LVVWD has indicated that anticipated water demand associated with the proposed action would not exceed regional projections. However, LVVWD will not provide any Applicant with an assurance of water availability until the Applicant obtains a “water commitment” from LVVWD to ensure that the proposed action would be served by enough water for usage and to meet fireflow requirements.</p>
	<p>Mitigation Measure UTIL-4: Rail segments within freeway rights-of-way shall tie into existing freeway stormwater conveyance devices</p> <p>In developing and refining design-build plans for the Project, the Applicant shall coordinate with the state transportation agencies in California and Nevada to ensure that Project rail alignments connect to existing stormwater discharge facilities. Along the I-15 corridor, stormwater is discharged from roadways and median areas primarily through culverts or natural and/or manmade channels. New rail segments within the freeway corridor will have the potential to generate additional stormwater requiring discharge. Wherever the addition of Project-generated stormwater would exceed the capacity of</p>

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<b>Resource</b>	<b>Mitigation and Commitments</b>
<b><i>Utilities/Emergency Services, continued.</i></b>	
<i>Mitigation Measure UTIL-4, continued.</i>	<p>existing discharge facilities, the Applicant shall either fund the upsizing of existing facilities or create new facilities that comply with local stormwater regulations. The Applicant shall incorporate all such changes into design-build plans for the Project.</p>
	<p>Mitigation Measure UTIL-5: Develop appropriate stormwater conveyance structures/systems at station and maintenance facility sites, as well as points along railroad segments, where it is not possible to connect to existing systems</p> <p>Where it is not possible to connect to existing systems, the Applicant shall coordinate with the local agencies to develop appropriate stormwater conveyance structures/systems in the areas of the proposed improvements. All of the components that comprise the Project have the potential to generate additional stormwater requiring discharge. The Applicant shall fund the development of facilities for the Project that comply with local stormwater regulations.</p>
	<p>Mitigation Measure UTIL-6: Payment of impact fees for police, fire, and emergency services</p> <p>The Applicant shall pay any appropriate development impact fees established by the affected agencies at the time the Applicant seeks a permit to construct to support the incremental demand for additional police, fire, and emergency services at proposed stations and maintenance facilities, as well as along rail alignments in times of emergencies, created by the Project. Where such fees have not been established, the Applicant shall enter in development agreements with the appropriate entities.</p>
	<p>Mitigation Measure UTIL-7: Develop a comprehensive emergency operations plan</p> <p>The Applicant shall develop and implement an emergency preparedness plan that complies with the provisions set forth in FRA's most current <i>Guide to Developing a Passenger Train Emergency Preparedness Plan</i>. This plan shall set forth protocols in the event of train derailments and other catastrophic events. The Applicant shall be responsible for conducting briefings and/or trainings on the plan with all appropriate employees, as well as with representatives of local first responders and transportation agencies. This may include a training of local first responders regarding proposed rail facilities, including train sets, any catenary structures, and other unique features. The plan shall set forth appropriate lines of communication in the event of emergency events. The plan shall specifically identify protocols in the event an emergency involving a train derailment and blockage of any freeway lanes, an emergency in the proposed tunnels within Segment 4C, and emergencies involving loss of locomotive power.</p>

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<b>Utilities/Emergency Services, continued.</b>	
<i>Mitigation Measure UTIL-7, continued.</i>	<p>The Applicant shall file one copy of the proposed emergency preparedness plan with the FRA's Associate Administrator for Railroad Safety/Chief Safety Officer not less than 45 days prior to commencing the passenger train service. The FRA will conduct a review of the proposed plan to determine whether the elements prescribed in 49 CFR 239 are sufficiently addressed and discussed in the proposed plan. The FRA must issue a final approval letter to the Applicant prior to opening services to the public.</p>
	<p>Mitigation Measure UTIL-8: Avoid or minimize conflicts with existing utility infrastructure</p> <p>The Applicant shall implement the measures listed below to avoid or minimize potential adverse effects to water, wastewater, communications, local gas pipelines, and other physical facilities that the proposed rail alignments and/or stations would cross.</p> <p><b>Water utilities:</b> Protect pipelines/canals in place; span any crossings of open canals.</p> <p><b>Local natural gas distribution systems:</b> Protect/encase pipelines in place; utilize alternating current since the EMU locomotive option was selected.</p> <p><b>Fiber optic/communications lines:</b> Protect line, as appropriate</p> <p>If the adjustment or relocation of any existing utility or pipeline or any permitted encroachment is unavoidable, the Applicant shall be responsible for all costs to the utility facility.</p> <p>Additional mitigation for electrical transmission lines and major petroleum pipelines is provided below.</p> <p><i>Electrical transmission lines:</i> Throughout the design-build process, the Applicant shall continue to coordinate closely with all electric utilities to ensure that design-build Project plans incorporate requirements that may be set forth for development beneath electrical transmission lines.</p> <p>When grading activity affects access roads associated with the Los Angeles Department of Water and Power (LADWP) transmission line, the Applicant shall replace the affected access roads using the LADWP's Access Road Design Criteria.</p> <p><i>Petroleum pipelines:</i> Throughout the design-build process, the Applicant shall continue to coordinate with pipeline companies to ensure that design-build Project plans incorporate measures to encase/protect all pipelines as needed to minimize any possible conflict, including any possible concerns about stray electrical current.</p>

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<b>Traffic and Transportation</b>	<p>Mitigation TRAF-1: Victorville Station Site Option 3</p> <p>The Applicant shall be responsible to contribute to these mitigations equal to their fair share of the adverse effect as determined by the appropriate jurisdictional authority (the California Department of Transportation, District 8; and/or the City of Victorville, and/or San Bernardino County):</p> <ul style="list-style-type: none"> <li>▪ Intersection 1: I-15 Northbound Ramps/Dale Evans Parkway               <ul style="list-style-type: none"> <li>• Opening Year: Add two northbound left turn lanes</li> <li>• 2030: Add northbound left turn lane</li> </ul> </li> <li>▪ Intersection 2: I-15 Southbound Ramps/Dale Evans Parkway               <ul style="list-style-type: none"> <li>• Opening Year: Add eastbound right turn lane Add second westbound through lane Add westbound left turn lane</li> <li>• 2030: Add second eastbound right turn lane</li> </ul> </li> <li>▪ Intersection 3: Station Access #1/Dale Evans Parkway               <ul style="list-style-type: none"> <li>• Opening Year: Signalize Add second westbound left turn lane</li> <li>• 2030: N/A</li> </ul> </li> <li>▪ Intersection 5: Future Street/Dale Evans Parkway               <ul style="list-style-type: none"> <li>• Opening Year: Signalize Add second westbound left turn lane</li> <li>• 2030: Add third westbound left turn lane</li> </ul> </li> <li>▪ Intersection 7: Future Street/Station Access #4               <ul style="list-style-type: none"> <li>• Opening Year: Signalize</li> <li>• 2030: N/A</li> </ul> </li> </ul>
	<p>Mitigation TRAF-2: Las Vegas Southern Station</p> <p>If the Las Vegas Southern Station is constructed, the Applicant shall be responsible to contribute to these mitigations equal to their fair-share of the adverse effect as determined by the appropriate jurisdictional authority (the Nevada Department of Transportation and/or Clark County):</p>



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Resource	Mitigation and Commitments
<b>Traffic and Transportation, continued.</b>	
<i>Mitigation TRAF-2, continued.</i>	<ul style="list-style-type: none"> <li>▪ Intersection 1: Tropicana/ Valley View               <ul style="list-style-type: none"> <li>• Opening Year: Add exclusive southbound free right turn lane.</li> <li>• 2030: Add exclusive westbound right turn lane. Add second southbound left turn lane.</li> </ul> </li> <li>▪ Intersection 2: Tropicana/Dean Martin Drive-Industrial               <ul style="list-style-type: none"> <li>• Opening Year: Optimize signal offset along Tropicana</li> <li>• 2030: Add fourth eastbound through lane. Add fourth westbound through lane.</li> </ul> </li> <li>▪ Intersection 3: Tropicana/I-15 NB Ramps               <ul style="list-style-type: none"> <li>• Opening Year: N/A</li> <li>• 2030: Add second northbound right turn lane.</li> </ul> </li> <li>▪ Intersection 6: Hacienda/Polaris               <ul style="list-style-type: none"> <li>• Opening Year: Signalize this intersection.</li> <li>• 2030: N/A</li> </ul> </li> <li>▪ Intersection 7: Hacienda/Valley View               <ul style="list-style-type: none"> <li>• Opening Year: N/A</li> <li>• 2030: Add second eastbound left turn lane. Add exclusive eastbound right turn lane. Add third eastbound through lane. Add exclusive westbound right turn lane. Add third westbound through lane. Add second northbound left turn lane. Add third northbound through lane.</li> </ul> </li> </ul>



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Resource	Mitigation and Commitments
<i>Traffic and Transportation, continued.</i>	
<i>Mitigation TRAF-2, continued.</i>	<ul style="list-style-type: none"> <li>▪ Intersection 8: Russell/Polaris               <ul style="list-style-type: none"> <li>• Opening Year: Add exclusive westbound right turn lane. Add exclusive northbound right turn lane. Add southbound dual left turn lanes. Add exclusive southbound right turn lane.</li> <li>• 2030: Add third southbound left turn lane.</li> </ul> </li> <li>▪ Intersection 9: Russell/I-15 SB ramps               <ul style="list-style-type: none"> <li>• Opening Year: Optimize signal offset along Russell Road</li> <li>• 2030: N/A</li> </ul> </li> <li>▪ Intersection 10: Russell/I-15 NB ramps               <ul style="list-style-type: none"> <li>• Opening Year: N/A</li> <li>• 2030: Optimize signal offset along Russell Road</li> </ul> </li> </ul>
	<p>Mitigation TRAF-3: Las Vegas Central Station B</p> <p>If the Las Vegas Central Station B is constructed, the Applicant shall be responsible to contribute to these mitigations equal to their fair-share of the adverse effect as determined by the appropriate jurisdictional authority (the Nevada Department of Transportation and/or Clark County):</p> <ul style="list-style-type: none"> <li>▪ Intersection 1: W. Flamingo Road/Hotel Rio Drive               <ul style="list-style-type: none"> <li>• Opening Year: Add fourth eastbound through lane. Add second westbound left turn lane. Add fourth westbound through lane. Add second northbound right turn lane.</li> <li>• 2030: Stripe existing northbound through lane as a share through/right turn lane.</li> </ul> </li> <li>▪ Intersection 3: W. Flamingo/I-15 NB ramps               <ul style="list-style-type: none"> <li>• Opening Year: N/A</li> <li>• 2030: Add fourth westbound through lane.</li> </ul> </li> </ul>

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Resource	Mitigation and Commitments
<i>Traffic and Transportation, continued.</i>	
<i>Mitigation TRAF-3, continued.</i>	<ul style="list-style-type: none"> <li>▪ Intersection 4: Hotel Rio Drive/Dean Martin Drive               <ul style="list-style-type: none"> <li>• Opening Year: Modify eastbound right turn to have overlap phasing.</li> <li>• 2030: Add second northbound left turn lane.</li> </ul> </li> <li>▪ Intersection 7: W. Tropicana Avenue/Dean Martin Drive               <ul style="list-style-type: none"> <li>• Opening Year: Add exclusive eastbound right turn lane. Add exclusive westbound right turn lane. Add exclusive northbound right turn lane. Add third southbound left turn lane.</li> <li>• 2030: Add fourth eastbound through lane. Add fourth westbound through lane.</li> </ul> </li> <li>▪ Intersection 9: Tropicana Avenue/I-15 NB Ramp               <ul style="list-style-type: none"> <li>• Opening Year: N/A</li> <li>• 2030: Add second northbound right turn lane.</li> </ul> </li> </ul>
	<p>Mitigation Measure TRAF-4: Conduct a Design Review within the Parameters Defined in the Highway Interface Manual</p> <p>The Applicant shall coordinate with the State Departments of Transportation, FHWA division offices, and FRA for the design review and approval of specific Project components within the existing I-15 right-of-way. The design review shall be conducted within the parameters defined in the Highway Interface Manual (incorporated in the Final EIS as Appendix F-B). The procedures for the design review shall be agreed to by the Applicant and transportation agencies in a separate agreement.</p> <p>The design review shall be used to determine the following:</p> <ul style="list-style-type: none"> <li>▪ Permanent placement of visual barriers from a motorist perspective;</li> <li>▪ Need for standard highway work area traffic control measures both within and beyond the clear zone; and</li> <li>▪ Appropriate protocols for access to the railroad from I-15, for operations, maintenance, or operations, and to ensure the ability to meet codes.</li> </ul>

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<i>Traffic and Transportation, continued.</i>	
<i>Mitigation TRAF-4, continued.</i>	<p>Project components within the I-15 right-of-way that require approval by the highway agencies for traffic safety, and to avoid vehicle intrusion into the railroad right-of-way, include the following:</p> <ul style="list-style-type: none"> <li>▪ Clear zone modifications</li> <li>▪ Barriers</li> <li>▪ Bridges and tunnels</li> <li>▪ Vertical clearance</li> <li>▪ Retaining walls</li> <li>▪ Drainage</li> <li>▪ Median crossings</li> <li>▪ Sight distance</li> <li>▪ Security plans</li> <li>▪ Fencing</li> <li>▪ Visual screening</li> <li>▪ Locked-gate access</li> <li>▪ Temporary construction access</li> <li>▪ Freeway interchanges or ramps and modifications</li> <li>▪ Signing and striping</li> <li>▪ Emergency preparedness plans</li> </ul>

**Visual Resources**

Mitigation Measure VIS-1: Rail Features

Per Mitigation Measure TRAF-4, the State Departments of Transportation, the FHWA division offices, and the FRA shall review the design of rail features within the I-15 freeway right-of-way. The Applicant shall ensure that design-build Project plans include design rail features, including pillars, raised tracks, trains, catenary structures, crash barriers, and embankments to blend with or represent the surrounding desert environment. The Applicant shall create the features in muted desert colors and avoid bright colors and highly reflective materials. The Applicant shall define in the design-build process certain rail features to include visual treatments and/or elements that create a sense of place and a memorable



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<b>Resource</b>	<b>Mitigation and Commitments</b>
<i>Visual Resources, continued</i>	
<i>Mitigation Measure VIS-1, continued.</i>	<p>experience for both motorists and pedestrians. Concrete shall be embossed with symbols or patterns, where appropriate, which create a visual link between rail features and the surrounding communities and/or the non-urbanized landscape.</p> <p>In coordination with the State Departments of Transportation, the FHWA division offices, and the FRA, design-build plans shall incorporate visual screening on the top of crash barriers along the entire rail corridor to mitigate any potential visual distraction to motorists from the trains and train lights. Coordination with the above agencies shall establish specific details regarding the type of screening and may also identify locations where such screening is not necessary and thus would not need to be included in design-build plans.</p>
	<p><b>Mitigation Measure VIS-2: Victorville Station Features</b></p> <p>The Applicant shall ensure that design build plans for the Victorville Station and its associated elements, such as the parking garages and pedestrian walkways, incorporate architecture, muted colors, and landscaping that reflect the surrounding non-urbanized aesthetic. The landscaping plan shall include the use of drought resistant desert plants, gravel, and stone. Pedestrian elements such as pathways and portals in both the station building and the associated garages shall incorporate desert elements such as landscaping, muted colors, and the use of desert-related symbols and patterns. Signage shall be consistent with the scale and character of the site and surroundings and avoid the use of highly reflective materials or bright neon lights.</p>
	<p><b>Mitigation Measure VIS-3: Maintenance Facility Features</b></p> <p>The Applicant shall ensure that design build plans for the maintenance facilities in California and Nevada are aesthetically appropriate for the surrounding non-urbanized landscapes through the use of muted colors and desert landscaping. The use of highly reflective materials shall be avoided. Concrete may be embossed with desert symbols and patterns.</p>
	<p><b>Mitigation Measure VIS-4: Contour Grading</b></p> <p>Where feasible, the design-build Project plans shall employ contour grading techniques to reduce the visual appearance of cuts and fill slopes. Grades, cuts, and fills shall be shaped so as to appear consistent and continuous with the natural landscape forms.</p>

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<i>Visual Resources, continued</i>	
	<p>Mitigation Measure VIS-5: Light and Glare Reduction</p> <p>The Applicant shall ensure that design-build Project plans for lighting at stations and maintenance facilities outside of the metropolitan Las Vegas area minimize disruption of the natural dark at night. The final lighting plan for these stations and maintenance facilities shall incorporate light and glare screening measures such as the use of plantings to screen well-lit areas, use of downward cast lighting, and the use of motion sensor lighting where appropriate.</p>
	<p>Mitigation Measure VIS-6: Educational Displays</p> <p>Within California, the Applicant shall provide interpretive displays and artwork in station pedestrian areas in order to create a coherent pedestrian landscape and sense of place. Such displays shall be consistent with pertinent guidelines of the Desert Managers Group (a consortium of federal and state agencies).</p>
	<p>Mitigation Measure VIS-7: Construction Site Management</p> <p>The Applicant shall maintain construction areas in an orderly manner, including proper containment and disposal of litter and debris to prevent dispersal onto adjacent properties or streets.</p>
	<p>Mitigation Measure VIS-8: Construction Site Lighting</p> <p>The Applicant shall ensure construction crews working at night direct any artificial lighting onto the work area to minimize the spillover of light or glare onto adjacent areas. Where feasible, construction lighting shall be screened from viewer groups - such as motorists on the freeway or residents in nearby towns and communities to prevent visible lighting overflow into the natural dark of the desert at night.</p>
	<p>Mitigation Measure VIS-9: Visual Screening</p> <p>The Applicant shall erect visual screening along construction areas as appropriate to ensure safety and minimize visual intrusions.</p>
	<p>Mitigation Measure VIS-10: Freeway Landscaping</p> <p>The Applicant shall replace landscaping that will be removed during construction as directed by the pertinent State Department of Transportation. Landscaping in Nevada along the I-15 freeway shall follow the Nevada Department of Transportation's (NDOT's) <i>I-15 Landscape and Aesthetics Corridor Plan, 2005</i>. Replacement landscaping shall occur in the median, along the shoulder, and in other right-of-way areas along the I-15 freeway, as appropriate, within six months of the completion of construction. In accordance with the NDOT's Landscape and Aesthetics Master Plan, up to three percent of the total construction cost of Nevada portions of the project may be allocated to landscape and aesthetic</p>

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	treatments, with NDOT funding the consultant cost for landscape and design.
<b>Cultural and Paleontological Resources</b>	
	<p>Mitigation Measure CR-1: Avoidance of Archaeological Resources</p> <p>The Applicant shall attempt to avoid archeological resources through Project design, as determined feasible in coordination with FRA and BLM. Prior to determining whether avoidance is feasible however, it may be necessary to conduct test excavations to determine the vertical and horizontal extent of resources. Once avoidance can be assured, resource location information would be placed on construction drawings in design build plans as locations to be monitored throughout construction. If during monitoring it was determined that avoidance was infeasible then the process outlined below under Evaluation (Mitigation Measure CR-2) would be followed.</p>
	<p>Mitigation Measure CR-2: Evaluation</p> <p>Prior to the commencement of ground disturbing activities, the FRA shall, in consultation with the cooperating agencies and with the Consulting Tribes, evaluate all cultural resources located within the Area of Potential Effect for the Selected Alternative for eligibility for listing in the National Register of Historic Places. With the exception of the expedited procedures outlined within the Programmatic Agreement developed for the Project (as set forth in Final EIS Appendix F-H), the FRA and the cooperating agencies will follow the provisions of 36 CFR §800.4(c). Evaluation methods and criteria shall be consistent with the Secretary of the Interior's Standards and Guidelines for Evaluation (48 Federal Register 44729-44738) (36 CFR Part 63).</p> <p>To the extent practicable, the FRA shall make eligibility determinations based on inventory information. If the information gathered in the inventory is inadequate to determine eligibility, the FRA, through its contractors and subcontractors, shall conduct limited subsurface testing or other evaluative techniques to determine eligibility.</p> <p>As needed, the FRA, in consultation with the signatories and other cooperating agencies, shall develop testing plans and consolidate all testing plans into one submission per state for concurrence by the appropriate State Historic Preservation Officer.</p> <p>Consistent with term III.B.7 of the Programmatic Agreement for the Project, the Applicant shall make all reasonable efforts to ensure that Native American monitor(s) designated by the Consulting Tribes are present during archaeological test excavation.</p>

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<b><i>Cultural and Paleontological Resources, continued.</i></b>	
	<p>Mitigation Measure CR-3: Treatment</p> <p>The FRA, in consultation with the cooperating agencies and the Consulting Tribes, shall develop one or more Historic Properties Treatment Plan(s) in accordance with the procedures outlined in Attachment D of the Programmatic Agreement for the Project (see Final EIS Appendix F-H). The FRA shall ensure mitigation for resources that are determined to be significant under National Register Criteria A, B, and C (36 CFR 60.4), such as the Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) program. The FRA shall follow the process outlined in the HPTP to conduct data recovery and any other appropriate mitigation. All archaeological work on National Register-eligible properties shall be conducted in accordance with "Treatment of Archaeological Properties: A Handbook" and "Archaeology and Historic Preservation: the Secretary of the Interior's Standards and Guidelines." Investigations shall be performed under the supervision of professionals whose education and experience meet or exceed the Secretary of the Interior's "Professional Qualifications Standards."</p> <p>The FRA shall ensure that curation of records and other cultural materials resulting from identification and data recovery efforts on federal lands is handled in accordance with 36 CFR Part 79. All archaeological materials recovered from federal lands shall be curated in accordance with 36 CFR Part 79 in the repository/repositories indicated in the original permit.</p> <p>No federal agency shall authorize access to lands or construction of any individual segment of the Project until receipt of concurrence from the appropriate State Historic Preservation Officer that the mitigation efforts have met the terms of the Historic Properties Treatment Plan(s) and the Section 106 responsibilities as described in the PA have been fulfilled for that segment.</p>
	<p>Mitigation Measure CR-4: Monitoring</p> <p>Portions of the Area of Potential Effect for the Selected Alternative have been determined to have the potential for buried resources. During construction, and consistent with the terms of the PA, the Applicant shall ensure Native American monitor(s) designated in consultation with the Consulting Tribes will be present within those sections identified in the Historic Properties Treatment Plan(s) as moderately to highly sensitive for prehistoric and historical archaeological deposits. The Historic Properties Treatment Plan(s) shall also outline the locations of monitoring, frequency and duration as well as the process to follow when monitoring results in an unanticipated discovery. Specifically, any unanticipated resources that are identified during monitoring shall be evaluated and treated in accordance with the requirements of the Historic Properties Treatment Plan(s) and the Programmatic Agreement for the Project (see Final EIS Appendix F-H). If human remains are discovered during monitoring, the regulatory requirements</p>



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	described in Mitigation Measure CR-6 shall be followed.
<b><i>Cultural and Paleontological Resources, continued.</i></b>	
	<p>Mitigation Measure CR-5: Preconstruction Meeting and Worker Awareness Training</p> <p>The Applicant shall ensure that all persons meeting the Secretary of the Interior's <i>Professional Qualifications Standards</i> who are supervising activities conducted as prescribed in the Programmatic Agreement for the Project (see Final EIS Appendix F-H) and all contracted field personnel, including construction workers, meet with one or more Consulting Tribes for a briefing on traditional customs and culturally sensitive protocols and procedures.</p>
	<p>Mitigation Measure CR-6: Human Remains and Stop Work Requirement</p> <p>As described in Stipulation III.G and Attachment E of the Programmatic Agreement for the Project (see Final EIS Appendix F-H), the FRA, in consultation with the cooperating agencies, Consulting Tribes, and the Applicant, shall develop a Native American Graves Protection and Repatriation Act Plan of Action (NAGPRA POA).</p> <p>The Applicant shall ensure that if human remains are inadvertently discovered during archaeological investigation or construction activities, all ground disturbing activities will cease within 50 feet in all directions of human remains and the Applicant shall immediately notify FRA. The FRA will notify the appropriate parties in accordance with the NAGPRA POA.</p> <p>The Applicant and the FRA shall treat human remains and grave goods in accordance with all appropriate state or federal laws. If the remains are found on state or private land within California, the FRA shall ensure the requirements of Public Resources Code (PRC) 5097 are met. If human remains are identified on state or private land within Nevada, the FRA shall ensure the requirements of Nevada Revised Statutes (Section 383.160) and (Section 383.170) are met.</p>
	<p>Mitigation Measure CR-7: Annual Reporting</p> <p>Consistent with Administrative Stipulation IV.B of the Programmatic Agreement for the Project (PA; see Final EIS Appendix F-H), the Applicant shall submit to the FRA an annual report documenting the completion status of the stipulations outlined in the PA. The Annual Report shall include, at a minimum:</p> <ul style="list-style-type: none"><li>a. A list of all studies, reports, actions, evaluations, or monitoring reviewed or generated under the Stipulations of the PA.</li><li>b. Efforts to identify and/or evaluate potential historic properties, monitoring efforts, archaeological management assessments or research designs, and treatment of historic properties.</li></ul>



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	<ul style="list-style-type: none"> <li>c. Any recommendations to amend the PA or improve communications among the parties.</li> <li>d. A discussion of any inadvertent effects to historic properties occurring during the course of the year.</li> </ul>
<b><i>Cultural and Paleontological Resources, continued.</i></b>	
<i>Mitigation Measure CR-7, continued.</i>	<p>Consistent with the terms of the PA, the FRA shall ensure that the annual report is made available to the public and that members of the public are invited to provide comments to FRA, as well as to the Advisory Council on Historic Preservation and the State Historic Preservation Officers for California and Nevada.</p>
	<p>Mitigation Measure CR-8: Quarterly Reporting</p> <p>The Applicant shall prepare quarterly progress reports on the status of Project construction and submit all such reports to FRA. As lead agency, the FRA will be responsible for coordinating and submitting the report to Consulting Tribes (and, as necessary, cooperating agencies). The Quarterly report shall include, at a minimum, anticipated needs for Tribal representative monitors in the upcoming months.</p>
	<p>Mitigation Measure CR-9: Further Evaluation of Geologic Units</p> <p>Before ground-disturbing activities begin, the Applicant shall retain a qualified paleontologist as defined by the Society of Vertebrate Paleontology Conformable Impact Mitigation Guidelines Committee (1995) or other appropriate personnel (e.g., California licensed professional geologist with appropriate experience and expertise) to conduct further literature review and discussion with subject area experts in order to resolve the paleontological sensitivity of any geologic units identified in the Final EIS as “undetermined” and the areas with strata of Holocene age exposed at the surface. If site-specific engineering geologic or geotechnical studies for the Project identify additional units likely to be affected by Project construction, they shall also be evaluated for paleontological sensitivity under this measure.</p> <p>This information shall be used to guide mitigation requirements on a site-specific basis during construction and during maintenance activities that require ground disturbance, as follows.</p> <ul style="list-style-type: none"> <li>▪ Mitigation Measures CR-10, CR-11, and CR-12 shall apply to all ground-disturbing construction and maintenance activities.</li> <li>▪ Mitigation Measures CR-13 shall apply to all ground-disturbing construction activities that affect geologic units identified as highly sensitive for paleontological resources, and to all maintenance activities that would involve new or extended ground disturbance in highly sensitive units.</li> </ul>
	<p>Mitigation Measure CR-10: Preconstruction Meeting and Worker Awareness Training</p> <p>The Applicant shall ensure that all construction and maintenance personnel receive paleontological</p>



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	resources awareness training that includes information on the possibility of encountering fossils during construction; the types of fossils likely to be seen, based on finds in the site vicinity; and proper procedures in the event fossils are encountered.
<b><i>Cultural and Paleontological Resources, continued.</i></b>	
<i>Mitigation Measure CR-10, continued.</i>	Worker training shall be prepared and presented by a qualified paleontologist as defined by the Society of Vertebrate Paleontology Conformable Impact Mitigation Guidelines Committee (1995) or other appropriate personnel (e.g., California licensed professional geologist with appropriate experience and expertise) experienced in teaching non-specialists. It may be delivered at the same time as other pre-planned construction worker education, or it may be presented separately.
	<p>Mitigation Measure CR-11: Paleontological Monitoring</p> <p>Full-time paleontological monitoring shall be conducted for all ground-disturbing activities in portions of the proposed rail alignment and facilities with substrate materials identified in the Final EIS as highly sensitive for paleontological resources. Full-time monitoring will also be required where Holocene materials overlie highly sensitive strata and site-specific investigations have identified the potential for Project activities to involve the underlying sensitive strata.</p> <p>A trained paleontological monitor shall oversee all ground-disturbing activities that affect highly sensitive substrate materials, as identified in the EIS, including vegetation removal, site preparation, construction grading and excavation, and any drilling for piers or pilings. Paleontological monitoring shall consist of observing operations and periodically inspecting disturbed, graded, and excavated surfaces. The monitor shall have authority to divert grading or excavation away from exposed surfaces temporarily in order to examine disturbed areas more closely, and/or recover fossils. The responsible paleontologist shall coordinate with the construction manager to ensure that monitoring is thorough but does not result in unnecessary delays.</p> <p>If additional personnel are needed for effective monitoring, the responsible paleontologist may train other consultant or in-house staff in paleontological monitoring. Once training is complete, individuals trained by the qualified paleontologist may then monitor the proposed Project construction independently, and shall have the same responsibilities as described above.</p>
	<p>Mitigation Measure CR-12: Stop Work Requirement</p> <p>If fossil materials are discovered during any Project-related activity, including but not limited to Project grading and excavation, all ground-disturbing work in the vicinity of the find shall stop immediately until the responsible paleontologist can assess the nature and importance of the find and recommend</p>

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	appropriate treatment. Assessment shall occur in a timely manner, and recommendations for treatment shall be consistent with practices of the Society of Vertebrate Paleontology Conformable Impact Mitigation Guidelines Committee (1995). Treatment may include preparation and recovery of fossil materials so that they can be housed in an appropriate museum or university collection, and may also
<b><i>Cultural and Paleontological Resources, continued.</i></b>	
<i>Mitigation Measure CR-12, continued.</i>	include preparation of a report for publication describing the finds. If no report is required, the Applicant will nonetheless ensure that information on the nature, location, and depth of all finds is readily available to the scientific community. The responsible paleontologist and all paleontological monitors shall be empowered to temporarily halt or redirect the excavation equipment away from fossils to be salvaged.
	<p>Mitigation Measure CR-13: Fossil Recovery and Curation</p> <p>If fossil materials are discovered during Project-related activities, the responsible paleontologist shall determine whether recovery and curation is warranted, and shall be empowered to confer with local area experts as needed to arrive at a determination. All materials warranting recovery shall be stabilized on the site and then salvaged consistent with currently accepted procedures and the prevailing standard of care for paleontological excavations. The responsible paleontologist shall coordinate with the construction manager to ensure that specimen recovery proceeds in a timely manner.</p> <p>Recovered fossils shall be prepared for identification consistent with currently accepted procedures and the prevailing standard of care. They shall then be identified by competent specialists, potentially including, but not necessarily limited to, the responsible paleontologist. If possible, identification shall include genus, species, and, if applicable, subspecies. If species-level identification is not feasible, the maximum feasible level of specificity shall be provided. The fossil assemblage shall then be analyzed by stratigraphic occurrence and any other applicable parameters, such as size, taxa present, and/or taphonomic conditions. A faunal list shall be developed.</p> <p>Any specimens (fossils) of paleontological significance found during construction shall be temporarily housed in an appropriate museum or university collection. If curation is required, the responsible paleontologist shall develop appropriate curation agreements, consistent with applicable protocols and the prevailing standard of care.</p> <p>The responsible paleontologist shall prepare a final report that includes at least the following components:</p> <ul style="list-style-type: none"> <li>▪ Information on site geology and stratigraphy, including a stratigraphic column;</li> <li>▪ A description of field and laboratory methods;</li> <li>▪ A faunal list, with stratigraphy ranges/occurrences for each taxon;</li> </ul>

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	<ul style="list-style-type: none"> <li>▪ A concise discussion of the significance of the site and its relationship to other nearby and/or similar fossil localities;</li> <li>▪ A list of references consulted during the Project, including published geologic maps for the site and vicinity; and</li> </ul>
<b><i>Cultural and Paleontological Resources, continued.</i></b>	
<i>Mitigation Measure CR-13, continued.</i>	<ul style="list-style-type: none"> <li>▪ A complete set of field notes, field photographs, and any new geologic maps developed for or during the Project.</li> </ul> <p>Full copies of the final report, including any appended materials, shall be put on file with any repository institution(s). Depending on the nature of the materials recovered, it may also be appropriate to prepare a report for publication in an appropriate peer-reviewed professional journal. Such publication shall be at the discretion of the responsible paleontologist.</p>
<b>Hydrology and Water Quality</b>	
	<p>Mitigation Measure HYD-1: Incorporate Site-Specific Permanent Water Quality Treatment Devices</p> <p>To protect water quality the Applicant shall install permanent water quality treatment devices. Examples of water quality best management practices (BMPs) may include a vegetated swale, traction sand traps, or settling basin to help remove sediments and nutrients. Such BMPs shall be sized properly and designed by a registered professional engineer and shall not allow untreated stormwater runoff to reach the Mojave River or any washes along the alignment, including those washes in the urbanized area of Las Vegas.</p>
	<p>Mitigation Measure HYD-2: Implement Construction-Related Best Management Practices (BMPs)</p> <p>The Applicant shall initiate construction activities with the installation of erosion control BMPs. Within design-build plans, the Applicant shall identify specifications of BMPs for grading and erosion control that are necessary to reduce erosion and sedimentation. These BMPs shall be selected to achieve maximum sediment removal and represent the best available technology that is economically achievable. Standard erosion control measures, such as management, structural, and vegetative controls, shall be implemented for all construction activities that expose soil. BMPs to be implemented as part of this mitigation measure may include, but are not limited to, the following measures:</p> <p>Temporary erosion control measures that would apply to construction of the stations, maintenance facilities and the rail (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover) shall be employed to control erosion from disturbed areas. Grass or other vegetative cover shall be established on the</p>

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	<p>construction site as soon as possible after disturbance. Erosion in disturbed areas shall be controlled by grading so that direct routes for conveying runoff to drainage channels are eliminated.</p> <p>The general contractors and subcontractors conducting the work shall construct or implement, regularly inspect, and maintain the BMPs in design-build Project plans. Some methods of Construction BMPs for rail installation that shall be included in the Project are:</p>
<b>Hydrology and Water Quality, continued.</b>	
<p><i>Mitigation Measure HYD-2, continued.</i></p>	<ul style="list-style-type: none"> <li>▪ Install erosion control material consisting of silt fences along the outside limits of construction on both sides of the disturbance corridor for track construction;</li> <li>▪ Clear the construction area of brush and vegetation;</li> <li>▪ Strip any topsoil and transport it to stockpile;</li> <li>▪ Excavate material as required to extend any culverts using good quality material as fill and transport poor quality material to stockpile;</li> <li>▪ Place quality fill material to establish the subgrade;</li> <li>▪ Install the sub-ballast on the subgrade, composed of crushed rock that has sufficient strength to withstand settling from loads;</li> <li>▪ Place standard rail ties, made of wood or concrete, on the sub-ballast, then place the rail on the ties, and anchor the rail to the ties;</li> <li>▪ Bring in ballast and dump ballast rock between and along the sides of the track; and</li> <li>▪ Use a tamper to raise the track and tamp the ballast beneath the ties.</li> </ul>
	<p>Mitigation Measure HYD-3: Comply with the National Pollutant Discharge Elimination System (NPDES) Construction General Permit</p> <p>The Applicant shall obtain coverage under the NPDES Construction General Permit. Most construction projects that disturb one acre of land or more are required to obtain coverage under the NPDES Construction General Permit, which required the property owner to file a Notice of Intent to discharge stormwater and to prepare and implement a stormwater pollution prevention plan (SWPPP). Implementing the requirements in the NPDES Construction General Permit will reduce or eliminate construction-related water quality effects. The Applicant shall ensure that construction activities comply with the conditions in this permit, which will require preparation of a stormwater pollution prevention plan (SWPPP), implementation of BMPs identified in the SWPPP, and monitoring to ensure that effects on water quality are minimized.</p>

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	<p>The Applicant shall implement the SWPPP. The implementation of the SWPPP in design-build Project plans will reduce the likelihood that stormwater will carry any spilled contaminants to water channels and reduce construction related impacts.</p>
<b><i>Hydrology and Water Quality, continued.</i></b>	
	<p>Mitigation Measure HYD-4: Implement Spill Prevention, Control, and Countermeasure Plan</p> <p>Prior to beginning any construction activity, the Applicant shall develop a spill prevention, control, and countermeasure plan (SPCCP) to prevent accidental releases of chemicals that are stored on site and measures to use in the case of a spill. The BMPs described in this plan shall apply to construction activities and operation activities.</p> <p>The Applicant shall implement appropriate hazardous material management practices identified in the SPCCP to reduce the potential for chemical spills or releases of contaminants, including any non-stormwater discharge to drainage channels. If a spill occurs, cleanup, containment, and response measures in the SPCCP shall be implemented by the Applicant.</p> <p>The federal reportable spill quantity for petroleum products, as defined at 40 CFR 110, is any oil spill that (1) violates applicable water quality standards, (2) causes a film or sheen upon or discoloration of the water surface or adjoining shoreline, or (3) causes a sludge or emulsion to be deposited beneath the surface of the water or adjoining shorelines.</p> <p>If a spill is reportable, a superintendent shall notify appropriate agencies and the contractor will need to take action to contact any other appropriate safety and clean-up crews to ensure the SPCCP is followed. A written description of reportable releases shall be submitted to the appropriate agency. This submittal shall include a description of the release, including the type of material and an estimate of the amount spilled, the date of the release, an explanation of why the spill occurred, and a description of the steps taken to prevent and control future releases. The release shall be documented on a spill report form.</p>
	<p>Mitigation Measure HYD-5: Proper Design of Drainage Systems</p> <p>Most of the rail segments would not result in a large amount of impervious surface that could concentrate and redirect stormwater flow causing onsite erosion. Runoff from the rail alignment would be captured and directed to existing designated drainage features. Where necessary, the Applicant shall redesign and resize the existing drainage facilities to accommodate the potential increase in runoff along the rail alignment. The rail alignment shall connect with and mirror the existing culverts along the I-15 freeway. Where the rail alignment deviates from the I-15 freeway, the Applicant shall install culverts at natural drainage features.</p>

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	<p>However, the stations and maintenance facilities would have parking lots that could concentrate and redirect stormwater flows. In order to determine the adequate size of drainage facilities, the total increase in impervious surface of the design of the facilities shall be included in a Rational Method calculation (a way of calculating flow intensity) to determine the increase in peak storm discharges resulting from the</p>
<p><b><i>Hydrology and Water Quality, continued.</i></b></p>	
<p><i>Mitigation Measure HYD-5, continued.</i></p>	<p>Project. The 100-year, 24-hour storm event shall be used to determine the appropriate size of drainage facilities needed for the Project. Drainage facilities shall retain flows and not contribute to additional flows in the Mojave River or other streams and washes. This could be achieved with several detention basins. Drainage facilities for both the rail alignment and station and maintenance facilities will need to be sized accordingly to handle adequate flow. It is important to note that when a culvert is used, the footprint of the rail will need to be reinforced with rip-rap, and the culvert will need to be large enough to handle the 100-year 24-hour storm flow so on site flooding can be avoided. Other drainage features such as bridge crossings will need to be designed to not increase the size of the floodplain.</p> <p>The Applicant shall create either a new ephemeral drainage or restore, where feasible, through the reestablishment of former ephemeral drainages to compensate for temporary construction impacts to waters of the US.</p> <p>In addition to all the above mitigation measures, the Applicant shall also be required to comply with all conditions and mitigation requirements that result from the CWA Section 404 permit and Section 401 Certification.</p>
	<p>Mitigation Measure HYD-6: Reduce Encroachment into the 100-Year Floodplain</p> <p>When Project features are located within the 100-year floodplain, the Applicant shall elevate the base elevation of rail and stations, including maintenance facilities or relocate them within the facility footprint or APE to avoid any impact. Portions of the rail alignment may utilize track support columns that are located in the 100-year floodplain. Specific engineering plans and modeling, using Hydraulic Engineering Centers-River Analysis System (HEC-RAS), or similar, shall be completed by a registered professional during the design-build process. Design-build Project plans shall incorporate all feasible recommendations of the HEC-RAS analysis.</p>
	<p>Mitigation Measure HYD-7: No Storage of Construction Equipment or Materials within the 100-Year Floodplain</p> <p>The Applicant shall not store construction equipment or materials within the limits of influence that are located in areas of the 100-year floodplain so as to avoid redirecting 100-year flood flows that could cause</p>

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	structural damage or pose a safety risk to workers.
	Mitigation Measure HYD-8: Minimize Impact of OMSF 2 on Water Resources During the design-build process for Segment 1, the Victorville OMSF tracks and facilities shall be designed by the Applicant to avoid or bridge over the two small washes that feed into the Bell Mountain Wash.
<b><i>Hydrology and Water Quality, continued.</i></b>	
	Mitigation Measure HYD-9: Minimize Impacts of Autotransformers 7 and 11 on Water Resources During the design-build process for Segment 3, the Applicant shall locate autotransformers 7 and 11 within the limits of influence to avoid Telephone Wash and Kali Ditch, respectively, and to avoid other water resources.
	Mitigation Measure HYD-10: Minimize Impacts on Water Availability The Applicant shall obtain water from existing commercially available water sources during construction. The Applicant shall not develop new groundwater wells or surface water impoundments without subsequent environmental review as well as federal, state and local permits as appropriate and legally required.
<b>Geology and Soils</b>	
	Mitigation Measure GEO-1: Surface Fault Rupture For Segments 1, 2C, and 3B, as well as all stations and facilities associated with these segments, the Applicant shall conduct a site-specific, detailed evaluation, which includes surface reconnaissance and subsurface assessment, which shall be performed by a qualified geologist. The Applicant shall incorporate recommendations of this evaluation in design-build Project plans. This evaluation shall be performed prior to construction so that, in the event a fault-rupture hazard exists, the Applicant can implement recommendations of the geologist in the design-build Project plans.
	Mitigation Measure GEO-2: Ground Shaking For all rail alignments and all facilities, the Applicant shall conduct a site-specific evaluation of the potential ground shaking hazard, which shall be performed by a qualified geologist. The evaluation shall be performed during design development and prior to construction so that appropriate structural design and mitigation techniques can be incorporated into the design-build Project plans. Evaluation techniques shall include drilling of exploratory borings, laboratory testing of soils, computer software analysis to develop seismic design parameters for use by the Project structural engineer. Recommendations of this



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	evaluation that avoid or minimize impacts related to seismic ground shaking shall be incorporated into design-build Project plans. The Applicant shall design structural elements of the rail system to resist or accommodate appropriate site-specific ground motions and to conform to the current seismic design standards. The Applicant shall also implement an earthquake early warning system as part of the Project.
<b><i>Geology and Soils, continued.</i></b>	
	<p>Mitigation Measure GEO-3: Liquefaction</p> <p>For all rail alignments and all facilities, the Applicant shall conduct a site-specific evaluation of the potential liquefaction hazard, which shall be performed by a qualified geotechnical engineer during design development and prior to construction. This evaluation shall assess the liquefaction and dynamic settlement characteristics of the on-site soils and shall include drilling of exploratory borings, evaluation of groundwater depths, and laboratory testing of soils. The Applicant shall incorporate recommendations of this evaluation that avoid or minimize impacts related to liquefaction into design-build Project plans.</p>
	<p>Mitigation Measure GEO-4: Dam-Inundation</p> <p>For Segments 1, 2C, and 3B, as well as all stations and facilities associated with these segments, the Applicant shall prepare a detailed hydrologic evaluation during design development and prior to construction. The evaluation shall be prepared by a qualified hydrologist to assess the risks and potential effects of inundation on Project improvements. The hydrologic evaluation shall identify potential dam inundation hazards at site-specific locations and identify corresponding design recommendations to be incorporated into design-build Project plans.</p>
	<p>Mitigation Measure GEO-5: Settlement</p> <p>For all rail alignments and all facilities, the Applicant shall conduct site-specific geotechnical evaluations, which shall be performed by a qualified geologist during the preliminary design phase of the Project to assess the settlement potential of the on-site natural soils and undocumented fill. Surface reconnaissance and subsurface evaluation shall be performed which addresses the potential settlement hazards. The evaluations shall include drilling of exploratory borings and laboratory testing of soils, in addition to surface reconnaissance to evaluate site conditions. Before construction commences, the Applicant shall implement recommendations of the geotechnical evaluation into design-build Project plans.</p>
	<p>Mitigation Measure GEO-6: Corrosive Soils</p> <p>For all rail alignments and all facilities, the Applicant shall conduct subsurface evaluation for corrosive soils. Evaluation of corrosive soil potential shall be accomplished by testing and analysis of soils at</p>



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	design depths. Laboratory tests shall be conducted on the soils prior to construction and the results shall be reviewed by a qualified corrosion engineer. The qualified corrosion engineer shall prepare an improvement plan which shall include corrosion protection measures suitable to the Project elements.
<b>Geology and Soils, continued.</b>	
<i>Mitigation Measure GEO-6, continued.</i>	The improvement plan shall include corrosivity tests to evaluate the corrosivity of the subsurface soils. Before construction commences, the Applicant shall implement recommendations of the improvement plan into design-build Project plans.
	<p>Mitigation Measure GEO-7: Expansive Soils</p> <p>For all rail alignments and all facilities, the Applicant shall conduct site-specific subsurface evaluation(s), including laboratory testing to evaluate the extent of which expansive soils are present. The evaluations shall be performed by a qualified geologist. Where expansive soil conditions are found and would be detrimental to proposed improvements. Before construction commences, the Applicant shall implement measures recommended by the geologist into design-build Project plans.</p>
	<p>Mitigation Measure GEO-8: Landslides</p> <p>For all rail alignments and all facilities in California and the Segment 5 rail alignment in Nevada, the Applicant shall further evaluate the potential for landslides and surficial slope failures along the proposed segments by conducting surface reconnaissance and subsurface evaluation, which shall be performed by a qualified geotechnical engineer during Project design. Surface reconnaissance shall include visual observation of the earth units and geomorphology and review of geologic maps to evaluate the condition of slopes relative to the alignment. Subsurface exploration shall be performed as recommended by the qualified geotechnical engineer to evaluate the potential for landslides and surficial slope failures. If necessary, subsurface evaluation shall include the excavation and detailed logging of exploratory trenches, test pits and/or borings as recommended by the qualified geotechnical engineer. Slope stability computer analyses shall be performed to address the stability of slopes where recommended by the qualified geotechnical engineer. Before construction commences, the Applicant shall implement measures recommended in the evaluation into design-build Project plans.</p>
	<p>Mitigation Measure GEO-9: Caliche/Hard Rock Excavation</p> <p>For all rail alignments and all facilities, the Applicant shall conduct a surface reconnaissance and subsurface evaluation, which shall be performed by a qualified geotechnical engineer to assess soil excavability. This evaluation shall include drilling of exploratory borings and/or test pits to evaluate ground conditions for excavation capability where recommended by the qualified geotechnical engineer.</p>

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	Before construction commences, the Applicant shall implement measures recommended in the evaluation into design-build Project plans.
<i>Geology and Soils, continued.</i>	
	<p>Mitigation Measure GEO-10: Shallow Groundwater</p> <p>For all rail alignments and all facilities, the Applicant shall assess groundwater conditions in the Project area, which shall be performed by a qualified geotechnical engineer. Before construction commences, the Applicant shall implement measures recommended in the evaluation into design-build Project plans, so that in the event shallow groundwater is detected or suspected, appropriate mitigation techniques would be implemented.</p>
	<p>Mitigation Measure GEO-11: Tunneling</p> <p>For Segment 4C, the Applicant shall perform excavations for underground structures (tunnels) with care to reduce the potential for lateral deflection of excavation sidewalls and/or shoring, which could also cause differential movement of structures located near the excavation. To reduce the potential for damage to improvements and structures resulting from dewatering operations, the Applicant shall monitor the ground surface and/or structures around the excavation for movement with a variety of instrumentation. If during the course of construction, the instrumentation detects ground movement that exceeds a pre-specified value, the Applicant shall stop work and the contractor's methods shall be reviewed by a qualified geotechnical engineer and appropriate changes shall be made, if recommended by the geotechnical engineer. Typical monitoring methods include installation of ground survey points around the outside of the excavation to monitor settlement, placing monitoring points on nearby structures to monitor performance of the structures, and installation of inclinometers along the sides of the excavation to monitor lateral deflection of sidewalls.</p>
	<p>Mitigation Measure GEO-12: Ground Fissures</p> <p>For Segments 5B and 6B as well as all associated facilities, the Applicant shall engage a qualified geologist to conduct further evaluation for the potential for ground fissures. This evaluation shall include surface reconnaissance and visual observation of the earth units, manmade features and geomorphology, and review of geologic maps to evaluate the surface conditions relative to Project features. Before construction commences, the Applicant shall incorporate recommendations of the evaluation into design-build Project plans.</p>

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<b>Resource</b>	<b>Mitigation and Commitments</b>
<b>Hazardous Materials</b>	<p>Mitigation Measure HAZ-1: Structures Built Prior to 1980</p> <p>During the design-build process and prior to construction of Segment 6B and its related facilities, the Applicant shall conduct an evaluation of all buildings to be demolished to determine the presence of asbestos containing materials and lead based paint. Before demolition commences, the Applicant shall incorporate remediation consistent with the recommendations of these evaluations into design-build Project plans.</p> <p>Mitigation Measure HAZ-2: Contaminated Soil and/or Groundwater</p> <p>Prior to the start of demolition, grading, or construction, the Applicant shall prepare a soil monitoring plan and incorporate the recommendations of this plan into design-build Project plans for implementation during all phases of construction. Disturbed soils shall be monitored for visual evidence of contamination (e.g., staining or discoloration). The Applicant shall monitor soil for the presence of volatile organic compounds (VOC) using appropriate field instruments such as organic vapor measurement with photoionization detectors (PIDs) or flame ionization detectors. If the monitoring procedures indicate the possible presence of contaminated soil, a contaminated soil contingency plan shall be implemented that shall include procedures for segregation, sampling, and chemical analysis of soil. The Applicant shall profile contaminated soil for disposal and transport with appropriate hazardous or non-hazardous waste manifests by a state-certified hazardous material hauler to a state-certified disposal or recycling facility licensed to accept and treat the type of waste indicated by the profiling process. The Applicant shall develop and implement a contaminated soil contingency plan during all construction activities. In the unlikely event that these processes generate any contaminated groundwater that must be disposed of outside of the dewatering/ National Pollutant Discharge Elimination System (NPDES) process, the Applicant shall be profile, manifest, haul, and dispose of groundwater in the same manner.</p> <p>Where conditions warrant a Phase II Environmental Site Assessment (ESA), the Applicant shall include the following in the ESAs:</p> <ul style="list-style-type: none"><li>▪ A work plan that includes the numbers and locations of proposed soil borings/monitoring wells, sampling intervals, drilling and sampling methods, analytical methods, sampling rationale, site geohydrology, field screening methods, quality control/quality assurance, and reporting methods.</li><li>▪ A site-specific Health and Safety Plan (HSP) signed by a Certified Industrial Hygienist.</li><li>▪ Necessary permits for encroachment, boring completion, and well installation.</li><li>▪ A traffic safety plan.</li></ul>

**Appendix A: Mitigation and Commitments**

Resource	Mitigation and Commitments
<b><i>Hazardous Materials, continued.</i></b>	
<i>Mitigation Measure HAZ-2, continued.</i>	<ul style="list-style-type: none"> <li>▪ Sampling program (fieldwork) in accordance with the work plan and HSP. Fieldwork shall be completed under the supervision of a geologist registered in the State of California and/or Nevada, as appropriate.</li> <li>▪ Hazardous materials testing through a laboratory certified by California and/or Nevada.</li> <li>▪ Documentation to include field procedures, boring logs/well diagrams, tables of analytical results, cross-sections, an evaluation of the levels and extent of contaminants found, and conclusions and recommendations regarding the environmental condition of the site and the need for further assessment. Recommendations may include additional assessment or handling of the contaminants found through the contaminated soil contingency plan. If the contaminated soil contingency plan is inadequate for the contamination found, a remedial action plan shall be developed. Contaminated groundwater shall generally be handled through the NPDES/dewatering process.</li> <li>▪ Disposal process including transport by a state-certified hazardous material hauler to a state-certified disposal /recycling facility licensed to accept/treat the identified waste.</li> </ul> <p>Where contaminated groundwater is encountered, the Applicant shall obtain a NPDES permit prior to the issuance of a permit to construct. The NPDES permit shall specify site-specific testing and monitoring requirements and discharge limitations.</p> <p>Additionally, the Applicant shall review available agency files for moderate and high risk properties as identified in Final EIS Appendix F-K.1 prior to the commencement of demolition, grading, or construction. If the file review indicates a low likelihood of contaminants being present beneath or adjacent to a Project feature (rail alignment, station, maintenance facility, etc.), additional assessment/mitigation may not be recommended and the property could be reclassified as low risk.</p>
<p>Mitigation Measure HAZ-3: Previously Unidentified Hazardous Materials</p> <p>Prior to the start of construction activities, the Applicant shall prepare a hazardous materials contingency plan addressing the potential for discovery of unidentified underground storage tanks, hazardous materials, petroleum hydrocarbons, or hazardous or solid wastes during construction. This contingency plan shall address underground storage tank decommissioning, field screening, and materials testing methods, mitigation and contaminant management requirements, and health and safety requirements. The Applicant shall incorporate the recommendations of this plan into design-build Project plans.</p>	

**Appendix A: Mitigation and Commitments**

Resource	Mitigation and Commitments
<i>Hazardous Materials, continued.</i>	
	<p>Mitigation Measure HAZ-4: Hazardous Material Disposal</p> <p>The Applicant shall dispose of all hazardous or solid wastes and debris encountered or generated during construction and demolition activities in accordance with all applicable federal regulations.</p>
	<p>Mitigation Measure HAZ-5: Operational Generated Hazardous Materials</p> <p>The Applicant shall prepare a Hazardous Materials Management Plan for all facilities that use, store, or dispose of hazardous materials. Facilities emitting toxic air emissions shall submit inventories and plans to the appropriate air quality management district and be subject to permitting and monitoring regulations of the district. The Applicant shall obtain all necessary local, state and federal permits for the installation and operation of any above or below ground chemical or fuel storage tanks prior to installing such tanks.</p>
<b>Air Quality and Global Climate Change</b>	
	<p>Mitigation Measure AQ-1: Fugitive Dust Control Plan During Construction to Meet Mojave Desert Air Quality Management District (MDAQMD) Rule 403.2 Requirements</p> <p>Prior to the commencement of construction of all rail alignments and facilities within the State of California, the Applicant shall implement the following control measures consistent with the MDAQMD Rule 403.2 (Fugitive Dust Control for the Mojave Desert Planning Area), including recordation of all measures into design-build Project plans:</p> <ul style="list-style-type: none"> <li>▪ Use periodic watering for short-term stabilization of disturbed surface area to minimize visible fugitive dust emissions. Use of a water truck to maintain moist disturbed surfaces and actively spread water during visible dusting episodes shall be considered sufficient to maintain compliance;</li> <li>▪ Take actions sufficient to prevent Project-related trackout onto paved surfaces;</li> <li>▪ Cover loaded haul vehicles while operating on publicly maintained paved surfaces;</li> <li>▪ Stabilize graded site surfaces upon completion of grading when subsequent development is delayed or expected to be delayed more than 30 days, except when such a delay is due to precipitation that dampens the disturbed surface sufficiently to eliminate visible fugitive dust emissions;</li> <li>▪ Clean up Project-related trackout or spills on publicly maintained paved surfaces within 24 hours; and</li> </ul>

**Appendix A: Mitigation and Commitments**

Resource	Mitigation and Commitments
<b><i>Air Quality and Global Climate Change, continued.</i></b>	
<i>Mitigation Measure AQ-1, continued.</i>	<ul style="list-style-type: none"> <li>▪ Reduce nonessential earth-moving activity under high wind conditions. A reduction in earth-moving activity when visible dusting occurs from moist and dry surfaces due to wind erosion shall be considered sufficient to maintain compliance.</li> </ul>
	<p>Mitigation Measure AQ-3: Fugitive Dust Control Plan during Construction to Meet Clark County Department of Air Quality and Environmental Management (DAQEM) Requirements</p> <p>Prior to the commencement of construction of all rail alignments and facilities within the State of Nevada, consistent with Section 94 of Clark County Air Quality Guidelines, the Applicant shall compile a Dust Mitigation Plan that is consistent with measures identified in the DAQEM Construction Activities Dust Control Handbook (included by reference in Section 94 of the Clark County Air Quality Regulations) and Desert Tortoise protective measures, and a Dust Control Permit shall be secured from the DAEQM. The Dust Control Plan may include the following measures, among other measures, all of which shall be incorporated into design-build Project plans:</p> <ul style="list-style-type: none"> <li>▪ Use periodic watering for short-term stabilization of disturbed surface area to minimize visible fugitive dust emissions;</li> <li>▪ Take actions sufficient to prevent Project-related trackout onto paved surfaces;</li> <li>▪ Cover loaded haul vehicles while operating on publicly maintained paved surfaces;</li> <li>▪ Stabilize graded site surfaces upon completion of grading when subsequent development is delayed or expected to be delayed more than 30 days, except when such a delay is due to precipitation that dampens the disturbed surface sufficiently to eliminate visible fugitive dust emissions;</li> <li>▪ Clean up Project-related trackout or spills on publicly maintained paved surfaces within 24 hours; and</li> <li>▪ Reduce nonessential earth-moving activity under high wind conditions.</li> </ul>
	<p>Mitigation Measure AQ-5: Utilize additional means to reduce construction period emissions of air pollutants.</p> <p>The Applicant shall integrate the following control measures into design-build Project plans:</p> <ul style="list-style-type: none"> <li>▪ All off-road internal-combustion engine construction equipment shall be Tier-4 certified by the United States Environmental Protection Agency.</li> <li>▪ All signal boards shall be solar-powered.</li> </ul>

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Resource	Mitigation and Commitments
<b><i>Air Quality and Global Climate Change, continued.</i></b>	
<i>Mitigation Measure AQ-5, continued.</i>	<ul style="list-style-type: none"> <li>▪ All architectural coatings products shall contain no more than 250 grams of volatile organic compounds (VOC) per liter of coating (2.08 pounds per gallon).</li> <li>▪ For all work conducted within Clark County, only the following fuels shall be used to power off-road equipment:               <ul style="list-style-type: none"> <li>• A composite fuel blend consisting of at least 20 percent biodiesel.</li> </ul> </li> </ul>
<b>Noise and Vibration</b>	
	<p>Mitigation Measure NV-1: Noise Barriers</p> <p>The Applicant shall install noise barriers at least four feet in height along the at grade portions of the rail alignment and on the elevated structures to reduce severe noise impacts. The noise barriers shall be installed prior to the commencement of train operations along the rail alignment to reduce adverse noise effects.</p> <p>This is a common approach to reducing noise impacts from surface transportation sources. The primary requirements for an effective noise barrier are that (1) the barrier must be high enough and long enough to break the line-of-sight between the sound source and the receiver, (2) the barrier must be of an impervious material with a minimum surface density of four pounds per square foot and (3) the barrier must not have any gaps or holes between the panels or at the bottom. Because numerous materials meet these requirements, the selection of materials for noise barriers is usually dictated by aesthetics, durability, cost and maintenance considerations.</p> <p>The Applicant shall install noise barriers meeting the above criteria at the locations identified in the Final EIS (A list of these locations was provided as Final EIS Table F-3.12-5; an illustration of the locations of these barriers was provided in Final EIS Figures F-3.12-1 through F-3.12-3).</p>
	<p>Mitigation Measure NV-2: Location of Crossovers or Special Trackwork at Crossovers</p> <p>To reduce severe noise impacts, the Applicant shall locate crossovers away from residential areas where feasible, or use spring-rail or moveable point frogs in place of standard rigid frogs at turnouts where relocation of crossovers is not feasible. Because the impacts of wheels over rail gaps at track crossover locations, or turn-outs for passing tracks, increases vibration by about 6 dBA, crossovers are a major source of vibration noise impact when they are located in sensitive areas. If crossovers cannot be relocated away from residential areas, another approach is to use spring-rail or moveable point frogs in</p>



**Appendix A: Mitigation and Commitments**

<b>Resource</b>	<b>Mitigation and Commitments</b>
<b>Noise and Vibration, continued.</b>	
<i>Mitigation Measure NV-2, continued.</i>	place of standard rigid frogs at turnouts. These devices allow the flangeway gap to remain closed in the main traffic direction for revenue service trains. The Applicant shall incorporate these measures into design-build Project plans.
	<p><b>Mitigation Measure NV-3: Building Sound Insulation</b></p> <p>Where sensitive receptors would be dispersed or limited in nature, the Applicant may choose to install building sound insulation rather than implementing noise barriers defined under Mitigation Measure NV-1 to mitigate severe noise impacts. Sound insulation to improve the outdoor-to-indoor noise reduction has been widely applied around airports and has seen limited application for rail Projects. Although this approach has no effect on noise in exterior areas, it may be the best choice for sites where noise barriers are not feasible or desirable, and for buildings where indoor sensitivity is of most concern. Substantial improvements in building sound insulation (on the order of 5 to 10 dBA) can often be achieved by adding an extra layer of glazing to the windows, by sealing any holes in exterior surfaces that act as sound leaks, and by providing forced ventilation and air-conditioning so that windows do not need to be opened.</p>
	<p><b>Mitigation Measure NV-4: Property Acquisitions or Easements</b></p> <p>Where sensitive receptors would be dispersed or limited in nature, the Applicant may choose to implement property acquisitions or easements rather than Mitigation Measure NV-1 to mitigate severe noise impacts. The Applicant may purchase residences likely to be impacted by train operations or to acquire easements for such residences by paying the homeowners to accept the future train noise conditions. These approaches are usually taken only in isolated cases where other mitigation options are infeasible, impractical, or too costly.</p>
	<p><b>Mitigation Measure NV-10<sup>1</sup>: Construction Noise and Vibration Measures</b></p> <p>The Applicant shall develop specific residential property line noise limits that comply with applicable local noise regulations to the extent feasible during the design-build process, include these noise limits in the construction specifications for the Project, and perform noise monitoring during construction to verify</p>

<sup>1</sup> Note: Mitigation Measures NV-5 through NV-9, initially identified in the Draft EIS, applied only to a locomotive technology option (diesel-electric multiple unit or DEMU) that was not included in the Selected Alternative. Accordingly, mitigation specific to the DEMU technology is not included here.



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<b>Resource</b>	<b>Mitigation and Commitments</b>
<b>Noise and Vibration, continued.</b>	
<i>Mitigation Measure NV-10, continued.</i>	<p>compliance with the limits. This approach allows the contractor flexibility to meet the noise limits in the most efficient and cost-effective manner. Noise control measures that would be applied as needed to meet the noise limits include the following:</p> <ul style="list-style-type: none"> <li>▪ Avoiding nighttime construction in residential neighborhoods.</li> <li>▪ Using specially quieted equipment with enclosed engines and/or high-performance mufflers.</li> <li>▪ Locating stationary construction equipment as far as possible from noise-sensitive sites.</li> <li>▪ Constructing noise barriers, such as temporary walls or piles of excavated material, between noisy activities and noise-sensitive receivers.</li> <li>▪ Re-routing construction-related truck traffic along roadways that will cause the least disturbance to residents.</li> <li>▪ Avoiding impact pile driving near noise-sensitive areas, where possible. Drilled piles or the use of a sonic or vibratory pile driver are quieter alternatives where the geological conditions permit their use. If impact pile drivers must be used, their use will be limited to the periods between 8:00 AM and 5:00 PM on weekdays.</li> </ul> <p>With the incorporation of the appropriate noise mitigation measures, impacts from construction-generated noise should not be adverse. To provide added assurance, the Applicant shall institute a complaint resolution procedure to rapidly address any noise problems that may develop during construction.</p>
<b>Energy</b>	
None required.	
<b>Biological Resources</b>	
<u>Desert Tortoise-Specific Measures from the Biological Opinion</u>	
	<p>Mitigation Measure DT-1: Prior to the commencement of grading activities, the Applicant shall ensure all personnel working within the Project area attend an environmental awareness training program. The program will be presented by biologists authorized by the United States Fish and Wildlife Service (hereafter "authorized biologists") and include information on the life history of the desert tortoise, the legal protection it is afforded by the Endangered Species Act, the definition of take for listed species, measures to protect the desert tortoise, reporting requirements, specific measures that each worker will</p>



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<b>Resource</b>	<b>Mitigation and Commitments</b>
<b><i>Biological Resources, continued.</i></b>	
<i>Mitigation Measure DT-1, continued.</i>	need to employ to avoid adverse impacts on desert tortoises, a detailed description of environmental Project commitments as described in the decision records (i.e., record of decision), right-of-way grants, and biological opinion, and penalties for violation of federal and state environmental laws.
	Mitigation Measure DT-2: The Applicant shall ensure an authorized biologist will be on site during any construction activity within or near desert tortoise habitat to ensure the implementation and compliance of environmental commitments and avoidance measures.
	Mitigation Measure DT-3: The Applicant shall ensure the authorized biologists have the authority to stop work if dangers to desert tortoises arise, and to allow work to proceed after the hazard has been removed. The Applicant shall notify the Southern Nevada and Ventura United States Fish and Wildlife Offices, BLM Offices, and the California Department of Fish and Game of any desert tortoise injury or death resulting from Project-related activities.
	Mitigation Measure DT-4: The Applicant shall ensure, as part of the monitoring, that an authorized biologist checks construction areas immediately before construction activities each day to ensure that no desert tortoise has moved into the construction area. If desert tortoises are discovered within the construction area, the authorized biologist shall relocate the desert tortoises to adjacent habitat approximately 300 feet from the limit of disturbance (i.e., beyond the 162.5-foot temporary construction area).
	Mitigation Measure DT-5: The Applicant will ensure the authorized biologists properly implement protective measures, records and reports desert tortoise and sign observations in accordance with approved protocol, reports incidents of noncompliance in accordance with the biological opinion and other relevant permits and authorizations, and moves desert tortoises from harm's way and place these animals in adjacent habitat approximately 300 feet of the limit of disturbance.
	Mitigation Measure DT-6: The Applicant shall confine all construction activities to the designated work areas. Grubbing of vegetation will only be done to the extent necessary for construction and will be limited to areas designated for that. Overnight parking and storage of equipment and materials will be limited to previously disturbed areas or areas identified in the BLM right-of-way grant.
	Mitigation Measure DT-7: The Applicant shall restrict all vehicle traffic to existing paved roads and the Project alignment within the permanent or temporary construction area. Disturbance beyond the construction area would be prohibited except in emergency situations.

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<b>Resource</b>	<b>Mitigation and Commitments</b>
<i>Biological Resources, continued.</i>	
	Mitigation Measure DT-8: The Applicant shall not allow speeds in excess of 15 miles per hour for construction vehicles within sensitive species habitat.
	Mitigation Measure DT-9: The Applicant shall implement a litter-control program during construction. The program will include the use of covered, common raven-proof trash receptacles, daily removal of trash from work areas to the trash receptacles, and proper disposal of trash in a designated solid waste disposal facility. Precautions will also be taken to prevent trash from blowing out of construction vehicles.
	Mitigation Measure DT-10: The Applicant will promptly remove all road-killed animals within the Project construction area and the permanent rail alignment to reduce the adverse effects associated with predation of desert tortoise by common ravens ( <i>Corvus corax</i> ).
	Mitigation Measure DT-11: The Applicant will not permit pets or firearms in the work area.
	Mitigation Measure DT-12: The Applicant shall take both pre- and post-construction photographs to document sensitive habitat conditions within the limits of Project disturbance.
	Mitigation Measure DT-13: During construction, the Applicant will perform weekly inspections and weed removal/control during the growing season of all construction areas, rail alignment, and facilities. Following the completion of construction activities, from March through August, the Applicant will continue monitoring and removal monthly during the first 2 years of operation and quarterly for the life of the facility. Weed removal and control will consist of physical control methods (e.g., hand pulling, hoeing, etc.) or herbicide application. A provision of this measure requires preparation of an invasive weed monitoring and treatment plan that would be applicable to all lands affected by the proposed action. This weed control plan will be developed in cooperation with FRA and BLM to ensure that weed control and removal activities do not affect desert tortoises. The use of herbicides to control weeds within the Project construction and operation area will be coordinated with biologists of the BLM, the California Department of Fish and Game, and the Nevada Department of Wildlife to ensure the application does not affect desert tortoises. In instances where desert tortoises may come into contact with herbicide, the plan will require manual removal of individual plants. The FRA will ensure the same methods and caution will occur on lands within the action area that are outside of those managed by the BLM.

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<b>Resource</b>	<b>Mitigation and Commitments</b>
<i>Biological Resources, continued.</i>	
	<p>Mitigation Measure DT-14: The Applicant shall develop and implement a vegetation and topsoil removal and restoration plan to reduce impacts on biological resources. The plan shall include a requirement for the Applicant to remove and stockpile construction area topsoil prior to initiating construction and replaced within areas of temporary disturbance once construction is complete. Any permanent topsoil stabilization measures will be constructed and maintained within the permanent right-of-way. These measures may include, but are not limited to, the use of geo-textile mats or rip-rap to in areas of high erosion potential.</p>
	<p>Mitigation Measure DT-15: The Applicant shall install and maintain rice wattles, straw wattles, and silt fencing along all construction areas to prevent sediment from being transported off of the right-of-way during construction. The Applicant shall employ permanent stabilization measures upon completion of construction along washes and in other areas of potential erosion.</p>
	<p>Mitigation Measure DT-16: To minimize adverse effects to the desert tortoise, the Applicant will fence the boundary of the Victorville Passenger Station and the Victorville OMSF with permanent desert tortoise exclusion fencing. The Applicant shall install desert tortoise guards at gated entries to prevent desert tortoises from gaining entry to the Project sites. The Applicant shall also fence the TCAs, the Baker MOW facility, autotransformers sites and substations, the construction areas for the utility corridors, and the rail alignment's temporary construction area, with temporary desert tortoise fencing prior to clearance surveys and ground disturbance. Proposed construction sites along the alignment that are not located in desert tortoise habitat (i.e., within Barstow, Baker, and Las Vegas) will not be fenced.</p>
	<p>Mitigation Measure DT-17: To ensure the clearance of all desert tortoises from all potential habitat areas, the Applicant shall conduct clearance surveys using service-authorized desert tortoise biologists as required by the Service.</p>
	<p>Mitigation Measure DT-18: The Applicant shall include the installation of temporary desert tortoise fencing around the perimeter prior to the commencement of on-site construction as part of desert tortoise relocation from the Project area. Installation of the fencing will be monitored by an authorized biologist to ensure that desert tortoises are not killed or injured during this activity. Temporary desert tortoise fencing will be installed in areas of construction that are beyond the perimeter of the right-of-way or in areas where construction staging will occur. Desert tortoise guards will be installed at construction area entry points and permanent rail alignment maintenance access points. After installation, the fence will be regularly inspected to ensure its integrity. The Applicant will ensure that cross-country travel for</p>

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<b>Resource</b>	<b>Mitigation and Commitments</b>
	construction purposes outside of the areas of desert tortoise fencing is prohibited.
<i>Biological Resources, continued.</i>	
	<p>Mitigation Measure DT-19: In areas where high vehicular construction traffic is expected (such as TCAs), desert tortoise exclusionary fencing may require the supplemental use of a desert tortoise guard. Locations of such guards will be determined by an authorized biologist. This device resembles a cattle guard and is positioned at ground level and connected to the exclusionary fencing to prohibit desert tortoise from crossing into the construction area but allowing the passage of construction vehicles. The guard would be maintained throughout its use during the construction process by the Applicant. Such maintenance would require the presence of an authorized desert tortoise biologist. The guard would have a clear escape route away from construction activity for any desert tortoise that should fall into the guard. The guard would be inspected daily for desert tortoise and to ensure the escape route is free of obstruction. The guard would also be cleared of debris that may allow desert tortoise passage across the guard and into a construction area.</p>
	<p>Mitigation Measure DT-20: The Applicant shall ensure only biologists authorized by the Service will handle desert tortoises and follow the guidelines within the Desert Tortoise Field Manual. Desert tortoises found within the Project area will be removed and relocated to undisturbed suitable habitat beyond the construction site and within their own territory, where they may be familiar with alternate burrows. If no burrows are available, the Applicant shall create artificial burrows following the guidelines within the Desert Tortoise Field Manual.</p>
	<p>Mitigation Measure DT-21: After installation of the temporary fencing, the Applicant shall survey the entire Project area for desert tortoises. The survey shall be conducted by an authorized biologist. Following the procedures and precautions outlined in the Desert Tortoise Field Manual, all desert tortoise pallets and burrows within the survey areas will be examined and excavated by hand, either by or under the direct supervision of an authorized biologist, and collapsed to prevent re-entry.</p>

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<b>Resource</b>	<b>Mitigation and Commitments</b>
	<p>Mitigation Measure DT-22: The Applicant shall ensure an authorized biologist will be present during all initial top soil removal, blading, or grading activities within the Project area. During Project implementation, the Applicant shall ensure all workers will inform the authorized biologist if a desert tortoise is found within or near Project areas. All work in the vicinity of the desert tortoise, which could injure or kill the animal, will cease and it will be observed until it is moved from harm's way by the authorized biologist.</p>
<b><i>Biological Resources, continued.</i></b>	
	<p>Mitigation Measure DT-23: Workers will inspect for desert tortoises under vehicles and equipment before such equipment is moved. If a desert tortoise is present, the worker will wait for it to move out from underneath the vehicle or the authorized biologist will be contacted to remove it.</p>
	<p>Mitigation Measure DT-24: The Applicant will replace any previously installed permanent desert tortoise exclusionary fencing along Interstate 15 that is removed during Project construction.</p>
	<p>Mitigation Measure DT-25: The Applicant shall implement minimization measures for potential impacts to downstream habitat from Segment 4C (if constructed), which may include the use of tunnels, aerial crossing structures, at-grade overcrossing structures, and culverts. At a minimum, the Applicant shall avoid all ephemeral drainages equal to or greater than 4 feet wide with these types of structures. Where tunnels and aerial crossing structures would be used, drainages less than 4 feet in width would also be avoided. If support piles or piers are necessary to support over crossing structures these structures would be located outside of the drainage being over crossed. Authorized biologists would be present during construction to ensure impacts to drainages are avoided or, where an impact is unavoidable, ensure the impact is minimized and the natural substrate of the drainage that has been disturbed is re-established to original grade and with natural substrate materials within the drainage channel. In addition to the ephemeral drainages over crossed, drainages established (created) or re-established as part of the Project's compensatory mitigation for replacement of affected waters of the United States or State of California would be monitored by an agency-approved biologist for a minimum of 5 years to ensure that agency-approved performance standards are met.</p>

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<b>Resource</b>	<b>Mitigation and Commitments</b>
	<p>Mitigation Measure DT-26: In addition to habitat restoration, the Applicant will compensate for habitat disturbance through payment of a per-acre fee for disturbance of desert tortoise habitat in California and Nevada. These funds will be paid to the BLM and used for management actions expected to provide a benefit to the desert tortoise over time. Actions may involve habitat acquisition, population or habitat enhancement, increasing knowledge of the species' biological requirements, reducing loss of individual animals, documenting the species' current status and trends, and preserving distinct population attributes. Specific actions to be funded will be determined during annual meetings between the BLM and the United States Fish and Wildlife Service to identify and prioritize management actions, which may include implementation of range wide monitoring of desert tortoises.</p>
<b><i>Biological Resources, continued.</i></b>	
<u>Terms and Conditions of the Biological Opinion Specific to Desert Tortoise</u>	
	<p>Mitigation Measure DT-27: To ensure that the measures proposed by the FRA and the Applicant are effective and are being properly implemented, the FRA or the Applicant must contact the United States Fish and Wildlife Service (USFWS) immediately if it becomes aware that a desert tortoise has been killed or injured by Project activities. At that time, the Applicant, in coordination with the FRA, must review the circumstances surrounding the incident with the USFWS to determine whether additional protective measures are required. Project activities may continue during the review, provided that the proposed protective measures in the Project description and any appropriate terms and conditions of this biological opinion have been and continue to be fully implemented.</p> <p>If five desert tortoises are injured or killed as a result of construction of the Project, the FRA shall re-initiate consultation on the Project, pursuant to the implementing regulations for section 7(a)(2) of the Endangered Species Act at 50 Code of Federal Regulations 402.16.</p>
	<p>Mitigation Measure DT-28: If two desert tortoises are injured or killed as a result of operation and maintenance of the Project in any calendar year, the FRA shall re-initiate consultation on the Project, pursuant to the implementing regulations for section 7(a)(2) of the Endangered Species Act at 50 Code of Federal Regulations 402.16.</p>
	<p>Mitigation Measure DT-29: The Applicant shall monitor, during construction and operation, the integrity of all desert tortoise exclusion fencing on a regular basis and following any rain events that result in surface flow of water in washes within the action area.</p>
	<p>Mitigation Measure DT-30: The Applicant shall use culverts that allow effective passage of desert tortoises but are large enough that desert tortoises are unlikely to use the culverts as burrows. The United</p>





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Resource	Mitigation and Commitments
	<p>States Fish and Wildlife Service has estimated that any box culvert must be 3 feet on a side and pipe culverts 3 feet in diameter and recommends that box culverts be used because desert tortoises are less likely to use them as burrows. At a minimum, culverts would need to be large enough. The Applicant shall ensure regular maintenance of the culverts so desert tortoises do not use accumulated debris to construct burrows. If a culvert under the rail line is tied to an existing culvert under Interstate 15 or the Union Pacific Railroad, the Applicant, with approval from the FRA, may forego these specifications if they are incompatible with the existing culverts.</p>
	<p>Mitigation Measure DT-31: The Applicant shall use culverts that will not entrap desert tortoises or block their passage. Specifically, all erosion control devices must be constructed and maintained in a manner that allows desert tortoises to enter and leave them freely.</p>
<p><b><i>Biological Resources, continued.</i></b></p>	
	<p>Mitigation Measure DT-32: The Applicant shall install a sufficient number of culverts in Segment 2C where it deviates from Interstate 15 (excluding on the dry lake bed), to ensure any desert tortoise whose home range occurs across the action area could continue to access both sides easily. In general, the distance between culverts must be no greater than 0.25 mile unless topography is an obstacle.</p>
	<p>Mitigation Measure DT-33: The Applicant shall ensure authorized biologists survey areas that could become isolated from the main body of habitat where the alignment deviates slightly from the freeway (e.g., at off-ramps). If desert tortoises are present and construction of the Project may disrupt their behavior or if a culvert or other access to the main body of habitat does not exist or will not be provided, the authorized biologist must relocate them to the side of the rail line that is adjacent to the main body of habitat. In any event of uncertainty, the authorized biologist must contact the Service for guidance prior to moving the desert tortoise; during this time, the authorized biologist may install fencing around the area of the desert tortoise's burrow so he or she may find it again.</p>
	<p>Mitigation Measure DT-34: The Applicant shall design all new utility lines and ancillary structures associated with the Project in a manner that will reduce the likelihood of nesting by common ravens. The Applicant, as appropriate, must monitor these utility lines and ancillary structures to ensure the effectiveness of their measures and implement adaptive management, in coordination with the Service, if the initial measures are unsuccessful. The Applicant must ensure that any common ravens nests established on new utility lines and ancillary structures are removed within one year at a time when they are inactive.</p>
	<p>Mitigation Measure DT-35: During construction of the Segment 4C rail line (if constructed), if desert</p>

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	tortoises that have been translocated from the Ivanpah solar plant site need to be moved from harm's way, the Applicant shall coordinate their capture and movement with the BLM to ensure that the health and welfare of these animals is not compromised. Prior to the onset of construction, the Applicant must contact the BLM to establish appropriate protocols to follow in the event these animals are encountered.
	Mitigation Measure DT-36: By January 31 of any year the proposed action is under construction and during its operation, the FRA must provide a report to the United States Fish and Wildlife Service (USFWS) that provides details on the effects of the action on the desert tortoise. Within 60 days of the completion of the proposed action, the FRA must provide a summary report that provides, in addition to the following information, a complete overview of the amount of habitat disturbed and the number of desert tortoises that were taken. The Applicant shall furnish all of these reports to the FRA no less than 15 days prior to the required USFWS submittal. These reports shall include information on any instances
<b><i>Biological Resources, continued.</i></b>	
<i>Mitigation Measure DT-36, continued.</i>	when desert tortoises were killed, injured, or handled, the circumstances of such incidents, and any actions undertaken to prevent similar instances from re-occurring. In addition, the reports should include any recommendations that would facilitate the implementation of the protective measures while maintaining protection of the desert tortoise and the names of any monitors who assisted the authorized biologist and an evaluation of the experience they gained on the Project.
	Mitigation Measure DT-37: Within 3 days of locating any dead or injured desert tortoises, the Applicant, in coordination with the FRA, shall notify the Ventura Office of the United States Fish and Wildlife Service by telephone (805 644-1766) and by facsimile (805 644-3958) or electronic mail. The report must include the date, time, and location of the carcass, a photograph, cause of death, if known, and any other pertinent information.
	Mitigation Measure DT-38: The Applicant shall take care in handling dead desert tortoises to preserve biological material in the best possible state for later analysis. If desert tortoises are killed by Project activities, the United States Fish and Wildlife Service will instruct the Applicant regarding the final disposition of the carcass.
<u>General Mitigation Measures</u>	
	Mitigation Measure BIO-1: Conduct Mandatory Environmental Awareness Training Program The Applicant shall ensure all personnel working within the Project area attend an environmental awareness training program. The program shall be presented by authorized biologists and include



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	<p>information on the life history of special-status species that may be encountered during construction activities, the legal protection for each species, the definition of “take” for listed species, measures to protect special-status species, reporting requirements, specific measures that each worker shall need to employ to avoid adverse effects to individual sensitive species, a detailed description of environmental Project commitments as described in the decision records (i.e. Record of Decision), right-of-way grants, and Biological Opinion, and penalties for violation of federal and state environmental laws.</p>
	<p>Mitigation Measure BIO-2: Conduct Preconstruction Surveys and Install Environmental Fencing            The Applicant shall undertake preconstruction surveys for special-status species; these surveys shall be conducted by qualified biologists (ie, one or more third party contractor(s) approved by the the United States Fish and Wildlife Service (USFWS)) prior to the start of construction. Preconstruction surveys shall be tailored for specific species based on the species biology, natural history, and regulatory</p>
<b><i>Biological Resources, continued.</i></b>	
<i>Mitigation Measure BIO-2, continued.</i>	<p>requirements. The locations for any individual or population of sensitive species within the limit of disturbance shall be documented with a GPS unit and reported to the state and federal regulatory agencies.</p> <p>Mohave ground squirrel surveys are only valid for 12 months. Therefore, they shall be done no more than 12 months prior to the start of construction in a particular area. If no Mohave ground squirrels are found during the surveys, no additional mitigation would be required.</p> <p>Mojave fringe-toed lizard surveys shall occur no more than 24 hours prior to the start of construction. Surveys shall be conducted within the work area and a 100-foot buffer. Any Mojave fringe-toed lizards observed in the work area shall be allowed to move out of the work area. Those that become trapped in the work area shall be captured and moved to nearby suitable habitat outside of the work area.</p> <p>Qualified biologists shall conduct preconstruction surveys for banded gila monsters no more than 24 hours prior to the start of construction within all suitable habitat in Segments 3 and 4. Surveys shall be conducted within the work area and a 100-foot buffer. Any gila monsters observed within the work areas shall be allowed to move out of the work area and those that become trapped within the work area shall be carefully moved to nearby suitable habitat. The handler shall have the necessary permit from the California Department of Fish and Game (CDFG) to handle and move lizards.</p> <p>Qualified biologists shall conduct preconstruction surveys for BLM-sensitive and Clark County multiple-species habitat conservation plan (MSHCP) covered reptile species no more than 48 hours prior to the start of construction. Surveys shall be conducted within the work area and include a 100-foot buffer. Any</p>

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	<p>sensitive reptile species observed within the work areas shall be allowed to move out of the work area and those that become trapped within the work area shall be very carefully moved to nearby suitable habitat.</p> <p>The Applicant shall implement the following measures, to avoid disturbance of tree, shrub- or ground-nesting special-status and migratory birds and raptors:</p> <ul style="list-style-type: none"><li>▪ If construction activities are scheduled to occur during the breeding season (generally between March 1 and August 15), a qualified wildlife biologist shall conduct focused nesting surveys within the appropriate habitat and an appropriate buffer distance up to 0.25 mile from the limit of Project disturbance for nesting raptors.</li><li>▪ The focused surveys shall include tree- and shrub-nesting birds, ground-nesting birds, and cliff-nesting birds. The surveys shall be conducted within the two-week period before initiation of construction activities in a particular area between March 1 and August 15. If no active nests are detected, then no additional mitigation would be required.</li></ul>
<b>Biological Resources, continued.</b>	
<i>Mitigation Measure BIO-2, continued.</i>	<ul style="list-style-type: none"><li>▪ Follow-up surveys shall be required on a monthly basis during the breeding season. If surveys indicate that active nests are present in any areas that would be directly affected by construction activities, a no-disturbance buffer would be established around the site to avoid disturbance or destruction of the nest site until after a wildlife biologist determines that the young have fledged (usually late June to mid-July). The extent of these buffers shall be determined by a wildlife biologist in consultation with the California Department of Fish and Game (CDFG) in California and the Nevada Department of Wildlife (NDOW) in Nevada and will depend on the level of noise or construction disturbance, line of sight between the nest and the disturbance, ambient levels of noise and other disturbances, and other topographical or artificial barriers. These factors shall be analyzed to make an appropriate decision on buffer distances.</li></ul> <p>A qualified biologist shall conduct preconstruction surveys for active burrows according to CDFG guidelines for burrowing owl (1993 and 1995). The preconstruction surveys shall be conducted by a qualified biologist within the work area and include a 250-foot buffer and within the 2-week period before initiation of construction activities to locate active burrowing owl burrows. The preconstruction surveys shall include a nesting season survey and a wintering season survey the season immediately preceding construction. If no burrowing owls are detected, no further mitigation would be required.</p> <p>Focused surveys for the presence of sensitive bat species shall be conducted in areas that provide suitable roosting or nursery habitat. If a roosting site is active and cannot be avoided, the Applicant shall</p>

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	<p>consult with a bat expert in conjunction with the CDFG in California and the NDOW in Nevada to develop appropriate exclusion methods. If it is determined that a nursery sites is active and cannot be avoided, construction activities that would disturb the nursing bats shall be delayed until the breeding cycles for the bats are completed. The Applicant shall consult with a bat specialist in order to determine when the breeding cycle for bats. The Applicant shall document the results of any exclusion or avoidance of roosting/nursery sites for bats.</p> <p>Qualified biologists shall conduct preconstruction surveys for American badger no more than 48 hours prior to the start of construction. Surveys shall be conducted within the work area and a 100-foot buffer. Any American badgers observed in the work area shall be allowed to leave the work area.</p> <p>Construction activities conducted within suitable desert bighorn sheep habitat in the Mountain Pass area of the Project shall not occur during the period of the year when desert bighorn sheep are lambing (from January 1 to April 30). If construction activities must occur during the desert bighorn sheep lambing</p>

***Biological Resources, continued.***

<p><i>Mitigation Measure BIO-2, continued.</i></p>	<p>period, pre-construction surveys for lambing desert bighorn sheep shall be conducted prior to construction. If lambing desert bighorn sheep are found, then the Applicant shall consult with the BLM and the CDFG to identify appropriate avoidance measures.</p> <p>Qualified botanists shall conduct preconstruction surveys for sensitive botanical species and invasive, non-native weed species prior to initiating construction of the Project. If sensitive botanical species are observed within the temporary construction area of effect, avoidance and minimization measures shall be applied by the Applicant.</p> <p>Temporary environmental fencing shall be installed around sensitive biological resources prior to the commencement of on-site Project construction in order to avoid unnecessary adverse effects to the resource. USFWS- and BLM-approved desert tortoise exclusionary fencing shall be erected by an authorized biologist within portions of the Project that occur in desert tortoise habitat. Temporary desert tortoise fencing shall be installed in areas of construction that are beyond the perimeter of the right-of-way or in areas where construction staging would occur. This includes fencing all work areas, temporary equipment and vehicle yards, and material staging and storage areas. Desert tortoise exclusionary fencing and clearance surveys shall be undertaken no more than 10 days prior to initiating construction activities. After installation of the temporary fencing, the entire Project area shall be surveyed for desert tortoises by an authorized biologist. Following the procedures and precautions outlined in the Desert Tortoise Council's guidelines, all desert tortoise pallets and burrows within the survey areas shall be examined and excavated by hand, either by or under the direct supervision of an authorized biologist, and</p>
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	<p>unoccupied features collapsed to prevent re-entry. After installation, the fence shall be regularly inspected to ensure its integrity. Desert tortoise encountered during preconstruction surveys shall be relocated off the Project ROW based on a USFWS, BLM, and CDFG-approved Project-specific Desert Tortoise Relocation Plan. At a minimum the Desert Tortoise Relocation Plan shall require the desert tortoises found within the Project area be removed to undisturbed areas beyond the construction site and relocated within their own territory where they may be familiar with alternate burrows. If no natural burrows are available, artificial burrows shall be created following the Desert Tortoise Council's guidelines. Only biologists authorized by the USFWS shall handle desert tortoises and shall follow the guidelines established by the Desert Tortoise Council.</p> <p>The Applicant shall install and maintain permanent exclusionary fencing along the open portion of the rail alignment in areas of suitable bighorn sheep habitat. The fencing shall be constructed to ensure that bighorn sheep cannot access the rails or any culverts/tunnels. In addition, prior to initiating construction,</p>
<b>Biological Resources, continued.</b>	
<i>Mitigation Measure BIO-2, continued.</i>	<p>temporary exclusionary fencing shall be placed around all sensitive botanical species that occur within the temporary construction areas. These areas shall be signed for avoidance by construction equipment and personnel.</p>
	<p>Mitigation Measure BIO-3: Conduct Construction Monitoring</p> <p>The Applicant shall implement the following measures during Project construction:</p> <ul style="list-style-type: none"> <li>▪ Qualified biologists shall be on site during any construction activity within or near special-status species habitat to ensure the implementation and compliance of environmental commitments and avoidance measures.</li> <li>▪ The qualified biologist shall have the authority to stop work if dangers to desert tortoises or other special-status wildlife species arise and allow work to proceed after the hazard has been removed. The United States Fish and Wildlife Service (USFWS) Southern Nevada and Ventura Ecological Services Offices, BLM Field Offices and the California Department of Fish and Game (CDFG) must be notified of any desert tortoise injury or death resulting from Project-related activities. In addition, the USFWS Division of Law Enforcement shall also be notified in accordance with reporting requirements.</li> <li>▪ As part of the monitoring, the biologists shall check construction areas immediately before construction activities each day to ensure that no special-status wildlife species have moved into the construction area. If tortoises are discovered within the construction area they shall be</li> </ul>

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	<p>relocated by an authorized biologist based on the Desert Tortoise Relocation Plan.</p> <ul style="list-style-type: none"> <li>▪ All construction activities shall be confined to the designated work areas. Grubbing of vegetation shall only be to the extent necessary for construction and shall be limited to areas designated for that. An authorized biologist(s) shall be present during all initial brushing or grading activities within the Project area. Overnight parking and storage of equipment and materials would be limited to previously disturbed areas or areas identified in the BLM right-of-way grant.</li> <li>▪ All vehicle traffic shall be restricted to existing roads or land management agency approved newly constructed roads. The Applicant shall ensure that cross-country travel for construction purposes outside of the areas of desert tortoise fencing is prohibited.</li> <li>▪ Construction vehicles within sensitive species habitat shall not exceed 15 miles per hour.</li> </ul>
<b>Biological Resources, continued.</b>	
<i>Mitigation Measure BIO-3, continued.</i>	<ul style="list-style-type: none"> <li>▪ A litter-control program shall be implemented during construction. The program shall include the use of covered, raven-proof trash receptacles, daily removal of trash from work areas to the trash receptacles, and proper disposal of trash in a designated solid waste disposal facility. Precautions shall also be taken to prevent trash from blowing out of construction vehicles.</li> <li>▪ No pets or firearms shall be permitted in the work area.</li> <li>▪ Both pre- and post-construction photographs shall be taken to document sensitive habitat conditions within the limits of Project disturbance.</li> </ul>
	<p>Mitigation Measure BIO-4: Avoid the Dispersal of Invasive, Non-Native Weed Species into Uninfested Areas</p> <p>To avoid the introduction or spread of invasive, non-native weed species into uninfested areas, the Applicant shall incorporate the following measures into the Project plans and specifications:</p> <ul style="list-style-type: none"> <li>▪ Use only certified, weed-free, imported erosion-control materials (or rice straw in upland areas).</li> <li>▪ Coordinate with BLM field offices and the NPS to ensure that the appropriate best management practices (BMPs) are implemented.</li> <li>▪ Educate construction supervisors and managers on weed identification and the importance of controlling and preventing the spread of invasive, non-native weed species.</li> <li>▪ Clean equipment at designated wash stations before and after entering the Project construction area.</li> <li>▪ An invasive, non-native weed species survey of the Project right-of-way, including temporary</li> </ul>

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	<p>work areas, shall be completed prior to initiating Project construction. All areas disturbed by the Project shall be surveyed using approximately 30-foot meandering transects. Populations of invasive, non-native weed species shall be identified and mapped using global positioning systems (GPS).</p> <ul style="list-style-type: none"> <li>▪ Develop an approved Invasive Weed Species Monitoring and Treatment Plan to detect and treat any noxious invasive, non-native weed species in the construction area. The plan shall include methods for monitoring, treating and reporting invasive, non-native weed species infestations within the construction area. The Invasive Weed Species Monitoring and Treatment Plan shall be drafted and submitted to the BLM prior to initiating construction as part of the BLM ROW grant requirements.</li> </ul>

***Biological Resources, continued.***

	<p>Mitigation Measures BIO-5: Confine Construction Equipment to a Designated Work Zone (Including Access Roads) at Each Project Site</p> <p>The Applicant shall, clearly stake and flag the work zone prior to construction. During the environmental training program, construction personnel shall be informed about the importance of avoiding ground-disturbing activities outside the designated work area. During construction, the construction monitors and resource monitors shall ensure that construction equipment and associated activities avoid any disturbance of native vegetation and sensitive resources outside the designated work zones. Contaminant run-off shall be contained within the temporary construction boundaries and clean-up efforts shall be initiated immediately. Clean-up procedures shall be coordinated with the responsible agency to insure additional resource damage does not occur.</p>
	<p>Mitigation Measure BIO-6: Reestablish Preconstruction Site Conditions to Allow Revegetation</p> <p>The Applicant shall restore disturbed areas of native vegetation to preconstruction site conditions. To ensure that effects on native plant species and communities are not long-term, the Applicant shall stockpile and immediately replace native topsoil within the Project right-of-way, and reestablish natural site topography (including necessary amendments to soil structure) to allow natural colonization of plant species.</p> <p>In both California and Nevada, the Applicant shall relocate all succulents within the limits of disturbance to undeveloped BLM-administered public lands or maintain them within a temporary nursery (located within the right-of-way) and replant within the ROW as part of site restoration activities.</p> <p>In areas that require immediate stabilization, non-vegetative techniques that allow native species to</p>



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	<p>reestablish can be used, including use of weed- and disease-free mulch, erosion blankets, or rolled organic fiber material.</p> <p>Erosion control seed mixes may be necessary on selected sites. If sites need to be stabilized through seeding, the seed mix would be composed entirely of native and locally occurring species appropriate for stabilizing local site conditions. All seed mixes shall be approved by the BLM, NPS, and CDFG prior to initiating restoration activities. Special attention shall be given to erosion control near ephemeral drainages and within playas.</p> <p>The Applicant shall determine site-specific erosion control measures (non-vegetation or mechanical techniques) in consultation with a vegetation specialist and Project engineer.</p>
<i>Biological Resources, continued.</i>	
	<p><b>Mitigation Measure BIO-7: Retain and Stockpile Topsoil</b></p> <p>The Applicant shall remove native topsoil from areas of permanent disturbance and stockpile within the right-of-way. To avoid altering local hydrologic conditions or flood flows, spoils materials shall not be placed in sensitive habitat areas or within or adjacent to ephemeral drainages. Prior to disturbance, native topsoil shall be excavated and stockpiled for later reapplication in native vegetation areas. Separate stockpiling areas shall be identified and clearly marked for each different vegetation type as appropriate. The exact depths shall be determined for each native vegetation type and depend upon the stratigraphy and soil profiles (estimated to be 6-12 inches in depth). The excavated soil depths shall exceed the restored soil depths to allow for soil compaction during placement. The stockpiled soil shall not be covered to minimize damage to propagation material from heated soil conditions but it shall be protected from construction activity and signed to identify it as a protected resource.</p>
	<p><b>Mitigation Measure BIO-8: Restore Natural Site Topography</b></p> <p>The Applicant shall be responsible for restoring the natural site topography to pre-Project contours. The restored topography shall mimic the pre-Project condition to the greatest extent possible. Minor modifications may be required to conform with post-Project site condition. Construction area soil compaction shall be treated using grubbing, raking, and other BLM-approved soil decompaction techniques as part of the Project restoration. Proper compaction of the subsurface material and plow furrows is necessary to help prevent surface and subsurface migration of water along the plow or trench furrow, and to prevent trench settlement. The reapplied topsoil in the right-of-way shall be left in roughened condition to facilitate the establishment of vegetation and reduce the potential for erosion. Excessive passes of finish grading equipment that would compact topsoil shall be avoided. Upon completion of the grading operations, no further vehicular traffic shall be allowed, other than necessary</p>

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	mitigation planting equipment.
	<p>Mitigation Measure BIO-9: Implement Erosion Control Measures as Appropriate</p> <p>The Applicant shall prepare and implement an erosion control and restoration plan to control short-term and long-term erosion and sedimentation effects and to restore soils and native vegetation in areas affected by construction activities. The plan shall include requirements of applicable erosion control ordinances and grading permits and shall implement best management practices (BMPs) for erosion and sediment control as necessary. The erosion control plan shall be drafted and submitted to the BLM prior to initiating construction as part of the BLM right-of-way grant requirements.</p>
<b><i>Biological Resources, continued.</i></b>	
<i>Mitigation Measure BIO-9, continued.</i>	<p>In areas that require immediate stabilization, non-vegetative techniques that allow native species to reestablish can be used, including use of weed- and disease-free mulch, erosion blankets, or rolled organic fiber material. The use of such measures shall be identified in the Stormwater Pollution and Prevention Plan (SWPPP) for the Project or recommended by a soil or civil engineer based on slope, soil type, or other site factors as necessary and may be required later in the design phase.</p>
	<p>Mitigation Measure BIO-10: Obtain a Tree or Plant Removal Permit from San Bernardino County and the Nevada Division of Forestry</p> <p>The Applicant shall obtain a Tree or Plant Removal Permit from San Bernardino County and the Nevada Division of Forestry This permit is issued in compliance with San Bernardino County Development Code Subsection 88.01.050 for removal of regulated plants. The Applicant shall comply with all provisions of the Permit. A permit shall be required from the Nevada Division of Forestry and/or the BLM in order to relocate succulents within the Project alignment. The Applicant shall also comply with the California Desert Native Desert Plants Act, consistent with pertinent BLM regulations.</p>
	<p>Mitigation Measure BIO-11: Compensate for the Loss of Sensitive Vegetation Communities</p> <p>The Applicant shall compensate for the loss of Sensitive Vegetation Communities prior to initiating construction. Compensation ratios shall be based on site-specific information and determined through coordination with state and federal agencies (the California Department of Fish and Game (CDFG), the United States Army Corps of Engineers (USACE) and the BLM). This site-specific information will supplement the executed studies for the Project, including the 2010 botanical survey in California near Mountain Pass investigating the area where Segment 4C, if constructed, would be located. Compensation should be provided at a minimum 1:1 ratio (1 acre restored or created for every 1 acre removed/disturbed) and may be a combination of onsite restoration/creation, offsite restoration, or</p>

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<b>Resource</b>	<b>Mitigation and Commitments</b>
	mitigation credits. The Applicant shall develop and implement a restoration and monitoring plan that describes enhancement of sensitive communities, creation, and monitoring over a select time period.
	<p>Mitigation Measure BIO-12: Conduct Preconstruction Surveys and Identify Sensitive Areas</p> <p>The Applicant shall mark specific areas of important riparian vegetation shall be marked with orange fencing and the limits of disturbance narrowed to reduce effects to sensitive vegetation where the rail alignment crosses the Mojave River,</p>
<b><i>Biological Resources, continued.</i></b>	
	<p>Mitigation Measure BIO-13: Avoid Known Special-Status Plant Populations During Project Design</p> <p>To the extent possible, the Applicant shall design the Project to avoid special-status plant populations, updating design-build Project plans accordingly. The Applicant shall comply with the minimum survey and mitigation standards as required by BLM Manual 6840-1. Where avoidance is infeasible, the Applicant shall focus on minimizing the width of construction work areas in and around special-status plant populations. Before construction, special-status plant populations shall be demarcated with temporary orange construction fencing and posted as a restricted area. Depending on the proximity of the populations to the construction work area, populations shall be monitored to ensure adverse effects on special-status plant populations are avoided. If effects on special-status plant populations are unavoidable, the Applicant shall implement Mitigation Measure BIO-14..</p>
	<p>Mitigation Measure BIO-14: Compensate for Adverse Effects on Special-Status Plant Populations</p> <p>If effects on a special-status plant population are unavoidable, the Applicant shall coordinate with the United States Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG) to determine the appropriate mitigation strategy. If affected plants are listed under the federal Endangered Species Act (ESA), the appropriate take permits would be obtained from USFWS. Currently accepted mitigation of effects on special-status plants includes acquisition and preservation of nearby occupied habitat, or habitat creation at a ratio determined by the regulatory agency. Transplantation of affected populations is not considered a viable mitigation option. Creation of habitats with high levels of endemism, such as vernal pools, is effective only with stringent agency management guidelines. The Applicant shall coordinate with the USFWS to develop an effective mitigation and monitoring plan for specific vernal pool plants in conjunction with the construction of compensatory vernal pool habitat. Alternatively, the Applicant could acquire and preserve nearby high-quality occupied habitat, with the Applicant responsible for the long-term habitat management.</p>
	Mitigation Measure BIO-15: Prepare a Desert Tortoise Relocation Plan



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	<p>The Applicant shall develop a Desert Tortoise Relocation Plan in conjunction with the United States Fish and Wildlife Service (USFWS) Southern Nevada and Ventura Ecological Services Offices, the BLM, the NPS, and the California Department of Fish and Game. The relocation plan shall outline procedures and protocols to follow when tortoises need to be relocated out of the areas of disturbance. The relocation plans shall include:</p> <ul style="list-style-type: none"> <li>▪ Clearance procedures for construction areas;</li> <li>▪ Relocation procedures;</li> </ul>
<b><i>Biological Resources, continued.</i></b>	
<i>Mitigation Measure BIO-15, continued.</i>	<ul style="list-style-type: none"> <li>▪ Procedures for determining the health of tortoises;</li> <li>▪ Relocation areas;</li> <li>▪ Methods that shall be used to manage and protect relocation areas;</li> <li>▪ Monitoring for short and long term success of the plan; and</li> <li>▪ Permitted activities.</li> </ul>
	<p><b>Mitigation Measure BIO-16: Prepare Final Mitigation Monitoring Report</b></p> <p>The Applicant shall ensure that no more than 90 days after the completion of construction, the monitoring biologists prepare a report for the United States Fish and Wildlife Service (USFWS), the BLM, and appropriate state agencies. The report shall include the effectiveness of mitigation measures, the results of preconstruction and construction monitoring including the number of desert tortoises excavated and moved.</p>
	<p><b>Mitigation Measure BIO-17: Implement Mitigation Measures Outlined by the Regional USFWS Ecological Services Office to Protect Desert Tortoises</b></p> <p>The Applicant, in accordance with the United States Fish and Wildlife Service (USFWS) guidance, shall pay mitigation fees for disturbance to Desert Tortoise habitat on BLM administered public lands in Nevada.</p>
	<p><b>Mitigation Measure BIO-18: Compensate for the Permanent Loss of Desert Tortoise Habitat</b></p> <p>The Applicant shall provide compensation for the permanent loss of desert tortoise habitat. Compensation for loss of habitat in California shall be provided by the Applicant according to requirements of the BLM, the United States Fish and Wildlife Service (USFWS), and the California Department of Fish and Game (CDFG). Current requirements for loss of desert tortoise habitat are based on a formula of 5:1 inside Desert Wildlife Management Areas (DWMAs) and 1:1 outside of DWMAs. For</p>

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	<p>the purposes of the Project, changes to the compensation formula must be reviewed and approved by the USFWS, the NPS, and the CDFG.</p> <p>For Project-related loss of habitat in Nevada, the Applicant shall follow the mitigation measures outlined by the Regional USFWS Ecological Office for the protection of desert tortoises.</p>
<i>Biological Resources, continued.</i>	
	<p><b>Mitigation Measure BIO-19: Construct Exclusion Fencing, Culverts, and Wildlife Crossings</b></p> <p>The Applicant shall install culverts under the proposed railroad line that match existing I-15 or Union Pacific Railroad (UPRR) culverts. Where the Project deviates from existing transportation facilities, the Applicant shall install culverts adequately designed to serve as wildlife crossings at natural drainage features and at appropriate intervals to allow for wildlife passage, including, but not limited to, desert tortoises and other wildlife to pass under the proposed rail alignment. The Project design shall ensure flow for natural drainages equal to or greater than four feet in width (as measured by the distance between the ordinary high water mark on each side of the drainage) during Project construction or operation in order to reduce potential effects to wildlife movement, including, but not limited to, desert tortoise and desert bighorn sheep. The culverts and fencing would be designed and spacing determined through coordination with the United States Fish and Wildlife Service (USFWS), the NPS, the BLM, the California Department of Fish and Game (CDFG), the Nevada Department of Wildlife (NDOW), and the United States Environmental Protection Agency (EPA) to ensure they meet agency wildlife standards. Exclusion fencing would be constructed parallel to the rail line and would direct tortoises and other wildlife species to the culverts.</p>
	<p><b>Mitigation Measure BIO-20: Compensate for the Permanent Loss of Mohave Ground Squirrel Habitat</b></p> <p>If Mohave ground squirrels are determined to be present in the Project area, the Applicant shall purchase compensatory lands to mitigate for the permanent loss of suitable habitat. Acreage of suitable habitats that shall be permanently affected by the segments alignments, associated stations, and operation and maintenance facilities was presented in Draft EIS <b>Table 3.3-11</b>. The mitigation ratios and the location of the compensatory lands shall be determined through coordination with the California Department of Fish and Game (CDFG) pursuant to Section 2081.</p>
	<p><b>Mitigation Measure BIO-21: Avoid Active Burrows or Passively Relocate Owls</b></p> <p>If burrowing owls are detected within 250 feet of proposed construction within the Project area, the Applicant shall implement the following measures:</p> <ul style="list-style-type: none"> <li>▪ Occupied burrows shall not be disturbed during the nesting season (February 1 through August</li> </ul>

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	<p>31).</p> <ul style="list-style-type: none"> <li>▪ If avoidance is the preferred method of dealing with potential effects, no disturbance shall occur within 160 feet of occupied burrows during the non-breeding season or within 250 feet during the breeding season.</li> </ul>
<b><i>Biological Resources, continued.</i></b>	
<i>Mitigation Measure BIO-21, continued.</i>	If destruction of occupied burrows is unavoidable during the non-nesting season (September 1–January 31), passive relocation techniques (e.g., installing one-way doors at burrow entrances) shall be used instead of trapping and active relocation. At least one week will be necessary to accomplish passive relocation and allow owls to acclimate to alternate burrows. Unsuitable burrows that will not be destroyed in the vicinity of the Project shall be enhanced (enlarged or cleared of debris).
<b>Section 4(f) Resources</b>	
None required.	

Source: Circlepoint, 2011.

