

MITIGATION MONITORING AND REPORTING PROGRAM VALLEY LINK (SCH# 2018092027)

PREPARED FOR:



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April 2021

ICF. 2021. Mitigation Monitoring and Reporting Program for the Valley Link Project. April. San Francisco, CA. Prepared for Tri-Valley–San Joaquin Valley Regional Rail Authority, Livermore, CA.

Mitigation Monitoring and Reporting Program

1.0 Introduction

The California Environmental Quality Act (CEQA) requires that a Lead Agency establish a program to monitor and report on mitigation measures that it has adopted as part of the environmental review process, and that this program must be adopted at the time that the agency determines to carry out a project for which the environmental review process has been conducted (Public Resources Code Section 21081.6 (a) (1)). The Tri-Valley—San Joaquin Valley Regional Rail Authority (Authority) has prepared this Mitigation Monitoring and Reporting Program (MMRP) to ensure that mitigation measures identified in the Valley Link Project (Project) Environmental Impact Report (EIR) are fully implemented.

As the lead agency and proponent of this project, the Authority will implement the mitigation measures through its own actions, those of the construction Contractor, those of the rail service Operator and actions taken in cooperation with other agencies and entities. The Authority is ultimately accountable for the overall administration of the mitigation and monitoring program and for assisting relevant individuals and parties in their oversight and reporting responsibilities. The responsibilities of mitigation implementation, monitoring, and reporting extend to several entities including the Contractor and/or Operator as described below. However, the Authority will bear the primary responsibility for verifying that the mitigation measures are implemented.

2.0 Contractor Responsibilities

The Authority has defined the mitigation measures required for the Project that will be the construction Contractor's responsibilities.

The construction Contractor shall:

- Implement the mitigation measures for which it is responsible, as identified in Table 1, Summary of Mitigation Measures;
- Monitor its and its subcontractors' construction activities to ensure that the mitigation measures are being properly implemented;
- Accurately report its activities and results to the Authority;
- As one of the Contractor's Key Personnel, provide a qualified Environmental Compliance Lead for the Project who is acceptable to the Authority; and
- Provide additional specific expertise to fulfill specific roles as indicated in Section 4.0 to assist in the implementation of the MMRP.

3.0 Authority Responsibilities

The Authority will provide oversight of the Contractor’s and Operator’s activity and effectiveness of mitigation activities consistent with the reporting and monitoring schedule described in the column Implementation and Reporting Schedule in Table 1. The Authority will also implement mitigation that Table 1 indicates will be implemented by the Authority.

4.0 Table 1 – Summary of Mitigation Measures

The MMRP for the Project is presented as a table that includes the mitigation measures identified in the final EIR. The table is organized by environmental issue. The Authority may refine how it will implement a mitigation measure as long as compliance is achieved during Project implementation. Several supplementary tables from the final EIR are included at the end of this document that is referenced in the mitigation measures for ease of reference.

4.1 Description of Table Headers

The MMRP describes implementation and monitoring responsibilities, timing, implementation and reporting schedules, and implementation mechanisms or tools for each mitigation measure identified in the EIR, as described below. Reference to Contractor includes all subcontractors, as appropriate, working the direction and authority of the Contractor.

Mitigation Measure: Provides the mitigation measure as identified the final EIR.

Implementing, Monitoring, and Reporting Responsibilities: Identifies the entities that will be responsible for directly implementing the mitigation measures, reporting, and monitoring. Implementation can be the responsibility of the Authority, the Contractor, or other specified individuals such as a Qualified Biologist. Reporting on implementation will generally be the responsibility of the Contractor, with monitoring oversight provided by the Authority during the design and construction process. Post construction mitigation (such as monitoring replanted trees) may transition from the Contractor to Authority. Long-term mitigation responsibilities separate from construction will be held by the Authority.

Mitigation Timing: Implementation of mitigation will not all occur at the same time. Depending on the mitigation requirements, it may be undertaken prior to construction, during construction, following construction, or during operation of the project. These columns identify the stage(s) of the project during which the mitigation will be implemented and when reporting is to occur if it is required.

Implementation and Reporting Schedule: This column of the table describes when the mitigation will be implemented and when reporting is to occur if it is required.

Implementation Mechanism or Tool: Identifies the actions required to implement the mitigation measure, including any required agency consultation, documentation, agreements and/or conditions.

4.2 Implementation Roles

Responsibilities for implementation of this MMRP are as follows:

- **Contractor:** Designated contractor responsible for design and construction and for implementing or monitoring and reporting mitigation measures as specified in this MMRP.
- **Authority:** Lead Agency and designated representative responsible for the implementation, monitoring and reporting regarding mitigation measures specified in this MMRP.
- **Project Operator:** The operator of the Valley Link service, including responsibility for maintenance of the right of way and facilities.
- **Qualified Biologist:** A Qualified Biologist will be retained by the Authority for permitting and responsible for regulatory permit preparation and support (excluding responsibilities that will be assigned to the USFWS-Approved Biologist, as described below). A Qualified Biologist will also be retained by the contractor for construction and will be responsible for preparing and providing a Worker Environmental Awareness Training Program, as well as providing oversight to the Contractor's implementation of the biological mitigation and monitoring. Minimum qualifications for this position include the following: an individual with a bachelor's degree in biology or a similar natural resource field of study and prior experience monitoring the implementation of mitigation activities, as well as long-term success monitoring of mitigation projects.
- **USFWS-Approved Biologist:** A USFWS-Approved Biologist will be retained by the Authority for permitting and responsible for regulatory permit preparation and support. A USFWS-Approved Biologist will be retained by the Contractor and will be responsible for ensuring the appropriate treatment of federally listed species as identified in the EIR. Minimum qualifications for this position include the following: An individual with a bachelor's degree in biology or a similar natural resource field of study, possessing USFWS approval or a Section 10(A)(1)(a) permit to identify, handle, and relocate federally listed threatened and endangered species potentially present in the construction area.
- **Qualified Botanist:** A Qualified Botanist will be retained by the Authority and will be responsible for surveying areas of proposed construction disturbance containing undeveloped habitat suitable to support the special-status plants identified in the EIR to support permitting. A Qualified Botanist will also be retained by the Contractor and be responsible for preparing a revegetation and monitoring plan, if avoidance of special-status plants during construction is not possible. Minimum qualifications for this position include the following: an individual with a bachelor's degree in botany, biology, or similar a natural resource field of study, possessing experience conducting botanical surveys for special-status plant species and vegetation restoration in the greater San Francisco Bay Area.
- **Certified Arborist:** A Certified Arborist will be retained by the Authority for tree survey and development of the Tree Replacement Plan in cooperation with the contractor and will also be responsible for consulting with cities, counties, and affected property owners along the Project corridor during plan preparation. A Certified Arborist will also be retained by the Contractor for Project construction and will be responsible for overseeing the Contractor's tree mitigation in

conformance with the EIR. The Contractor in general shall avoid impacts to trees along the alignment through its final design and layout, where feasible. Minimum qualifications for this position include the following: (1) Minimum 3 years full-time experience in arboriculture or 2-year degree in arboriculture and 2 years practical experience for a 4-year degree in related field and one year of practical experience; and (2) a currently Certified Arborist per the ISA (International Society of Arboriculture).

- **Qualified Professional Archaeologist:** A Qualified Professional Archaeologist will be retained by the Contractor and will meet the Secretary of the Interior (SOI) Standards of Archaeology. The Qualified Professional Archaeologist will be responsible for implementing mitigation and coordinating the status of the archaeological mitigation with the Authority, the Contractor, and Archeological Monitors. The Qualified Professional Archaeologist will also be responsible for coordinating with the local Native American community. Minimum qualifications for this position are a graduate degree in archeology, anthropology, or closely related field plus: at least one year of full-time professional experience or equivalent specialized training in archeological research, administration, or management; at least four months of supervised field and analytic experience in general North American archeology and demonstrated ability to carry research to completion.
- **Archaeological Monitor:** Archaeological monitors will be retained by the Contractor and will be responsible for field monitoring of archaeological resources. The Authority will perform pre-construction investigation. Minimum qualifications for this position are a Bachelor's degree in anthropology with an emphasis in archaeology or closely related field (such as history or geology) and subsequent course work in archaeology and twelve months professional archaeology experience in California.
- **Qualified Geologist or Paleontologist:** A Qualified Geologist or Paleontological will be retained by the Authority for preparing the paleontological resources assessment and conducting environmental awareness training regarding paleontological resources. The Qualified Geologist or Paleontologist shall also be responsible for directing assessment and recovery actions in the event of an inadvertent discovery of paleontological resources. The Qualified Geologist or Paleontologist shall meet the qualifications found in the Society of Vertebrate Paleontology Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources (Society of Vertebrate Paleontology 2010).
- **Qualified Environmental Consultant for additional hazardous material site assessment:** A Qualified Environmental Consultant will be retained by the Authority and will be responsible for preparation of a Phase II Environmental Site Assessment (ESA). The Contractor shall retain a Qualified Environmental Consultant who can assess whether hazardous materials are encountered and oversee their removal, disposal, and remediation in accordance with all applicable rules, regulations, and laws. Minimum qualifications for this position are that the consultant be a Professional Engineer (P.E.) or Professional Geologist (P. G.), registered in California, with experience conducting Phase II ESAs.
- **Qualified Acoustical Consultant:** A Qualified Acoustical Consultant will be retained by the Contractor and will be responsible for preparing the noise and vibration control plan. Minimum qualifications for this position include the following: 10+ years of experience as practicing

acoustical consultant; and a licensed professional engineer or Board Certified by the Institute of Noise Control Engineering.

5.0 Contractor Environmental Compliance Lead

The Contractor's Environmental Compliance Lead shall have a minimum of 10 years of experience overseeing and implementing compliance with requirements of environmental impact reports and required mitigations on major construction projects in California. The individual shall have expertise in compliance, mitigation, and in CEQA and NEPA regulations.

6.0 Construction Project Team Organization

Implementation of the MMRP related to construction will be a team effort consisting of both Authority and Contractor personnel. The Contractor's Environmental Compliance Lead shall be responsible for communications and coordination with the Authority's designated environmental lead regarding all MMRP activities throughout the duration of design and construction of the Project and following construction as determined by the Authority.

Contractor team members with specialized expertise identified in Section 4.2 shall report to the Contractor's Environmental Compliance Lead and shall work closely with Authority-designated experts in similar disciplines.

It is anticipated that, at a minimum, monthly meetings will be held between Authority and Contractor environmental leads and staffs to review status and progress relative to MMRP activities during construction. Additionally, the Authority and Contractor construction environmental leads shall ensure that all pre-requisite MMRP activities to design and construction are completed in a timely manner.

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Table 1. Mitigation Monitoring and Reporting Program – Summary of Mitigation Measures

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
<p>AES-1.1: Install visual barriers between construction work areas and sensitive residential and recreational receptors</p> <p>The Authority will install visual barriers between stationary construction work areas and sensitive residential (e.g. where residences are directly adjacent to construction areas) and recreational receptors (e.g., where parks are directly adjacent to construction areas) to reduce impacts from the invasion of privacy and the change in visual quality.</p> <p>Barriers will not need to be placed along the Tri-Valley Alignment or in proximity to the Dublin/Pleasanton Station, Isabel Station, Southfront Road Station because construction would be occurring within the median or in close proximity to I-580, where residential and recreational receptors do not come in to direct visual contact with the construction site, and there are no residences or recreational areas that would be affected by staging areas identified for the Tri-Valley Alignment.</p> <p>Barriers will be placed to obscure views of stationary work areas (e.g., staging areas or areas of fixed construction) in other locations (not noted above) where construction activity and equipment would be disruptive and likely to lower the existing visual quality and residential or recreational receptors are directly adjacent to the construction areas.</p> <p>These efforts will include the following actions and performance standards:</p> <ul style="list-style-type: none"> ● The Authority will install visual barriers to minimize sensitive receptors’ (i.e., residents and recreational areas) views of construction work areas. <ul style="list-style-type: none"> ○ The visual barriers will be placed to protect residents and recreational areas within 0.25 mile of Project element construction sites where residents or recreationalists would have unobstructed views of the construction area. Recreational areas close to the project corridor that may require barriers can be found listed within the <i>Existing Visual Resources</i> section for each alignment, station, parking facility, and operations and maintenance facility. The visual barrier may be chain link fencing with privacy slats, fencing with windscreen material, a wood barrier, or other similar barrier. ○ The visual barrier will be a minimum of 6 feet high to help maintain the privacy of residents and block ground-level views toward stationary construction activities. <p>Although the visual barriers would introduce a visual intrusion, they would greatly reduce the visual effects associated with visible construction activities, and screening construction activities and protecting privacy is deemed desirable. The visual barriers are an effective means for reducing the visibility of active construction work areas, thereby minimizing the impact on existing localized visual quality.</p>	Contractor	X	X			<p>Authority shall include as contract requirement.</p> <p>Contractor shall include in construction plans for Authority review prior to construction.</p>	<p>Authority review and approval of visual screening plan prior to construction.</p>

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<p>AES-1.2: Limit construction near residences to daylight hours</p> <p>Construction activities scheduled to occur between 7 a.m. and 6 p.m. near residential areas within 0.25 mile of construction sites, other than construction in I-580, will not take place before or past daylight hours, which vary according to season.</p> <p>This will reduce the amount of construction experienced by viewer groups because most construction activities would occur during business hours when most viewer groups are likely to be at work and eliminate the need to introduce high-wattage lighting sources that would operate near residences.</p> <p>Construction of the Tri-Valley Alignment along I-580 will be required to control nighttime construction lighting per Mitigation Measure AES-1.3.</p>	Contractor	X	X			<p>Authority shall include as contract requirement.</p> <p>Contractor shall include in construction plans for Authority review prior to construction.</p>	Authority review and approval of construction plan prior to construction.
<p>AES-1.3: Minimize fugitive light from portable sources used for construction</p> <p>Any nighttime lighting used for nighttime construction will be evaluated for its ability to safely light the construction work area while reducing light spill and glare. At a minimum, the construction contractor will minimize Project-related light and glare to the maximum extent feasible, given safety considerations, for all viewer groups. Color-corrected halide lights or balloon lights, if suitable for construction of the Project, will be used. Portable lights will be operated at the lowest allowable wattage and height and raised to a height no greater than 20 feet, except for pedestrian bridge and flyover work. All lights will be screened and directed downward toward work activities and away from the night sky and nearby residential areas to the maximum extent possible. The number of nighttime lights used will be minimized to the greatest extent possible. This measure will also help to ensure that glare is minimized for nighttime drivers along I-580.</p>	Contractor	X	X			<p>Authority shall include as contract requirement.</p> <p>Contractor shall include in construction plans for Authority review prior to construction.</p>	Authority review and approval of construction plan prior to construction.
<p>AES-2.1: Landscape parking facilities at stations</p> <p>This mitigation measure would apply to parking lots and parking structures at all stations.</p> <p>Surface parking lots will be planted with trees and groundcover to improve aesthetics and provide shade. Parking structures will also provide landscaping in planter beds, which will be located around the perimeter of the structures. If space allows, street trees will also be planted in association with surface parking lots and parking structures. Shrubs may also be used if space allows. All landscaping will be designed to ensure passenger safety (e.g., so that security cameras and safety lighting are not obscured). No invasive plant species will be used under any circumstances. In addition, plant palettes will use drought-tolerant plant species and have a strong emphasis on California native plant species that are appropriate for a given site. An irrigation and maintenance program will be implemented during the plant establishment period and continued, as needed, to ensure plant survival. The landscaping plan will maximize the use of planting zones that are water efficient. Landscaped areas will be irrigated with a “smart” watering system that evaluates site conditions and plant materials and compares them against weather conditions to avoid overwatering. To avoid undue water flows, the irrigation system will be managed so that any broken spray heads, pipes, or other components are fixed within 1 to 2 days or the zone or system will be shut down until it can be repaired.</p>	<p>Contractor shall assume responsibility for landscaping implemented as part of construction.</p> <p>Operator for landscaping during operations.</p>	X	X	X	X	<p>Authority shall include as contract requirement.</p> <p>Contractor shall include landscaping plans in construction plans for Authority review prior to construction.</p> <p>Contractor shall include irrigation and maintenance plan.</p> <p>Operator shall follow same procedures as construction Contractor.</p>	<p>Authority review and approval of landscaping plans prior to construction.</p> <p>Authority review and approval of irrigation and maintenance plan prior to construction.</p>

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<p>AES-2.2: Apply aesthetic design treatments to parking structures, pedestrian overcrossings, Interim OMF, viaduct structures, and retaining walls with high visibility along I-580 and from roadways within the Altamont Hills</p> <p>The project will implement an aesthetic design treatment for new pedestrian bridges over tracks, and bridges with high visibility. Choosing earth-toned colors for the surfaces will be less distracting to viewers than light or brightly colored surfaces. In general, light buff/tan or light gray colors stand out more than darker colors such as darker browns, red-browns, and warm grays that have the ability to complement the surrounding vegetation. The design motif applied to structures will reflect a combination of naturally colored surfaces and surfaces that are textured to appear as natural materials (e.g., rock or cobble) or that incorporates a design theme (e.g., wildlife and plants of local, native oak woodlands; traditional architectural elements such as inset panels; or other design reflecting local heritage or environment) using form liners. This will reduce visual monotony, soften verticality, reduce glare, and be more visually pleasing to viewers than plain surfaces for exterior facing barriers and girders on bridges that will be visible to traffic or recreational viewers passing under the overcrossing, decking, abutments and side supports, and columns. Nearby examples of such treatments include the I-5/French Camp interchange in Stockton and the SR 99/Sheldon Road overcrossing in Elk Grove. Non-local examples include Maryland 216 in Prince Georges County, Maryland; US 54/East Kellogg Drive and South Oliver Street interchange in Wichita, Kansas; and Roberts Road Bridge in Los Gatos, California. Roughened surfaces would soften the verticality of the surfaces by providing visual texture and reducing the amount of smooth surface that can reflect light.</p>	Contractor	X	X			<p>Authority shall include as contract requirement.</p> <p>Contractor shall include in construction plans for Authority review prior to construction.</p>	<p>Authority review and approval of construction plans prior to construction.</p>
<p>AES-2.3: Use selective grading and planting techniques in the Altamont Hills</p> <p>Prior to construction mobilization, the Authority and/or its' contractor will develop a grading and planting plan that identifies site-specific measures to remediate exposed soil and terrain issues, create a smooth transition between disturbed and natural habitats, and mitigate visual effects within the Altamont Hills. The term <i>construction mobilization</i> refers to the moment approval is given for materials and supplies, construction equipment, construction facilities and staging, and personnel to be physically on-site and for site modifications to begin. Existing information, such as topographical maps, vegetative surveys or records, and photographs, that show pre-existing site-specific (or reference-site) conditions prior to construction will be evaluated and used as tools for restoring disturbed sites. In general, however, the majority of sites will be evaluated for restoration to native habitat because of the amount of terrain alteration as well as vegetation and habitat loss that could result from construction of the proposed alignment and stations in the Altamont Hills. At a minimum, the grading and revegetation plans will meet the following performance standards.</p> <ul style="list-style-type: none"> • Access roads to stations in the Altamont Hills will use the existing terrain as an asset to create curvilinear roadways that locate access roads parallel to slopes. Access roads running perpendicular to slopes will be avoided. This will reduce the visibility of the access road and make it more harmonious with the natural terrain. This technique will not be used where doing so would constitute a negative impact on sensitive habitats or sensitive species that outweighs the reduction of visual effects. • Surface parking areas will use the natural terrain as well, except where slopes exceed Americans with Disabilities Act access standards. This will create subtle, gently undulating surface parking lots with visual variety. • All terrain will be designed and graded to be rounded, avoiding sharp angles and steep or abrupt grade breaks or slope cuts. All exposed slopes will be seeded for erosion control and aesthetics. The Authority will require construction contractors to incorporate native grass to standard seed mixes, which may be non-native; however, under no circumstances will any 	Contractor	X	X			<p>Authority shall include as contract requirement.</p> <p>Contractor shall include in construction plans for Authority review prior to construction.</p>	<p>Authority review and approval of construction plan prior to construction.</p>

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<p>invasive grass plant species be incorporated into the seed mix.</p> <ul style="list-style-type: none"> Special attention will be paid to transitions between undisturbed and disturbed terrain to ensure that the transition appears as natural as possible and blend the lines between the two for a natural, organic appearance. 							
<p>AES-2.4: Underground new electric transmission lines in visually sensitive areas</p> <p>Where feasible, the Authority will underground new electric transmission line utilities (e.g., connections to TPSS sites, utilities supplying power to traction power stations) in visually sensitive areas to minimize their visual intrusion upon the landscape. This mitigation applies to new electric transmission lines in the Altamont Segment east of Greenville Road that may be associated with the Greenville TPSS connection to PG&E only. This mitigation does not apply to the connection between the proposed new TPSS that is approximately 0.3 mile east of the PG&E Midway substation and the PG&E Midway substation.</p> <p>OCS lines must be overhead and thus this measure does not apply to the OCS lines along the alignment. Undergrounding will not be required where existing transmission poles are used to carry additional power lines associated with the project or within urban areas where existing transmission corridors are present and the city has provided an exemption to undergrounding new utilities.</p> <p>Undergrounding will be a priority in the Altamont Hills. However, undergrounding will not be used where implementation constitutes an additional adverse impact on sensitive habitats or sensitive species that outweighs the reduction in visual effects. Therefore, underground electric transmission lines may daylight to avoid such areas. In such cases, the Project engineer will identify site-specific location adjustments to minimize tree removal and strategically locate new transmission lines along designated scenic routes in a manner that reduces the visual impacts on scenic resources and views along those routes.</p> <p>Implementation of this measure will minimize the effects on existing visual quality and character that result from new electric transmission lines in visually sensitive locations and due to associated removal and pruning of mature vegetation along proposed new transmission lines.</p>	Contractor	X	X		<p>Authority shall include as contract requirement.</p> <p>Contractor shall include in construction plans for Authority review prior to construction.</p>	<p>Authority review and approval of construction plan prior to construction; documentation of acceptance by affected utilities.</p>	
<p>AES-2.5: Apply aesthetic surface treatments to certain structures in visually sensitive areas</p> <p>This measure applies to new fencing, pedestrian bridge safety barriers, safety railings, TPSS, OCS and steel transmission poles in the Altamont Hills. This measure also applies to the solar array infrastructure at the Tracy OMF. This measure also applies to all signal houses associated with the proposed alignments that would be visible to residents and from recreational areas and local roadways.</p> <p>These features will be colored or painted a shade that is two to three shades darker than the general surrounding area. Colors will be chosen from U.S. Department of the Interior, Bureau of Land Management, Standard Environmental Colors Chart CC-001, June 2008, which provides suitable colors for a variety of landscape types. Because color selection will vary by location, the facility designer will employ the use of color panels, which will be evaluated from KOPs during common lighting conditions (e.g., front lighting versus backlighting) to aid in the selection of an appropriate color. Color selections will be made from the coloring of the most prevalent season. Panels will be a minimum of 3 by 2 feet and evaluated from various distances, within 1,000 feet, to ensure the best possible color. If the TPSS contains a non-metal structure, then the building exterior will also utilize the color selection techniques described above to improve aesthetics, such as by using integral-colored concrete.</p> <p>All paints used for the color panels and structures will be color matched directly from the physical color chart rather than</p>	Contractor	X	X		<p>Authority shall include as contract requirement.</p> <p>Contractor shall include in construction plans for Authority review prior to construction.</p>	<p>Authority review and approval of construction plan prior to construction.</p>	

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<p>digital or color-reproduced versions of the color chart. Paints will be a dull, flat, or satin finish to reduce the potential for glare; the use of glossy paints for surfaces will be avoided. Appropriate paint types will be selected that ensure durability for the finished structures. The appropriate operating agency or organization will maintain the paint color over time.</p> <p>In addition, OCS and steel transmission poles in the Altamont Hills will be designed in a manner that allows these features to blend with the surrounding built and natural environments so that the new features complement the visual landscape. Aesthetic considerations shall be considered when selecting OCS pole design. Different pole designs, including round poles, square poles, and multi-face poles, have different characteristics. Some individuals find square poles to be aesthetically less desirable due to their angularity. In addition, the Authority shall consider options to reduce pole diameter with increased pole thickness instead of wider poles with lesser thickness. Aesthetic considerations shall be balanced with other considerations including cost, safety, maintenance, and durability. The Authority shall also evaluate the potential to house OCS wire-tensioning weights inside larger diameter poles.</p>							
<p>AES-3.1: Replace disturbed vegetation along landscaped freeways</p> <p>The Authority will work with the appropriate Caltrans district landscape architect to determine if disturbed portions of landscaped freeways (as defined in Table 3.1-2 in this section) require replanting and to what extent. At a minimum, trees and shrubs will be replaced at a 1:1 ratio. Container sizes and species will be determined in coordination with the appropriate Caltrans district landscape architect. Disturbed groundcover will be replanted to match existing groundcover unless the Caltrans district landscape architect specifies otherwise. Irrigation of replacement plants will also be coordinated with the appropriate Caltrans district landscape architect because watering may occur with existing irrigation systems or irrigation systems may need to be installed. Any irrigation lines that are damaged within the state right-of-way because of Project construction will be replaced per Caltrans standards in coordination with the appropriate Caltrans district landscape architect. No invasive plant species will be planted under any circumstances.</p>	Contractor	X	X	X	<p>Authority shall include as contract requirement.</p> <p>Contractor shall include landscaping plans in construction plans for Authority review prior to construction.</p> <p>Contractor shall include irrigation and maintenance plan to Caltrans satisfaction.</p>	<p>Authority review and approval of landscape, irrigation and maintenance plans prior to construction.</p> <p>Caltrans approval of landscaping, irrigation, and maintenance plan.</p>	
<p>AES-5.1: Apply minimum lighting standards</p> <p>This measure applies to all permanent sources of lighting installed as part of the Proposed Project.</p> <p>All artificial outdoor lighting will be limited to safety and security requirements, designed using the Illuminating Engineering Society’s design guidelines, and in compliance with International Dark-Sky Association–approved fixtures. All lighting will be designed to have minimum impact on the surrounding environment and use downcast cut-off type fixtures that direct light only toward objects requiring illumination. Shielding will be used where needed to ensure that light pollution is minimized. Therefore, lights will be installed at the lowest allowable height to cast low-angle illumination that minimizes incidental light spill onto adjacent properties and open spaces or backscatter into the nighttime sky. The lowest allowable illuminance level will be used for all lighted areas, and the number of nighttime lights needed to light an area will be minimized to the highest degree possible. Light fixtures will have non-glare finishes that will not cause reflective daytime glare. Lighting will be designed for energy efficiency, with daylight sensors or timed with an on/off program. Parking garage lighting will be designed to meet safety requirements but will use locational motion-activated sensing, with regular-intensity lighting when a person is near a row of vehicles, then lower-intensity lighting after a period of inactivity when no one is near the vehicles. Lights will provide good color rendering, with natural light qualities and the minimum intensity feasible for security, safety, and personnel access</p>	Contractor	X	X		<p>Authority shall include as contract requirement.</p> <p>Contractor shall include in construction plans for Authority review prior to construction.</p>	<p>Authority review and approval of construction plan prior to construction.</p>	

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		Pre-Construction	Construction	Post-Construction	Operation		
<p>needs. Lighting, including light color rendering and fixture types, will be designed to be aesthetically pleasing.</p> <p>All LED lighting will avoid the use of BRWL lamps or a correlated color temperature that is higher than 3,000 degrees K (International Dark-Sky Association 2010a, 2010b, 2015). Wherever possible and pragmatic, the Authority will use fixtures and lighting control systems that conform to the International Dark-Sky Associations’ Fixture Seal of Approval program. In addition, LED lights will use shielding to ensure that nuisance glare and light spill do not affect sensitive residential viewers.</p> <p>Luminaires will be chosen for the ability to provide horizontal and vertical beam control for better control in directing what is illuminated. Luminaires will also incorporate photometric reflector systems that are designed to reduce light pollution. Lights in parking lots and along pathways and station platforms will employ shielding to minimize off-site light spill, ambient light glow, and glare. They will also be screened and directed away from residences and adjacent uses to the highest degree possible. The amount of nighttime lights used will be minimized to the highest degree possible to ensure that spaces are not unnecessarily over-lit while still maintaining minimum adequate lighting to provide necessary visibility for security. For example, the amount of light can be reduced by limiting ornamental light posts to higher-use areas and using bollard lighting on travelway portions of the pathways.</p> <p>To ensure safety, interior parking structure lighting would be allowed, but the unnecessary overuse of interior nighttime lighting would be minimized such that the structure is not over-lit when not actively in use.</p> <p>Technologies to reduce light pollution evolve over time. Current design measures may help control light pollution but may not be the most effective means of control once the Project is designed. Therefore, all design measures used to reduce light pollution will employ the technologies available at the time of Project design to allow for the highest potential reduction in light pollution.</p>							
<p>AG-1.1: Restore Important Farmlands used for temporary staging areas</p> <p>Prior to any ground-disturbing activities at the site of a temporary disturbance area located on Important Farmland, the contractor will engage a qualified restoration specialist or soil scientist to prepare a site restoration plan. The purpose of the plan will be to return each disturbed site to similar slope and soil conditions after construction is complete. This restoration plan will address site-specific actions (e.g., topsoil salvage and replacement, soil decompaction), the sequence of implementation, and the parties responsible for implementation and successful achievement of restoration. Before beginning construction on Important Farmland, the contractor will (1) submit the qualifications of the restoration specialist or soil scientist to the Tri-Valley–San Joaquin Valley Regional Rail Authority (Authority) for review and approval and (2) after Authority approval, coordinate with the specialist to develop a draft restoration plan and will submit the restoration plan to the Authority for review and obtain Authority (and, if applicable, the landowner) approval. The restoration plan will also include time-stamped photo documentation of the pre-construction conditions of all temporary disturbance areas.</p> <p>The Authority will ensure that the contractor will return all construction access, mobilization, material laydown, and staging areas on Important Farmlands to a condition equal to the pre-construction staging condition through implementation of the restoration plan. This requirement will be included in the construction contract requirements.</p>	Contractor	X	X	X	<p>Authority shall include as contract requirement.</p> <p>Contractor shall include restoration plans for Authority review prior to construction.</p> <p>Contractor shall document farmland restoration after construction.</p>	<p>Authority review and approval of restoration plans prior to construction.</p> <p>Authority review and approval of restoration documentation after construction</p>	

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
<p>AG-1.2: Conserve Important Farmlands (Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland)</p> <p>The Authority will enter into an agreement with the California Department of Conservation and its California Farmland Conservancy Program to implement agricultural land mitigation. The Authority will fund the California Farmland Conservancy Program’s work to identify suitable agricultural land for mitigation of impacts and fund the purchase of agricultural conservation easements from willing sellers. The performance standards for this measure are to preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions where the impacts occur, at a replacement ratio of not less than 1:1 for Important Farmlands that are permanently converted to nonagricultural use by the Proposed Project and 0.5:1 for Important Farmland parcels that are divided into severed or remnant parcels that are not viable for continued agricultural production.</p> <p>The Authority will document implementation of Mitigation Measure AG-1.2 through completion of the agreement and a report to the Authority Board showing completion of conservation easement acquisition.</p>	Authority	X	X	X		Authority shall develop agreement and fund the agreement by no later than the end of construction.	Authority shall report completion of the agreement to the Authority Board prior to the completion of construction.
<p>AG-3.1: Notify agricultural property owners or leaseholders</p> <p>Prior to the start of any construction or maintenance activity on or adjacent to Important Farmland that would result in temporary use of Important Farmland, the Authority will provide written notification to agricultural property owners or leaseholders immediately adjacent to the footprint of the alignment, station, or OMF. The notification will indicate the intent to begin construction or maintenance, including the estimated date for the start of construction or maintenance activities. In order to provide agricultural property owners or leaseholders sufficient lead time and make any changes to their operations due to construction or maintenance, this notification shall be provided at least 3 months but no more than 12 months prior to the start of the activity.</p>	Contractor	X	X	X	X	Authority shall include as contract requirement. Contractor shall notify property owners prior to construction and maintenance.	Authority review and approval of notifications
<p>AG-3.2: Coordinate with utility and energy service providers</p> <p>Prior to construction, the contractor will prepare a technical memorandum documenting how construction or maintenance activities that could affect utility or energy service deliveries would be coordinated with service providers to minimize or avoid interruptions. The technical memorandum will be provided to the Authority for review and approval.</p>	Contractor	X	X			Authority shall include as contract requirement. Contractor shall include utility coordination plan in construction plans for Authority review prior to construction.	Authority review and approval of utility coordination plan prior to construction.
<p>AG-3.3: Verify new irrigation facilities are operational before disconnecting the original facility</p> <p>Where relocating an irrigation facility is necessary, the contractor will verify the new facility is operational prior to disconnecting the original facility, where feasible. The contractor will document all relocations in a memorandum for Authority review and approval.</p>	Contractor	X	X			Authority shall include as contract requirement. Contractor shall include utility coordination plan in construction plans for Authority review prior to construction.	Authority review and approval of utility coordination plan prior to construction.

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
<p>AG-3.4: Maintain access to Important Farmlands</p> <p>Where construction would temporarily affect existing farm access roads with valid use rights serving Important Farmland, the Authority will coordinate with agricultural property owners or leaseholders to provide temporary access, as necessary to maintain routine agricultural operations and normal business activities during Project construction. If temporary crossings are necessary, they shall comply with State legal requirements for railroad crossings.</p>	Contractor	X	X			<p>Authority shall include as contract requirement.</p> <p>Contractor shall include in construction plans for Authority review prior to construction.</p>	Authority review and approval of construction plan prior to construction.
<p>AG-3.5: Provide permanent equipment crossings on affected access roads</p> <p>Where construction would permanently affect existing farm access roads with valid use rights serving Important Farmland, the Authority will coordinate with agricultural property owners or leaseholders to provide permanent access, as necessary to maintain routine agricultural operations and normal business activities. If new crossings are necessary, they shall comply with State legal requirements for railroad crossings.</p>	Contractor	X	X	X		<p>Authority shall include as contract requirement.</p> <p>Contractor shall include in construction plans for Authority review prior to construction.</p>	Authority review and approval of construction plan prior to construction.
<p>AQ-2.1: Implement advanced emissions controls for off-road equipment during construction</p> <p>The Tri-Valley–San Joaquin Valley Regional Rail Authority (Authority) shall require the following construction equipment exhaust emissions requirements to be included in construction contract specifications:</p> <ul style="list-style-type: none"> All off-road equipment greater than 25 horsepower and operating for more than 20 total hours over the entire duration of construction activities shall have engines that meet or exceed either USEPA or CARB Tier 4 Final off-road emission standards, if commercially available. Lesser-tier engines shall be allowed on a case-by-case basis when the contractor has documented that no engine equipment or emissions equivalent retrofit equipment is available for a particular equipment type that must be used to complete construction. Documentation shall consist of signed written statements from at least two construction equipment rental firms or equivalent. A copy of each unit’s certified tier specification and any required CARB or air pollution control district operating permit shall be collected by the contractor at the time of mobilization of each piece of equipment and included in monthly reporting to the Authority. Construction contractor(s) shall utilize portable electrical equipment where commercially available and practicable to complete construction. Construction contractors shall utilize electrical grid power instead of diesel generators when (1) grid power is available at the construction site; (2) when construction of temporary power lines are not necessary in order to provide power to portions of the site distant from existing utility lines; (3) when use of portable extension lines is practicable given construction safety and operational limitations; and (4) when use of electrical grid power does not compromise construction schedules. When electrical equipment is not practicable for portable equipment and/or electrical grid power is not practicable, then diesel construction equipment that can utilize renewable diesel safely and effectively shall use renewable diesel provided renewable diesel is available within reasonable distance from the construction site. Contractors shall provide the Authority (or the Authority’s oversight contractor) with documentation prior to construction showing their evaluation of the availability of portable electrical equipment, potential use of grid power, and their plans to use renewable diesel in fulfillment of these requirements and shall document implementation of those plans during 	Contractor	X	X			<p>Authority shall include as contract requirement.</p> <p>Contractor shall include an emissions control plan in construction plans for Authority review prior to construction.</p> <p>Contractor shall document field compliance with the equipment requirements and provide to Authority periodically during construction.</p>	<p>Authority review and approval of emissions control prior to construction.</p> <p>Authority shall review compliance with equipment requirements during construction.</p>

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
construction.							
<p>AQ-2.2: Implement off-road engine maintenance and idling restrictions during construction</p> <p>The Authority shall require the following construction equipment exhaust emissions requirements to be included in construction contract specifications:</p> <ul style="list-style-type: none"> • The construction contractor shall minimize off-road equipment idling times either by shutting equipment off when not in use or reducing the maximum idling time to 2 minutes. Clear signage will be provided for construction workers at all access points. • All construction equipment shall be maintained and properly tuned in accordance with manufacturer’s specifications. • All equipment shall be checked by a certified visible emissions evaluator. 	Contractor	X	X		<p>Authority shall include as contract requirement.</p> <p>Contractor shall include an emissions control plan in construction plans for Authority review prior to construction.</p> <p>Contractor shall document field compliance with the equipment requirements and provide to Authority periodically during construction.</p>	<p>Authority review and approval of emissions control prior to construction.</p> <p>Authority shall review compliance with equipment requirements during construction.</p>	
<p>AQ-2.3: Implement advanced emissions controls for trains during construction</p> <p>The Authority shall require the following construction equipment exhaust emissions requirements to be included in construction contract specifications:</p> <ul style="list-style-type: none"> • The construction contractor shall require that all diesel-powered trains used during Project construction have engines that meet or exceed either USEPA or CARB Tier 4 train emission standards. • A copy of each unit’s certified tier specification and any required CARB or air pollution control district operating permit shall be collected by the contractor at the time of mobilization of each piece of equipment and included in monthly reporting to the Authority. 	Contractor	X	X		<p>Authority shall include as contract requirement.</p> <p>Contractor shall include an emissions control plan in construction plans for Authority review prior to construction.</p> <p>Contractor shall document field compliance with the equipment requirements and provide to Authority periodically during construction.</p>	<p>Authority review and approval of emissions control prior to construction.</p> <p>Authority shall review compliance with equipment requirements during construction.</p>	
<p>AQ-2.4: Utilize modern fleet for on-road material delivery and haul trucks during construction</p> <p>The Authority shall require the following material-hauling truck fleet mix requirements to be included in construction contract specifications:</p> <ul style="list-style-type: none"> • The construction contractor shall ensure that all on-road heavy-duty diesel trucks with a gross vehicle weight rating of 19,500 pounds or greater used at the project site will comply with USEPA 2007 on-road emission standards for PM10 (0.01 grams per brake horsepower-hour) where commercially available. These PM10 standards were phased in through the 2007 and 2010 model years on a percent of sales basis (50 percent of sales in 2007 to 2009 and 100 percent of sales in 2010). This measure assumes that all on-road heavy-duty diesel trucks will be model year 2010 and newer, with all trucks compliant with USEPA 2007 on-road emission standards. While impacts are associated with PM2.5 concentrations and the USEPA 2007 on-road emission standards address PM10 emission, the newer engine technologies that are required to meet 	Contractor	X	X		<p>Authority shall include as contract requirement.</p> <p>Contractor shall include an emissions control plan in construction plans for Authority review prior to construction.</p> <p>Contractor shall document field compliance with the equipment requirements and provide to</p>	<p>Authority review and approval of emissions control prior to construction.</p> <p>Authority shall review compliance with equipment requirements during construction.</p>	

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<p>the PM10 emission standards will also reduce PM2.5 concentrations. In finalizing the 2007 emission standards, USEPA concluded that the standards finalized in the rule would significantly reduce Heavy-Duty Vehicle emissions of SOX, NOX, VOCs and elemental carbon, and thus contribute to reductions in ambient concentrations of PM10 and PM2.5 (USEPA 2001).</p> <ul style="list-style-type: none"> For specialty delivery or hauling vehicles, lesser-tier engines shall be allowed on a case-by-case basis when the contractor has documented that no engine equipment or emissions equivalent retrofit equipment is available for a particular delivery or hauling vehicles that must be used to complete construction. Documentation shall consist of signed written statements from at least two truck rental or supplier firms or equivalent. Copies of truck fleet compliance with this requirement shall be collected and included in monthly reporting to the Authority. 						Authority periodically during construction.	
<p>AQ-2.5: Implement fugitive dust controls during construction</p> <p>The Authority shall require the following fugitive dust control requirements to be included in construction contract specifications.</p> <p>The construction contractor shall implement basic and enhanced control measures at all construction and staging areas to reduce construction-related fugitive dust. The following measures are based on BAAQMD’s CEQA guidelines and are in conformance with SJVAPCD fugitive dust control requirements (Regulation VIII).</p> <p><u>Basic Fugitive Dust Control Measures</u></p> <ul style="list-style-type: none"> All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) will be watered two times per day. All haul trucks transporting soil, sand, or other loose material offsite will be covered. All visible mud or dirt track-out onto adjacent public roads will be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. All roadways, driveways, and sidewalks to be paved will be completed as soon as possible. Building pads will be laid as soon as possible after grading unless seeding or soil binders are used. Post a publicly visible sign with the telephone number and the name of the person to contact at the lead agency regarding dust complaints. This person will respond and take corrective action within 48 hours. The phone number of the district will also be visible to ensure compliance. <p><u>Enhanced Fugitive Dust Control Measures for Land Disturbance</u></p> <ul style="list-style-type: none"> All exposed surfaces will be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe. All excavation, grading, and/or demolition activities will be suspended when average wind speeds exceed 20 mph. Wind breaks (e.g., trees, fences) will be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity. 	Contractor	X	X			<p>Authority shall include as contract requirement.</p> <p>Contractor shall include an emissions control plan in construction plans for Authority review prior to construction.</p> <p>Contractor shall document field compliance with the equipment requirements and provide to Authority periodically during construction.</p>	<p>Authority review and approval of emissions control prior to construction.</p> <p>Authority shall review compliance with equipment requirements during construction.</p>

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
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<ul style="list-style-type: none"> Vegetative ground cover (e.g., fast-germinating native grass seed) will be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established. The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time will be limited. Activities will be phased to reduce the amount of disturbed surfaces at any one time. <p><u>Measures for Entrained Road Dust</u></p> <ul style="list-style-type: none"> The Project shall comply with applicable trackout prohibition, trackout cleanup, monitoring, and recordkeeping requirements in BAAQMD Regulation 6, Rule 6, as applicable to the Project in addition to the requirements below. All trucks and equipment, including their tires, will be washed off prior to leaving the site. Site accesses to 100 feet from the paved road will be treated with a 6- to 12-inch compacted layer of wood chips, mulch, or gravel. Sandbags or other erosion control measures will be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent. All vehicle speeds on unpaved roads will be limited to 15 mph. All unpaved roads will be watered twice daily. 							
<p>AQ-2.6: Enter into a Voluntary Emissions Reduction Agreement for Project Construction Emissions over BAAQMD emissions in the SFBAAB</p> <p>The Authority shall require the following fugitive dust control requirements to be included in contract specifications.</p> <p>Prior to construction, the Authority or its contractor will enter into a memorandum of understanding (MOU) with the Bay Area Clean Air Foundation (Foundation), a public non-profit and supporting organization for the BAAQMD, to reduce VOC and NO_x to below the appropriate CEQA threshold levels through a voluntary emissions reduction agreement.</p> <p>The mitigation fee amount will be determined at the time of mitigation to fund one or more emissions reduction projects within the SFBAAB. The Foundation will require an additional administrative fee of no less than 5 percent. The mitigation fee will be determined by the Authority or its contractor and the Foundation based on the type of projects available at the time of mitigation. When the CEQA threshold is exceeded, these funds may be spent to reduce either VOC or NO_x emissions (ozone precursors). This fee is intended to fund emissions reduction projects to achieve reductions, with the estimated tonnage of emissions reductions required starting in the first year of construction. Documentation of payment will be provided to the Authority or its designated representative.</p> <p>The MOU will include details regarding the annual calculation of required mitigation amounts the Authority must achieve, funds to be paid, administrative fee, and the timing of the emissions reduction projects. Acceptance of this fee by the Foundation will serve as an acknowledgment and commitment by the Foundation to: (1) implement an emissions reduction project(s) within a timeframe to be determined based on the type of project(s) selected after receipt of the mitigation fee designed to achieve the emission reduction objectives; and (2) provide documentation to the Authority or its contractor describing the project(s) funded by the mitigation fee, including the amount of emissions reduced (tons per year) in the</p>	Authority	X	X		Authority shall enter into a MOU with the Bay Area Clean Air Foundation.	Authority to report implementation of the MOU to Authority Executive Director prior to construction.	

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
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<p>SFBAAB from the emissions reduction project(s). To qualify under this mitigation measure, the specific emissions reduction project(s) must result in emission reductions in the SFBAAB that are real, surplus, quantifiable, enforceable, and will not otherwise be achieved through compliance with existing regulatory requirements or any other legal requirement. Funding will need to be received prior to contracting with participants and should allow enough time to receive and process applications to fund and implement off-site reduction projects prior to commencement of project activities being reduced. This will roughly equate to 1 year prior to the required mitigation; additional lead time may be necessary depending on the level of offsite emission reductions required for a specific year.</p> <p>The implementation of this mitigation measure would not be expected to affect air quality in the BAAQMD because funding emissions reductions would not result in any physical change to the environment, and therefore would not result in other secondary environmental impacts. In addition to VOC and NO_x, the implementation of emission-reduction projects could result in reductions of other criteria pollutants and/or GHGs. However, this would be a secondary effect of this mitigation measure and is not a required outcome to mitigate any impacts of the project.</p>							
<p>AQ-2.7: Enter into a Voluntary Emissions Reduction Agreement for Project Construction Emissions over SJVAPCD emissions in the SJVAB</p> <p>The Authority shall require the following fugitive dust control requirements to be included in construction contract specifications.</p> <p>The Authority or its contractor will enter into a Voluntary Emissions Reduction Agreement (VERA) with the SJVAPCD that will establish the framework for fully mitigating construction emissions of NO_x, VOC, PM10, and PM2.5 below the SJVAPCD thresholds in the SJVAB. The project-level VERA must be executed prior to commencement of construction and the mitigation fees and reductions delivered and achieved according to the requirements of the VERA.</p> <p>The implementation of this mitigation measure would not be expected to affect air quality in the SJVAPCD because purchasing emissions reductions would not result in any physical change to the environment, and therefore would not result in other secondary environmental impacts. In addition to NO_x and PM10, the implementation of emissions reduction projects could result in reductions of other criteria pollutants, GHGs, or both. However, this would be a secondary effect of this mitigation measure and is not a required outcome to mitigate any impacts of the project.</p>	Authority	X	X		Authority shall enter into a Voluntary Emissions Reduction Agreement (VERA) with the SJVAPCD.	Authority to report implementation of the agreement to Authority Executive Director prior to construction.	
<p>BIO-1.1: Conduct preconstruction surveys for special-status plant species</p> <p>The Authority will retain a qualified botanist to conduct preconstruction surveys for special-status plant species specified in Table 3.4-2. During appropriate species-specific identification periods at least 1 year prior to the initiation of construction, the qualified botanist will survey suitable habitat in the work areas for the species, in accordance with CDFW protocols (California Department of Fish and Wildlife 2018b). The results of the surveys, which will require multiple visits because of varying blooming periods and differences in work area construction initiation, will be documented in brief reports or technical memoranda. If the survey demonstrates the absence of special-status plant species in the improvements area, no further actions will be required. If special-status plant species are present in the area and can be avoided, a 20-foot no-disturbance buffer will be installed around the plants. If special-status plant species are present in the area and cannot be avoided (work within 20 feet), then Mitigation Measure BIO-1.2 described below will be employed. If Mitigation Measure BIO-1.2 is infeasible, then compensatory mitigation per the applicable regional habitat conservation plans (i.e., 5:1 mitigation ratio for covered plant</p>	Contractor	X			Authority shall include as contract requirement. Contractor shall develop a plant survey plan for Authority review and approval, conduct surveys and report results to Authority prior to construction.	Authority review and approval of survey plan and survey report prior to construction.	

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
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<p>species under the EACCS and 3:1 for plants under the SJMSCP) will be followed for all special-status plant species. At minimum at 3:1 mitigation ratio will apply for permanent impacts to special-status plant species. If a federal- and/or state-listed species is present, the Authority will notify USFWS and/or CDFW to discuss avoidance and mitigation measures. Acquisition of incidental take permits will be pursued with the applicable resource agencies prior to construction activities if avoidance of federal- and/or state-listed plant species are infeasible.</p>							
<p>BIO-1.2: Prepare a salvage, relocation, or propagation and monitoring plan for special-status plant species</p> <p>If the protocol-level botanical survey reveals the presence of special-status plant species in the study area, the Authority will notify USFWS and/or CDFW. A qualified botanist or restoration ecologist will prepare a salvage, relocation, or propagation and monitoring plan in coordination with USFWS and/or CDFW prior to construction to address affected special-status plant species. The plan will include provisions that address the techniques, location, and procedures required for the successful establishment of the plant populations. The plan will include provisions for performance that address survivability requirements, maintenance, monitoring, implementation, and the annual reporting requirements. The following performance standards will apply.</p> <p>Monitoring and success criteria applicable to special-status plant salvage, relocation, or propagation will require the following.</p> <ul style="list-style-type: none"> • At least two surveys by a qualified botanist or ecologist per monitoring year. • At least 80 percent of the planted area must support vegetation composition and density consistent with reference population conditions. • At least 80 percent of the planted area must support target species amounts similar to reference feature conditions. • A minimum of 5 consecutive years of monitoring to ensure success criteria are met. • Remedial actions to restore intended ecological function of planted areas that fail to meet the success criteria for 3 consecutive years. 	Contractor	X	X	X	<p>Authority shall include as contract requirement.</p> <p>Contractor shall prepare a salvage, relocation, or propagation and monitoring plan prior to disturbance of special-status plant species for Authority and USFWS and/or CDFW.</p> <p>Contractor shall implement plan after Authority, USFWS and/or CDFW approval including meeting success criteria and monitoring requirements. A completion report will be submitted to Authority, USFWS and/or CDFW.</p>	<p>Authority review and approval of salvage, relocation or propagation and monitoring plan prior to submittal to USFWS and/or CDFW.</p> <p>USFWS and/or CDFW review and approval prior to construction.</p> <p>Mitigation completion report review and approval by Authority, USFWS, and/or CDFW.</p>	
<p>BIO-1.3: Document affected special-status plant species</p> <p>All directly affected areas of special-status plants will be documented by a qualified botanist or ecologist retained by the Authority prior to impacts. Documentation will include density and percent cover; key habitat characteristics, including soil type, associated species, hydrology, and topography; and photographs of preconstruction conditions.</p>	Contractor	X			<p>Authority shall include as contract requirement.</p> <p>Contractor shall develop a plant survey plan for Authority review and approval, conduct surveys and report results in Authority prior to construction.</p>	<p>Authority review and approval of survey plan and survey report prior to construction.</p>	
<p>BIO-1.4: Prevent introduction or spread of invasive plant species</p> <p>The Authority will implement the following actions to avoid and minimize the spread or introduction of invasive plant species.</p> <ul style="list-style-type: none"> • Clean construction equipment and vehicles in a designated wash area prior to entering and exiting the construction site. • Educate construction supervisors and managers about invasive plant identification and the importance of controlling and 	Contractor	X	X	X	<p>Authority shall include as contract requirement.</p> <p>Contractor shall include in an invasive species control plan construction plans for</p>	<p>Authority review and approval of invasive species control plan prior to construction.</p> <p>Authority review and</p>	

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<p>preventing the spread of invasive plant infestations.</p> <ul style="list-style-type: none"> Treat small, isolated infestations with eradication methods that have been approved by or developed in conjunction with CDFW and USFWS to prevent or destroy viable plant parts or seeds. Minimize surface disturbance to the greatest extent feasible to complete the work. Use native, noninvasive species or nonpersistent hybrids in erosion-control plantings to stabilize site conditions and prevent invasive plant species from colonizing. Use weed-free imported erosion-control materials (or rice straw) in upland areas. <p>One year after construction, conduct a monitoring visit to each active or previously active (within 1 year) improvement footprint to ensure that no new occurrences of invasive plant species not previously present have become established.</p>						<p>Authority review prior to construction.</p> <p>Contractor shall complete post-construction monitoring and conduct remedial action if needed and submit monitoring report to Authority.</p>	<p>approval of post construction monitoring report.</p>
<p>BIO-2.1: Obtain coverage from, be consistent with, and tier from existing conservation strategies as feasible</p> <p>The Authority will either obtain coverage through the applicable HCP, NCCP, or other biological conservation plan, where applicable, or follow the guidance in these conservation plans and strategies in developing compensatory mitigation strategies. Construction activities within Alameda County will either obtain compensatory habitat mitigation through the EACCS or use the mitigation prescribed in the EACCS as a basis for mitigation and obtain coverage under separate applicable state and federal permits from CDFW and USFWS. Similarly, construction within San Joaquin County will either obtain compensatory habitat mitigation through the SJMSCP or use the mitigation prescribed in the SJMSCP as a basis for mitigation and obtain coverage under separate applicable state and federal permits from CDFW and USFWS. The Authority will be responsible for acquiring, funding, monitoring, restoring, enhancing, reporting, and implementing compensatory habitat mitigation and contingency actions per the applicable state and federal permits.</p> <p>If impacts occur outside of applicable HCP, NCCP, or other biological conservation plan or regional conservation strategy coverage area, the Authority will implement compensatory mitigation for impacts on habitat for the species listed below, at the corresponding mitigation ratios.</p> <ul style="list-style-type: none"> Longhorn fairy shrimp and vernal pool fairy shrimp—10:1 ratio (mitigation area to impact area) Valley elderberry longhorn beetle—3:1 California tiger salamander and California red-legged frog—3:1 Giant garter snake—3:1 Swainson’s hawk (includes foraging habitat in the San Joaquin Valley)—1:1 to 0.25:1, (dependent on nest location) Burrowing owl—3:1 Riparian brush rabbit and riparian woodrat—3:1 San Joaquin kit fox and American badger—3:1 	<p>Authority shall obtain coverage from applicable plans and implement compensatory mitigation for special-status species, as necessary.</p> <p>As may be necessary, Authority shall obtain coverage under separate applicable state and federal permits from CDFW and USFWS.</p>	X	X			<p>Authority shall obtain coverage prior to construction.</p> <p>Authority shall prepare a compensatory mitigation plan prior to construction and shall implement all required compensatory activities prior to the end of construction.</p>	<p>Authority shall report completion of the compensatory mitigation to the Authority Executive Director at the end of construction.</p>

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
<p>Where feasible during construction, the Authority will employ a 250-ft no-disturbance buffer around habitats including vernal pools, freshwater wetlands, and riparian habitats that may support special-status species.</p> <p>Impacts that occur within the region-specific plan coverage areas will be mitigated at amounts consistent with the respective plan.</p>							
<p>BIO-2.2: Conduct a worker environmental training program for construction personnel</p> <p>Before any equipment staging, grading, or vegetation removal in areas supporting or potentially supporting sensitive biological resources (e.g., aquatic, riparian, and wetlands habitat; habitat for special-status wildlife species; active bird nests, active bat roosts), The Authority will prepare and implement a worker environmental awareness training program. The training program will be provided to all construction personnel (contractors and subcontractors) to brief them on the need to avoid effects on sensitive biological resources and penalties for not complying with applicable state and federal laws and permit requirements. The training program will be delivered by a biologist and will include information on the life history and habitat requirements of special-status species potentially occurring in or adjacent to the improvements footprint, the importance of protecting habitat, and the terms and conditions of the BOs and other applicable permits. The training program will also cover general restrictions and guidelines that must be followed by all construction personnel to reduce or avoid effects on sensitive biological resources during construction.</p>	Contractor	X	X		<p>Authority shall include as contract requirement.</p> <p>Contractor shall include in an environmental awareness training plan as part of construction plans for Authority review prior to construction.</p>	<p>Authority review and approval of environmental awareness plan prior to construction.</p>	
<p>BIO-2.3: Implement noise reduction measures for pile driving in or adjacent to streams and wetlands as feasible</p> <p>Potential injury and mortality associated with pile driving, which may be required for the pile installation for the new and replacement bridges, will be minimized by implementing the measures listed below.</p> <p>The contractor will be required to implement the following measures, developed in coordination with the design engineers, to minimize the exposure of special-status fish and aquatic wildlife species to potentially harmful underwater sounds:</p> <ul style="list-style-type: none"> • If feasible, the contractor will vibrate all piles to the maximum depth possible before using an impact hammer. • During impact driving, the contractor will limit the number of strikes per day to the minimum necessary to complete the work. • The smallest pile driver and minimum force necessary will be used to complete the work. • During impact driving, the contractor will be required to use a bubble ring or similar device to minimize the extent to which the interim peak and cumulative SEL thresholds are exceeded. • Pile driving activity will not occur at night. • If feasible, in-water work will occur behind a dewatered cofferdam. A biologist will be present at initial dewatering to salvage and rescue any stranded fish and/or wildlife. 	Contractor	X	X		<p>Authority shall include as contract requirement.</p> <p>The Contractor shall prepare a noise reduction and monitoring plan, including hydroacoustic monitoring for Authority review.</p>	<p>Authority review of noise study and review and approval of noise reduction and monitoring plan prior to construction.</p>	
<p>BIO-2.4: Implement seasonal restrictions for in-water work as feasible</p> <p>There will be a construction work window of June 15 to October 15 for all work within creek and river channels. This time period will minimize impacts on migrating special-status fish species, such as adult steelhead and Chinook salmon. In-water</p>	Contractor	X	X		<p>Authority shall include as contract requirement.</p> <p>Contractor shall prepare a</p>	<p>Authority review and approval of biological resources avoidance and minimization plan prior to</p>	

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
work within flowing streams will dewater only up to half of the wetted stream at any time to allow fish passage. Seasonal restrictions for in-water work are also applicable to special-status aquatic wildlife species.						biological resources avoidance and minimization plan for Authority review prior to construction.	construction.
BIO-2.5: Protect wetlands during construction The Authority will ensure that a qualified resource specialist (i.e., wetland biologist, ecologist, soil scientist) will clearly identify wetland areas to be preserved abutting construction areas and wetland areas outside of the direct construction area, with high-visibility construction fencing or markers (e.g., lathe or pin flags) before site preparation. Construction will not encroach upon jurisdictional wetlands to be preserved that are identified by the resource specialist. The resource specialist will use the Project’s verified wetland delineation to confirm the location of wetland boundaries, based on existing conditions at the time of the avoidance marking. Exclusion fencing or markers will be installed before construction activities are initiated, and the fencing will be maintained throughout the construction period. No construction activity, traffic, equipment, or materials will be permitted in fenced wetland areas to be preserved. Exclusion fencing and markers will be removed following the completion of construction activities. All conditions imposed by the state and federal permits will be implemented. The conditions will be clearly identified in the construction plans and specifications and monitored during and after construction to ensure compliance.	Contractor	X	X			Authority shall include as contract requirement. Contractor shall prepare a biological resources avoidance and minimization plan for Authority review prior to construction.	Authority review and approval of biological resources avoidance and minimization plan prior to construction.
BIO-2.6: Protect sensitive natural communities, including riparian habitat, during construction The Authority will ensure that a qualified resource specialist (i.e., biologist, botanist, ecologist, soil scientist) will clearly identify sensitive natural communities, including riparian habitat, to be preserved abutting the construction areas and outside of the direct construction area with high-visibility construction fencing or markers (e.g., lathe or pin flags) before site preparation. Construction will not encroach upon sensitive natural communities identified by the resource specialist to be preserved. The resource specialist will use the verified wetland delineation, soils data, and land cover data to confirm the location of sensitive natural community boundaries, based on existing conditions at the time of the avoidance marking. Exclusion fencing or markers will be installed before construction activities are initiated, and the fencing will be maintained throughout the construction period within the segment. No construction activity, traffic, equipment, or materials will be permitted in fenced sensitive natural community areas to be preserved. Exclusion fencing and markers will be removed following completion of construction activities. All conditions imposed by the state and federal permits will be implemented. The conditions will be clearly identified in the construction plans and specifications and monitored during and after construction to ensure compliance.	Contractor	X	X			Authority shall include as contract requirement. Contractor shall prepare a biological resources avoidance and minimization plan for Authority review prior to construction.	Authority review and approval of biological resources avoidance and minimization plan prior to construction.
BIO-2.7: Protect vernal pool-endemic species If any work remains to be completed after the start of the rainy season (October 15 to June 1), the Authority or its contractor will install exclusion fencing and erosion control measures prior to any ground disturbance within 50 feet of wetlands and vernal pools under the guidance of an agency-approved biologist. The fencing will be installed around the perimeter of vernal pools and other seasonal wetlands. The contractor, under the supervision of the biologist, will erect and maintain the exclusion fencing.	Contractor	X	X			Authority shall include as contract requirement. Contractor shall prepare a biological resources avoidance and minimization plan for Authority review prior to construction.	Authority review and approval of biological resources avoidance and minimization plan prior to construction.

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
<p>BIO-2.8: Protect valley elderberry longhorn beetle</p> <p>Before ground disturbance within 165 feet of any elderberry shrubs (U.S. Fish and Wildlife Service 2017a) to be preserved, a biologist will identify any shrubs in and along improvement areas with potential to support valley elderberry longhorn beetle, and the Authority or its contractor will establish a 20-foot buffer between shrubs and the environmental footprints by installing concrete barriers (K-rails) at locations where daily construction activities will persist for more than 4 weeks or temporary orange construction fencing (4-foot-high commercial-quality woven polypropylene). Within buffer areas, signs will be posted along fencing for the duration of construction. The signs will contain the following text:</p> <p>This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the federal Endangered Species Act of 1973 (ESA), as amended. Violators are subject to prosecution, fines, and imprisonment.</p> <p>Buffers around elderberry shrubs or clusters of shrubs will be inspected weekly by the qualified biologist during ground-disturbing activities and monthly after ground-disturbing activities until construction is complete or until the fences are removed, as approved by the biologist and the resident engineer. The biologist will be responsible for ensuring that the contractor maintains the buffer area fences around elderberry shrubs throughout construction. The monitor will provide monthly biological inspection reports to the Authority and USFWS.</p> <p>The Authority will ensure that the construction area is watered down as necessary to prevent fugitive dust from becoming airborne and accumulating on elderberry shrubs in environmental footprints and adjacent to construction areas activities (including unpaved access routes).</p>	Contractor	X	X			<p>Authority shall include as contract requirement.</p> <p>Contractor shall prepare a biological resources avoidance and minimization plan for Authority review prior to construction.</p>	<p>Authority review and approval of biological resources avoidance and minimization plan prior to construction.</p>
<p>BIO-2.9: Protect California tiger salamander, western spadefoot toad, and California red-legged frog</p> <p>In advance of project activities, a qualified biologist will conduct a habitat assessment for California tiger salamander to determine if the alignment contains suitable upland and aquatic habitat for California tiger salamander. If the habitat assessment determines California tiger salamander habitat is present and project activities have the potential to impact tiger salamander and/or its habitat, the Authority will discuss with CDFW how to implement the project and avoid impacts to the species.</p> <p>The Authority will retain a USFWS- and/or CDFW-approved biologist (as appropriate) to identify and flag (pin flags or 4-foot lath) all suitable aquatic habitat to be preserved for California tiger salamander, western spadefoot toad, and California red-legged frog outside of, but within 250 feet of the environmental footprint and ground-disturbance areas prior to staging, vegetation clearing, grading, or other construction activities. Where feasible within the Proposed alignment and construction methods, the Authority or its contractor will protect habitat areas by installing orange exclusion and erosion control fencing at the maximum practicable distance from the work site or, if feasible, at least 250 feet from the aquatic habitat edge, wet or dry, to make it easily visible by construction crews. If a 250-foot buffer cannot be feasibly provided, then the Authority will assess the potential for hydrologic changes to aquatic habitat and adopt best management practices for controlling/limiting hydrologic changes (e.g., restoring hydrologic conditions after disturbance and/or providing compensatory habitat).</p> <p>To the maximum extent feasible, impacts to small mammal burrows from construction activities will be avoided. Where feasible, a 50-foot no-disturbance buffer around small mammal buffers will be maintained.</p>	Contractor	X	X			<p>Authority shall include as contract requirement.</p> <p>Contractor shall prepare a biological resources avoidance and minimization plan for Authority review prior to construction.</p>	<p>Authority review and approval of biological resources avoidance and minimization plan prior to construction.</p>

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
<p>A qualified biologist will conduct a preconstruction survey each morning before construction activities begin and continue to monitor ground-disturbing construction activities where suitable habitat occurs during all phases of construction to remove any California tiger salamander, western spadefoot toads, and California red-legged frogs found in the environmental footprint. Individual salamanders, toads, and frogs will be moved immediately to a relocation site, a minimum of 300 feet from the construction boundary. The relocation site will be determined in coordination with USFWS and/or CDFW prior to the commencement of construction activities.</p> <p>Construction activities near drainages and wetland complexes identified as potential movement corridors will take place between July 1 and October 1 when the California tiger salamander, western spadefoot toad, and California red-legged frog are least likely to be present in the construction area.</p> <p>To discourage California tiger salamander, western spadefoot toad, and California red-legged frogs from entering the construction areas from ditches, ditches will be equipped with lightweight one-way flow gates. These will be designed so that water can easily pass from the construction site to the ditches, but small vertebrates, such as the salamander, toad, or frog, cannot move upstream from ditches to the construction area.</p>							
<p>BIO-2.10: Protect foothill yellow-legged frog</p> <p>Within 3 to 5 days prior to entering or working near stream/riparian habitat within foothill yellow-legged frog range, a biologist will survey the construction site for frogs (adults, subadults, tadpoles, or egg masses) and at least 500 feet upstream and downstream (California Department of Fish and Wildlife 2018b). If construction activities are expected to result in effects beyond 500 feet downstream, the CDFW recommends the survey area be extended. Additionally, a qualified biologist will conduct a preconstruction survey each morning before construction activities begin and continue to monitor ground-disturbing construction activities where suitable habitat occurs during all phases of construction to remove any foothill-yellow legged frog found within the active construction work area.</p> <p>If no foothill yellow-legged frogs, tadpoles, or egg masses are found during the survey and no surface water is present in the construction area, work may commence without further surveys. If frogs, tadpoles, or egg masses are detected, individual frogs, tadpoles, or egg masses will be moved immediately to a relocation site that is a minimum of 300 feet from the construction boundary. The relocation site will be determined in coordination with CDFW prior to the commencement of construction activities. To avoid transferring disease or pathogens of handling of amphibians, the approved-biologist will follow the Declining Amphibian Task Force’s “Code of Practice” (U.S. Fish and Wildlife Service 2017).</p> <p>If feasible, construction activities within the stream and riparian habitat will avoid the foothill yellow-legged frog breeding season; the Authority will ensure that activities involving construction and heavy equipment use (e.g., excavation, grading, contouring) that are conducted in streams, ponds, and riparian areas are limited generally to July 15 to October 15, unless otherwise approved by CDFW. Impacts on oviposition sites will be avoided when possible; if avoidance is not possible and surveys confirm egg masses occur in high numbers (e.g., more than 100 eggs masses/kilometer), CDFW will be immediately contacted for further guidance.</p> <p>Where appropriate, exclusion fencing, as described in the CDFW (2018c) <i>Considerations for Conserving the Foothill Yellow-legged Frog</i>, will be installed to prevent frogs from entering the work area.</p> <p>If avoidance is not feasible, the Authority will apply for an Incidental Take Permit (ITP), pursuant to Fish and Game Code</p>	Contractor	X	X		<p>Authority shall include as contract requirement.</p> <p>Contractor shall prepare a biological resources avoidance and minimization plan for Authority review prior to construction.</p>	<p>Authority review and approval of biological resources avoidance and minimization plan prior to construction.</p>	

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
Section 2081 subdivision (b).							
<p>BIO-2.11: Protect western pond turtle and giant garter snake</p> <p>The Authority will implement the measures listed below to protect western pond turtle and giant garter snake during construction.</p> <p>Giant garter snake</p> <ul style="list-style-type: none"> • Where feasible, construction activities involving construction with heavy equipment use (e.g., excavation, grading, contouring) within suitable giant garter snake habitat will avoid the snake’s inactive/dormant period (generally October 2 to April 30). • To the maximum extent possible, all construction activities within giant garter snake habitat will be conducted during the snake’s active period (May 1 to October 1). • To reduce the likelihood of snakes entering the active construction areas that include or are adjacent to freshwater wetlands, slow-moving riverine aquatic habitat, marshes, ditches, and canals in the Central Valley during construction activities, the Authority or its contractor will install exclusion fencing along the freshwater marsh, aquatic riverine features, and open water areas outside of the environmental footprint (areas within 200 feet of suitable habitat). The exclusion fencing will be installed and maintained for the duration of construction within or adjacent to these features. The fencing will consist of 3- to 4-foot-tall erosion fencing buried at least 6 to 8 inches below the ground. To ensure that construction equipment and personnel do not affect aquatic habitat for giant garter snake outside the construction corridor, a combination of orange barrier fencing will be erected (in addition to the exclusion fencing) to clearly define the aquatic habitat to be avoided. • A qualified biologist will conduct a preconstruction survey in suitable habitat no more than 24 hours before construction. Prior to construction each morning, construction personnel will inspect exclusion and orange barrier fencing to ensure they are in good condition. Observations of snakes within the environmental footprint and access routes will be immediately reported to the biologist, and all activities will cease until appropriate corrective measures have been completed, the snake leaves the construction site under its own volition, or the biologist determines that the snake will not be harmed. The area undergoing construction will be re-inspected and surveyed by the biologist whenever a lapse in construction activity of 2 weeks or more occurs. • Any ground-disturbing activities within 200 feet of giant garter snake habitat that occur after October 1 will be monitored by a USFWS- and a CDFW-approved biologist for the duration of the work. • Vegetation clearing within 200 feet of the banks of potential giant garter snake aquatic habitat will be limited to the minimum area necessary. Giant garter snake habitat outside of but adjacent to the construction areas will be flagged and designated as an environmentally sensitive area to be avoided by all construction personnel. • The movement of heavy equipment within 200 feet of the banks of potential giant garter snake aquatic habitat will be confined to designated access and haul routes to minimize habitat disturbance. • Staging areas will be located at least 200 feet from suitable giant garter snake aquatic habitat. 	Contractor	X	X		<p>Authority shall include as contract requirement.</p> <p>Contractor shall prepare a biological resources avoidance and minimization plan for Authority review prior to construction.</p>	<p>Authority review and approval of biological resources avoidance and minimization plan prior to construction.</p>	

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
<p>Western pond turtle</p> <ul style="list-style-type: none"> • Where feasible, construction activities involving construction with heavy equipment (e.g., excavation, grading, contouring) within suitable western pond turtle upland habitat will avoid the western pond turtle egg laying period (generally mid-May to early July). • Prior to the start of construction within western pond turtle habitat (i.e., any undeveloped areas within 400 feet of riverine aquatic habitat, ponds, seasonal wetlands), the Authority will retain a biologist approved by the CDFW to survey and handle western pond turtles and conduct preconstruction surveys. Surveys will be conducted at each habitat area no more than 7 days prior to the initiation of ground disturbance at that location. • If ground-disturbing activities occur during the nesting or overwintering seasons, 1 week before and within 24 hours of beginning work in suitable aquatic habitat, a qualified biologist will conduct surveys for western pond turtle. The surveys will be timed to coincide with the time of day when turtles are most likely to be active (the cooler part of the day between 8:00 a.m. and 12:00 p.m. during spring and summer). Prior to conducting the surveys, the biologist will locate the microhabitats for turtle basking (logs, rocks, brush thickets) and determine a location to quietly observe turtles. Each survey will include a 30-minute wait time after arriving on the site to allow startled turtles to return to open basking areas. The survey will consist of a minimum 15-minute observation time per area where turtles could be observed. If western pond turtles are observed during either survey, a biological monitor will be present during construction activities in the aquatic habitat where the turtle was observed and capture and relocate, if possible, any entrapped turtle. The biological monitor also will be mindful of suitable nesting and overwintering areas in proximity to suitable aquatic habitat and periodically inspect these areas for nests and turtles. 							

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
<p>BIO-2.12: Protect California legless lizard, California glossy snake, coast horned lizard, and San Joaquin coachwhip</p> <p>The Authority will implement the measures listed below to protect California legless lizard, California glossy snake, coast horned lizard, and San Joaquin coachwhip during construction.</p> <p>A qualified biologist will conduct preconstruction surveys and construction monitoring in suitable habitat (i.e., open grassland and scrub with sandy, friable soils) to protect special-status lizards. Prior to construction or restoration activities in California annual grassland, riparian habitat, and California scrub with sandy soils or dense leaf litter, the biologist will conduct a preconstruction survey for special-status reptiles. This survey will include the following steps:</p> <ul style="list-style-type: none"> • Ensuring that all motorized vehicles and equipment observe a 5 mph speed limit during construction activities while not on existing rails within the environmental footprints. • Conducting systematic subsurface searching by raking leaf litter and sandy soil. • Staking the limits of the construction work areas and fencing them with small-mesh construction fencing, buried to a minimum depth of 6 to 10 inches below the ground, to reduce the likelihood of lizards reentering the active construction area. • Capturing and releasing special-status lizards into similar nearby habitat areas, as designated by the biologist. • Removing lizard exclusionary fence following completion of construction. <p>During construction in special-status lizard habitat, a qualified biologist will be present and have the authority to temporarily stop construction activities if he or she finds California legless lizard, California glossy snake, coast horned lizard, or San Joaquin coachwhip in the environmental footprint. Work will not resume until the biologist has successfully relocated the animals and determined that they would not be harmed by construction.</p>	Contractor	X	X			<p>Authority shall include as contract requirement.</p> <p>Contractor shall prepare a biological resources avoidance and minimization plan for Authority review prior to construction.</p>	<p>Authority review and approval of biological resources avoidance and minimization plan prior to construction.</p>
<p>BIO-2.13: Protect special-status and non-special-status nesting birds</p> <p>To the maximum extent feasible, the Authority will schedule vegetation removal (e.g., tree removal, herbaceous plant removal, mowing, control burn) during the nonbreeding season of birds (September 1–January 31). If vegetation removal cannot be removed in accordance with this timeframe, preconstruction surveys for nesting birds and additional protective measures will be implemented, as described below.</p> <p>In advance of project activities, a qualified biologist will conduct a habitat assessment for tricolored blackbird to determine if the alignment contains suitable habitat for tricolored blackbird. If the habitat assessment determines tricolored blackbird habitat is present and project activities have the potential to impact tricolored blackbird and/or its habitat, the Authority will discuss with CDFW how to implement the project and avoid impacts to the species.</p> <p>Authority or its contractor will conduct construction activities outside the bird nesting season (February 1 to September 15) to the extent feasible. If construction activities are unavoidable, Authority or its contractor will retain a qualified wildlife biologist with demonstrated nest-searching experience to conduct preconstruction surveys for nesting birds (including raptors but excluding golden eagle, Swainson’s hawk, and burrowing owl, which have separate mitigation measures below) within 500 feet of the active construction work area. A 300-foot survey buffer will be used for raptors and a 100-foot radius for passerines.</p>	Contractor	X	X			<p>Authority shall include as contract requirement.</p> <p>Contractor shall prepare a biological resources avoidance and minimization plan for Authority review prior to construction.</p>	<p>Authority review and approval of biological resources avoidance and minimization plan prior to construction.</p>

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
<p>Adjacent lands outside the active construction work area will be scanned with binoculars from the limit of ground disturbance, the UPRR ROW, and publicly accessible areas. Preconstruction surveys will occur no more than 7 days prior to the onset of ground-disturbing and vegetation-disturbing activities (including clearing, grubbing, staging, and vegetation trimming or removal) at each construction area. If active nests are found in the active construction work area, the biologist will establish a no-disturbance buffer around the nest and mark the buffer perimeter with high-visibility fencing, flagging, or wood stakes. The size of the no-disturbance buffer will be based on the species' sensitivity to disturbance and planned work activities in the vicinity; typical buffer sizes are 250 feet for raptors and 50 feet for other birds. However, in some cases the no-disturbance buffer may need to be adjusted (increased or decreased) based on site specific conditions such as the individual tolerance of specie; increases in the no-disturbance buffer size will be determine by a qualified biologist based on site specific conditions (e.g. type of project activity, topography, duration of project activity, line-of-site from project activity to nest etc.). The buffer will remain in place until the nest is no longer active, as determined by the biologist. Buffers for any nests found outside but within 300 feet of the construction area will be established, based on the biologist's best professional judgment as to whether the work would result in nest abandonment. If a lapse in construction activities of 15 days or longer at a previously surveyed environmental footprint occurs, another preconstruction survey will be conducted.</p> <p>If construction activities in or within 300 feet of freshwater marsh or streambank habitat occur during the breeding season (February 1 through September 15), and active nesting colonies of tricolored blackbird, yellow-headed blackbird, or bank swallow are observed by the qualified biologist, then a no-disturbance buffer of 300 feet will be established until the end of the breeding season or until the nesting colony or nest is determined inactive by the biologist (Bank Swallow Technical Advisory Committee 2013; California Department of Fish and Wildlife 2015). Nest buffers may be reduced if site-specific conditions reduce the possibility of construction activity disturbance, as determined by the qualified biologist in coordination with CDFW.</p> <p>To the extent possible, the Authority or its contractor will initiate structure demolition/ modification outside of the nesting season to avoid impacts on active nests affixed to structures before they become active during the nesting season (February 1 to September 15). If structure demolition activities cannot occur outside of the nesting season, the Authority or its contractor will remove inactive nests from the structure to be demolished and install nest exclusion measures (e.g., fine mesh netting, panels, metal projectors) outside the nesting season. All exclusionary devices will be monitored and maintained throughout the breeding season to ensure that they are successful in preventing the birds from accessing the cavities or nest sites. No more than 7 days prior to structure demolition activities, a qualified biologist will conduct a preconstruction survey of all potential nesting habitat on the structures to be demolished/ modified and the surrounding areas for the presence of active nests. If active nests are found on the structures or in the affected area, then demolition/modification activities will not proceed until the biologist verifies that all nests on the structures are inactive.</p> <p>After all surveys and/or nest deterrence activities are completed at each improvement environmental footprint within a given segment (e.g., Tri-Valley, Altamont, Tracy to Lathrop), the biologist will complete a memorandum detailing the survey effort and results and submit the memorandum to the Authority within 7 days of survey completion.</p>	Contractor	X	X			<p>Authority shall include as contract requirement.</p> <p>Contractor shall prepare a biological resources avoidance and minimization plan for</p>	<p>Authority review and approval of biological resources avoidance and minimization plan prior to construction.</p>

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
<p><i>Other Recommendations</i> (U.S. Fish and Wildlife Service 2010). The size of the buffer area surveyed will be based on the type of habitat present and line of sight from each improvement environmental footprint by segment to surrounding suitable breeding habitat. Buffer areas containing unsuitable nesting habitat or with an obstructed line of sight to the respective location of construction activity will not be surveyed. Biologists will focus on suitable nest trees within and immediately adjacent to construction areas that have the highest likelihood for disturbance. The number of surveys needed to determine the status of nesting will be dependent on the conditions during the surveys and behavior of the eagles. If needed, biologists will coordinate with USFWS regarding the extent and number of surveys. Surveys would generally be conducted between January and July. Survey methods and results will be reported to USFWS.</p> <p>If active nests are found, the Authority or its contractor will maintain a 0.5-mile buffer, or other distance determined appropriate through consultation with USFWS, between construction activities and the active nest(s) until it has been determined that young have fledged.</p>						Authority review prior to construction.	
<p>BIO-2.15: Protect Swainson’s hawk nests</p> <p>Prior to construction activities occurring between March 1 and September 15, focused surveys for nesting Swainson’s hawks will be conducted within 0.5 mile of, and inclusive of, the construction areas located in the Central Valley. The survey buffer may be smaller in areas where topography (e.g., hills) obstructs the line of sight from the Project footprint. Survey buffer areas lacking suitable nest trees or with an obstructed line of sight will not be surveyed. Biologists will focus on suitable nest trees within and immediately adjacent to the construction areas that have the highest likelihood for disturbance. The number of surveys needed to determine the status of nesting will be dependent on the conditions during the surveys and observed Swainson’s hawk behavior. Survey methods will follow those prescribed in <i>Recommended Timing and Methodology for Swainson’s Hawk Nesting Surveys in California’s Central Valley</i> (Swainson’s Hawk Technical Advisory Committee 2000) and generally be conducted between February and July. Survey methods and results will be reported to CDFW.</p> <p>If active nests are found, the Authority or its contractor will maintain a minimum of 0.25-mile no-disturbance buffer between construction activities and the active nest(s) until it has been determined that young have fledged. The buffer may be reduced in consultation with CDFW if a biological monitor demonstrates through daily observations (minimum of 2 hours before and during construction activity) that adults tending the nest (on eggs or feeding nestlings) are not disturbed by construction noise. If the biological monitor observes signs of adult agitation or stress from construction (e.g., alarm calling, flying away from nest when construction starts), construction activities will cease until the qualified biologist, in consultation with CDFW, increases the size of the no-disturbance buffer and/or determines that young have fledged.</p> <p>The no-disturbance buffer size will be adjusted, as needed, based on the professional judgment of a qualified biologist during biological monitoring and be based on site specific conditions (e.g. type of project activity, topography, individual tolerance of species etc.).</p>	Contractor	X	X			Authority shall include as contract requirement. Contractor shall prepare a biological resources avoidance and minimization plan for Authority review prior to construction.	Authority review and approval of biological resources avoidance and minimization plan prior to construction.
<p>BIO-2.16: Compensate for Swainson’s hawk foraging habitat loss</p> <p>The Authority will provide compensatory mitigation for Swainson’s hawk foraging habitat loss (i.e., replacement of existing grassland or agricultural field with new structures) in the Central Valley through or in an amount consistent with the SJMSCP.</p> <p>To compensate for impacts on Swainson’s hawk foraging habitat outside of the HCP coverage area, the Authority or its contractor will preserve offsite habitat management lands, as described in California Department of Fish and Game’s (now</p>	Authority shall implement compensatory mitigation for special-status species, as necessary.	X	X			Authority shall prepare a compensatory mitigation plan prior to construction and shall implement all required compensatory activities prior to the end of construction.	Authority shall report completion of the compensatory mitigation to the Authority Executive Director at the end of construction.

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
<p>CDFW) <i>Staff Report Regarding Mitigation for Impacts to Swainson's Hawks in the Central Valley of California</i> (California Department of Fish and Game 1994) at a 1:1 to 0.25:1 ratio (acreage preserved: acreage affected), depending on the distance between the affected areas and the nearest active nest. The location of the closest nest to a given segment in which impacts will occur will be identified during Swainson's hawk surveys conducted under Mitigation Measure BIO-2.15. If acceptable to CDFW, the Authority may alternatively or additionally purchase mitigation credits for Swainson's hawk foraging habitat from a CDFW-approved mitigation or conservation bank that offers service coverage for the impact location. If no active nests are found during the surveys, a search of the CNDDDB will be conducted, and CDFW will be contacted to determine the nearest active nest in relation to each construction site by segment.</p>							
<p>BIO-2.17: Protect burrowing owls and burrowing owl habitat</p> <p>Prior to any construction activity in burrowing owl nesting (February 1 through August 31) or wintering habitat, the Authority will retain a qualified wildlife biologist to conduct a preconstruction survey for burrowing owls.</p> <p>Burrowing owl take avoidance surveys will be conducted no less than 14 days prior to and 24 hours before initiating ground disturbance, pursuant to the California Department of Fish and Game's <i>Staff Report on Burrowing Owl Mitigation</i> (California Department of Fish and Game 2012). The survey will encompass construction areas with suitable burrowing owl habitat. The survey will include a search of all suitable nesting habitat (trees, shrubs, scrub, grassland). If any burrowing owls are found within the disturbance area, the Authority will notify CDFW and proceed under CDFW direction.</p> <p>If burrows occupied by western burrowing owl are found in a survey area that would be directly affected by vegetation removal or any other ground-disturbing activities, no-disturbance buffers will be established by a qualified biologist (experienced with avian nesting behavior) around the sites to avoid disturbance or destruction of the occupied burrows or active nests. The biologist, in coordination with the Authority, will consult with CDFW about the appropriate size of no-disturbance buffers. If disturbance cannot be avoided with implementing buffers, other appropriate avoidance and minimization measures will be discussed with CDFW. The methods and results of the surveys will be submitted to CDFW prior to the start of work.</p> <p>If active nests or burrows are not detected during the surveys, additional measures will not be required and construction will proceed.</p> <p>If construction is planned to occur during the nesting season (February 1 through August 31), Authority will retain a qualified wildlife biologist to conduct a breeding season burrowing owl survey in the year prior to construction. The survey will be conducted to determine if there is a breeding pair within approximately 500 feet of the environmental footprint, unless the biologist determines that a smaller survey buffer around the Project footprint is warranted, based on pre-existing background disturbance and conditions. Survey visits will be timed in accordance with CDFW guidelines (California Department of Fish and Game 2012). This will provide the Project team advance notice of nesting owls in the construction area and allow ample time to discuss appropriate avoidance measures with CDFW.</p>	Contractor	X	X			<p>Authority shall include as contract requirement.</p> <p>Contractor shall prepare a biological resources avoidance and minimization plan for Authority review prior to construction.</p> <p>Authority review and approval of biological resources avoidance and minimization plan prior to construction.</p>	
<p>BIO-2.18: Compensate for burrowing owl habitat loss</p> <p>The Authority will provide compensatory mitigation for burrowing owl habitat loss through, or in amounts consistent with, either the SJMSCP or the EACCS, depending on the impact locality, or as agreed upon with CDFW.</p>	Authority shall implement compensatory mitigation for special-status species, as necessary.	X	X	X		<p>Authority shall prepare a compensatory mitigation plan prior to construction and shall implement all required</p> <p>Authority shall report completion of the compensatory mitigation to the Authority Executive</p>	

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<p>For impacts on burrowing owl habitat that occur outside of the SJMSCP and EACCS coverage areas (i.e., western Alameda County), the Authority will provide compensatory mitigation for the loss of occupied owl habitat before construction impacts occur. Occupancy of owl habitat will be determined during implementation of Mitigation Measure BIO-2.17, in the area that will be permanently affected.</p> <p>Compensatory mitigation may occur in the form of mitigation credit purchase from a CDFW-approved bank with burrowing owl habitat credits and/or preservation of suitable habitat. Mitigation credit purchase or habitat preservation will occur at a 3:1 ratio (compensation area to habitat loss area).</p> <ul style="list-style-type: none"> Habitat preservation will require the development and implementation of a management plan with the following success criteria to ensure the preserved area is managed as suitable burrowing owl habitat in perpetuity: Perform routine mowing or grazing to maintain vegetation height consistent with burrowing owl habitat requirements. Conduct biological monitoring surveys to confirm suitable owl habitat conditions and document ground squirrel and burrowing owl presence for a minimum of 5 years. Restrict deeds to maintain and manage the preserve for burrowing owl in perpetuity, with the ability to grant the preserve to the EACCS Conservancy or to the SJMSCP Joint Powers Authority. Preserve maintenance and funding reserves. 					compensatory activities prior to the end of construction.	Director at the end of construction.	
<p>BIO-2.19: Protect special-status and non-special-status roosting bats</p> <p>Where feasible, construction activities that have potential to affect bats with potential to occur within the construction site (i.e., pallid bat, Townsend’s big-eared bat, western mastiff bat, hoary bat, other common species of bats) will be conducted outside of the maternity season of bats (April 1 to September 15) and prior to the beginning of the hibernation period (November 1).</p> <p>Measures to avoid and minimize impacts on sensitive bats species will be determined in coordination with CDFW and may include the following:</p> <p>Trees</p> <ul style="list-style-type: none"> To avoid and minimize impacts on maternity roosts and hibernating bat species, trees will be removed or trimmed between September 1 and October 30. A qualified biologist (i.e., a biologist with experience with tree-roosting habitats and life histories of local bats) will examine trees for suitable bat roosting habitat (e.g., large tree cavities, loose or peeling bark, basal hollows, large snags) 7 to 14 days before tree removal or trimming. Trees will also be evaluated to determine if they provide suitable habitat for foliage-roosting bats. If the biologist determines that trees to be removed or trimmed provide suitable bat roosting habitat, the biologist will monitor tree removal/trimming. The biologist will make recommendations to implement measures to avoid and minimize disturbance or mortality of bats, such as conducting trimming and removal in the late afternoon or evening when it is closer to the time that bats would normally arouse, removing the tree in pieces rather than felling an entire tree, and gently shaking each tree with construction equipment and waiting several minutes before felling trees or removing limbs to allow bats time 	Contractor	X	X		<p>Authority shall include as contract requirement.</p> <p>Contractor shall prepare a biological resources avoidance and minimization plan for Authority review prior to construction.</p>	<p>Authority review and approval of biological resources avoidance and minimization plan prior to construction.</p>	

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
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<p>to arouse and leave the tree. The biologist will search downed vegetation for dead and injured bats. The presence of dead or injured bats that are species of special concern will be reported to CDFW. The biologist will prepare a biological monitoring report, which will be provided to the Project lead and CDFW.</p> <p>Human-made Structure and Natural Structures</p> <ul style="list-style-type: none"> • At least 30 days prior to structure removal or disturbance, a bat biologist will conduct an initial daytime survey to assess the structure for potential bat roosting habitat and look for bat sign (e.g., guano, urine staining). The biologist will examine the entire structure (i.e., inside and outside for human-made structure and all cracks, seams, and fissures for natural structures) for potential roosting habitat as well as routes of entry to the structure. • If no habitat or limited habitat for roosting bats is present and no signs of bat use are present, a preconstruction survey of the entire structure by qualified biologists will be conducted within 24 hours of demolition. • If signs of bat use are found or if all areas of the structure cannot be examined and the structure provides moderate or high potential habitat, the bat biologist will prepare a memo with recommended measures to exclude bats from using the structure as a roost site. The memo will include recommendations for excluding bats from using the structure to roost, such as sealing off entry points or using lights and other means to deter bats. The memo will include specifications on when and how exclusion measures should be implemented and will be provided to the Project lead and CDFW. 							
<p>BIO-2.20: Protect riparian brush rabbit</p> <p>The Authority will retain a USFWS- and CDFW-approved biologist to conduct surveys of riparian habitat in and within 250 feet of the Tracy to Lathrop (Paradise Cut to the San Joaquin River) segment to determine presence or absence of riparian brush rabbit no more than 5 days before construction. The biologist will identify and flag nest locations during this initial survey. Five days will allow time for the biologist to inform the Authority and its contractor where construction would occur within or near occupied habitat and develop a schedule for the biologist to monitor construction activities in these areas. To the extent feasible, a 250-foot no-disturbance buffer will be established around habitat determined to be occupied by either species. If occupied habitat is determined to be present within the construction area, and will be affected by construction or vegetation removal activities, then the approved biologist will monitor all unavoidable construction activities within occupied habitat to avoid injuring or killing any individuals present or destroying any nests. If occupied nests are located within the Project footprint, CDFW and USFWS will be consulted to determine nest relocation or other alternatives to avoid mortality or active nest destruction. The biologist will prepare a report documenting the results of construction monitoring, which will be provided to the Authority, CDFW, and USFWS.</p>	Contractor	X	X			<p>Authority shall include as contract requirement.</p> <p>Contractor shall prepare a biological resources avoidance and minimization plan for Authority review prior to construction.</p>	<p>Authority review and approval of biological resources avoidance and minimization plan prior to construction.</p>
<p>BIO-2.21: Compensate for riparian brush rabbit habitat loss</p> <p>The Authority will provide compensatory mitigation for riparian brush rabbit habitat loss through or in an amount consistent with the Authority for impacts within San Joaquin County.</p> <p>For impacts on riparian brush rabbit habitat that occur outside of the SJMSCP coverage area, the Authority will provide compensatory mitigation for the loss of occupied riparian brush rabbit habitat, as agreed upon with USFWS and CDFW, before construction impacts occur. The occupancy of suitable habitat will be determined during implementation of Mitigation Measure BIO-2.20. Compensatory mitigation may occur in the form of mitigation credit purchase from a USFWS- and CDFW-</p>	Authority shall implement compensatory mitigation for special-status species, as necessary.	X	X	X		<p>Authority shall prepare a compensatory mitigation plan prior to construction and shall implement all required compensatory activities prior to the end of construction.</p>	<p>Authority shall report completion of the compensatory mitigation to the Authority Executive Director at the end of construction.</p>

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
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<p>approved bank with riparian brush rabbit and riparian woodrat habitat credits or preservation and enhancement of suitable habitat. Mitigation credit purchase or habitat preservation and enhancement will occur at a 3:1 ratio (compensation area to habitat loss area).</p> <p>Habitat preservation and enhancement will require the development and implementation of a management plan with the success criteria listed below to ensure that the preserved area is managed as suitable riparian brush rabbit habitat in perpetuity. Compensatory riparian habitat mitigation is inclusive of other riparian habitat mitigation described below, including the following measures:</p> <ul style="list-style-type: none"> • Perform routine eradication of invasive species to maintain the intended vegetation diversity and structural strata consistent with riparian brush rabbit habitat requirements. • Conduct biological monitoring surveys to confirm suitable riparian brush rabbit habitat conditions and document riparian vegetation presence and maturity for a minimum of 10 years. • Restrict deeds to maintain and manage the preserve for riparian brush rabbit in perpetuity, with the ability to grant the preserve to a habitat conservancy, public agency, or other local habitat management entity. • Preserve maintenance and funding reserves. 							
<p>BIO-2.22: Protect American badger, San Joaquin kit fox, mountain lion, and their habitat.</p> <p><u>American badger and San Joaquin kit fox</u></p> <p>Within 1 year but no less than 3 months prior to initiating construction at the Altamont and Tracy to Lathrop segments, the Authority will retain a qualified biologist to identify potential San Joaquin kit fox dens in the Project footprint and surrounding 200 feet in accordance with the <i>Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance</i> (2011 USFWS Standard Recommendations) (U.S. Fish and Wildlife Service 2011). USFWS and CDFW will be consulted in the final survey design and will be given the environmental footprints. This survey will also identify potential American badger dens. The biologist will prepare a report summarizing the survey observations and results, including maps depicting the locations of potential kit fox dens and badger dens and, if possible, occupancy. The report will be submitted to the Authority, USFWS, and CDFW.</p> <p>Different San Joaquin kit fox den types will be defined, per the 2011 USFWS guidance:</p> <p>Known Den—Any existing natural den or human-made structure that is used or has been used at any time in the past by a San Joaquin kit fox. Evidence of use may include historical records; past or current radio telemetry or spotlighting data; kit fox sign, such as tracks, scat, and/or prey remains; or other reasonable proof that a given den is being or has been used by a kit fox. The [U.S. Fish and Wildlife] Service discourages use of the terms “active” and “inactive” when referring to any kit fox den because a great percentage of occupied dens show no evidence of use and kit foxes change dens often, with the result that the status of a given den may change frequently and abruptly.</p> <p>Potential Den—Any subterranean hole within the species’ range that has entrances of appropriate dimensions for which available evidence is insufficient to conclude that it is being used or has been used by a kit fox. Potential dens will include the following: (1) any suitable subterranean hole or (2) any den or burrow of another species (e.g., coyote, badger, red fox, ground</p>	Contractor	X	X		<p>Authority shall include as contract requirement.</p> <p>Contractor shall prepare a biological resources avoidance and minimization plan for Authority review prior to construction.</p>	<p>Authority review and approval of biological resources avoidance and minimization plan prior to construction.</p>	

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<p>squirrel) that otherwise has appropriate characteristics for kit fox use.</p> <p>Natal or Popping Den—Any den used by kit foxes to whelp and/or rear their pups. Natal/popping dens may be larger, with more numerous entrances, than dens occupied exclusively by adults. These dens typically have more kit fox tracks, scat, and prey remains in the vicinity of the den and may have a broader apron of matted dirt and/or vegetation at one or more entrances. A natal den, defined as a den in which kit fox pups are actually whelped but not necessarily reared, is a more restrictive version of the pupping den. In practice, however, it is difficult to distinguish between the two; therefore, for purposes of this definition, either term applies.</p> <p>Prior to construction, the Authority will retain qualified biologists to implement preconstruction surveys of previously identified potential kit fox dens to determine if they are known dens, natal or pupping kit fox dens, or American badger dens. As per the 2011 USFWS Standard Recommendations, preconstruction surveys are to be conducted no less than 14 days and no more than 30 days before the initiation of construction at each environmental footprint (e.g., 1 week ahead of the construction crew for linear components). Construction activities will not occur within 100 feet of a potential den during the natal period (February 1 to September 30). If a known den or natal or pupping den is present and located 100 feet outside of the permanent Project footprint, then a 200-foot no-disturbance exclusion zone during the natal period (100-foot buffer during the non-natal period) will be established around the den, with orange construction fence at the edge of the disturbance limits nearest the den. If a known den or natal or pupping den is present within the permanent Project footprint or within 200 feet of the Project footprint during the natal period (100-foot buffer during the non-natal period), the foxes or badger(s) will be excluded outside of the natal period (from November 1 to January 31). A summary report will be prepared by the biologists and submitted to the Authority, CDFW, and USFWS following completion of all fox and badger avoidance and exclusion activities.</p> <p>Mountain lion</p> <p><i>Implementation of some of these measures may require that the Authority obtain an ITP from CDFW if mountain lion remains a candidate or is formally listed under CESA before construction begins. Additional conservation measures or conditions of approval may be required in applicable project permits (e.g., CESA ITP).</i></p> <p>Within 1 year but no less than 3 months prior to initiating construction, the Authority will retain a qualified biologist to identify known and potential wildlife corridors, wildlife crossings, and known mountain lion movement data in the Project footprint and surrounding 5 miles. Qualified biologist(s) will identify potential mountain lion movement areas, potential denning areas, and compile mountain lion movement and territory data from mountain lion telemetry and other studies, followed by camera and track surveys to determine the location of transit areas, communication posts, and potential denning areas. Based on research documenting mountain lion avoidance behavior of human disturbance and roads, camera and track surveys would be conducted within 2,000 feet of the Project footprint (Wilmers et al. 2013). CDFW will be consulted in the final survey design and will be given the environmental footprints. The biologists will prepare a report summarizing the survey observations and results, including maps depicting the locations of potential mountain lion use area and den sites and, if possible, occupancy. The report will be submitted to the Authority and CDFW.</p> <p>Mountain lion den types will be defined as follows (terminology generally consistent with the 2011 USFWS guidance for San Joaquin kit fox),</p> <p>Known Den—Any existing natural den or human-made structure that is used or has been used at any time in the past by a</p>							

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<p>mountain lion. Evidence of use may include historical records; past or current radio telemetry or tracking study data; mountain lion sign, such as tracks, scat, and/or prey remains; or other reasonable proof that a given den is being or has been used by a mountain lion. USFWS discourages use of the terms "active" and "inactive" with other species when referring to any den because denning animals may change dens often, with the result that the status of a given den may change frequently and abruptly. Mountain lions may move the litter to one or more additional den sites throughout her home range by the time kittens are weaned at 2 to 3 months (Pierce and Bleich 2003).</p> <p>Potential Den—Any thick vegetation, boulder piles, rocky outcrops or undercut cliffs within the species' range for which available evidence is insufficient to conclude that it is being used or has been used by a mountain lion (Logan and Sweanor 2001). Potential dens will include the following characteristics: (1) refuge from predators (e.g., coyotes, golden eagles, other cougars) or (2) shielding of litter from heavy rain and hot sun.</p> <p>Prior to construction, the Authority will retain qualified biologists to implement preconstruction surveys of previously identified potential mountain lion dens to determine if mountain lion sign is in the vicinity. Preconstruction surveys are to be conducted no less than 14 days and no more than 30 days before the initiation of construction at each environmental footprint (e.g., 2 weeks ahead of the construction crew for linear components). Construction activities will not occur within 2,000 feet of a potential den during the breeding and natal period (February 1 to September 30). If a known den is present within the permanent Project footprint or within 2,000 feet of the Project footprint, consultation with CDFW will occur. A summary report will be prepared by the biologist(s) and submitted to the Authority and CDFW following completion of all mountain lion avoidance and minimization activities.</p> <p>If special-status mammal species are determined to not be present in the Project area or a qualified biologist (experienced with predatory mammals) concludes that there is a very low likelihood that the special-status mammal species is present, then no additional mitigation is required. If special-status mammal species are determined to be present in the Project area, then the Project proponent will implement Mitigation Measure BIO-2.23.</p>							
<p>BIO-2.23: Compensate for American badger, San Joaquin kit fox, and mountain lion habitat loss.</p> <p>If it is determined through preconstruction surveys conducted pursuant to Mitigation Measure BIO-2.22 that special-status mammal species (i.e., American badger, San Joaquin kit fox, and/or mountain lion) are present within the Project area, the following measures will be implemented to ensure that the Proposed Project does not have a significant impact on American badger, San Joaquin kit fox, and/or mountain lion.</p> <p><u>American badger and San Joaquin kit fox</u></p> <p>The Authority will provide compensatory mitigation for San Joaquin kit fox and American badger habitat loss through, or in an amount consistent with, either the EACCS or SJMSCP for impacts within Alameda County and San Joaquin County (see Mitigation Measure BIO-2.1).</p> <p>For impacts on San Joaquin kit fox and American badger habitat that occur outside of the EACCS or SJMSCP coverage area, the Authority will provide compensatory mitigation for the loss of occupied San Joaquin kit fox and American badger habitat as agreed upon with USFWS and CDFW before construction impacts occur. The occupancy of suitable habitat will be determined during implementation of Mitigation Measure BIO-2.22. Compensatory mitigation may occur in the form of mitigation credit purchase from a USFWS- and CDFW-approved bank with San Joaquin kit fox habitat credits or preservation and enhancement</p>	Authority shall implement compensatory mitigation for special-status species, as necessary.	X	X	X	Authority shall prepare a compensatory mitigation plan prior to construction and shall implement all required compensatory activities prior to the end of construction.	Authority shall report completion of the compensatory mitigation to the Authority Executive Director at the end of construction.	

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<p>of suitable habitat. Mitigation credit purchase or habitat preservation and enhancement will occur at a 3:1 ratio (compensation area to habitat loss area).</p> <p>Habitat preservation and enhancement will require the development and implementation of a management plan with the following success criteria to ensure the preserved area is managed as suitable San Joaquin kit fox and American badger habitat in perpetuity:</p> <ul style="list-style-type: none"> • Conduct routine eradication of invasive species to maintain the intended vegetation diversity, density, and height consistent with San Joaquin kit fox and American badger habitat requirements for a minimum of 5 years. • Conduct biological monitoring surveys to confirm suitable San Joaquin kit fox and American badger habitat conditions and document ground squirrel presence. • Restrict deeds to maintain and manage the preserve for San Joaquin kit fox and American badger in perpetuity, with the ability to grant the preserve to a habitat conservancy, public agency, or other local habitat management entity. • Preserve maintenance and funding reserves. <p><u>Mountain lion</u></p> <p>The Authority will provide compensatory mitigation for mountain lion habitat loss as agreed upon with CDFW before construction impacts occur. Compensatory mitigation may be in the form of mitigation credit purchase from a CDFW-approved bank, preservation and enhancement of suitable habitat, or other agreed-upon form of mitigation.</p> <p>Habitat preservation and enhancement will require the development and implementation of a management plan with the following success criteria to ensure the preserved area is managed as suitable mountain lion habitat in perpetuity.</p> <ul style="list-style-type: none"> • Conduct routine inspection and maintenance of existing wildlife crossings and new wildlife crossing options along the Altamont Alignment and the Stone Cut Alignment and portions of the Tracy to Lathrop Alignment. • Conduct routine eradication of invasive plant species to maintain the intended vegetation diversity, density, and height consistent with maintaining native faunal population habitat requirements for a minimum of 5 years. • Conduct biological monitoring surveys of habitat preserved and/or enhanced to confirm suitability for mountain lion habitat conditions. • Document species presence and use of preserved habitat. • Restrict deeds to maintain and manage the preserve for mountain lion in perpetuity, with the ability to grant the preserve to a habitat conservancy, public agency, or other local habitat management entity. • Preserve maintenance and funding reserves. 	Contractor	X	X			Authority shall include as contract requirement. Contractor shall prepare a	Authority review and approval of biological resources avoidance and minimization plan prior to
<p>BIO-2.24: Protect Crotch bumble bee and western bumble bee nesting habitat and floral resources</p> <p><i>Implementation of some of these measures may require that the Authority obtain an ITP from CDFW if Crotch bumble bee and western bumble bee remain candidates or are formally listed under CESA before construction begins.</i></p>							

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
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<p>Prior to the start of construction, qualified biologist(s) will conduct botanical surveys in late spring/early summer to identify and map concentrations of flowering plants that provide food resources for special-status bumble bees. The areas containing higher densities and varieties of flowering plants will be evaluated by a qualified invertebrate biologist to determine if these areas provide suitable foraging habitat for special-status bumble bees. The habitat evaluation surveys would follow recommendations in the Rusty Patched Bumble Bee Habitat Assessment Form and Guide (Xerces Society for Invertebrate Conservation 2017).</p> <p>If moderate to high quality foraging habitat for Crotch and/or western bumble bee is identified in the Project area based on the habitat evaluation, these areas will be surveyed by a qualified invertebrate biologist(s) (with experience conducting bumble bee surveys) within 1 year prior to the start of construction. Surveys would be conducted during four evenly spaced sampling periods during the flight season (March through September) (Thorp et al. 1983). For each sampling event, the biologist(s) would survey suitable habitat using nonlethal netting methods for 1 person-hour per 3 acres of the highest quality habitat or until 150 bumble bees are sighted, whichever comes first. If initial sampling of a given habitat area indicates that the habitat is of low quality or nonexistent, no further sampling of that area would be required. General guidelines and best practices for bumble bee surveys would follow USFWS' Survey Protocols for the Rusty Patched Bumble Bee (<i>Bombus affinis</i>) (U.S. Fish and Wildlife Service 2019c), which are consistent with other bumble bee survey protocols used by The Xerces Society (Hatfield et al. 2017; Washington Department of Fish and Wildlife et al. 2019).</p> <p>If special-status bumble bee is determined to not be present in the Project area or a qualified invertebrate biologist (experienced with bumble bees) concludes that there is a very low likelihood that the species is present, then no additional mitigation is required.</p> <p>If surveys identify occupied Crotch and western bumble bee habitat within the project footprint, the project biologist would then conduct additional preconstruction surveys of such habitat for active bee nest colonies and associated floral resources (i.e., flowering vegetation on which bees from the colony are observed foraging) no more than 30 days prior to any ground disturbance between March and September. The purpose of this preconstruction survey would be to identify active nest colonies and associated floral resources outside of permanent impact areas that could be avoided by construction personnel. The project biologist would establish, monitor, and maintain no-work buffers around nest colonies and floral resources identified during surveys. The size and configuration of the no-work buffer would be based on best professional judgment of the project biologist. At a minimum, the buffer would provide at least 20 feet of clearance around nest entrances and maintain disturbance-free airspace between the nest and nearby floral resources. Construction activities would not occur within the no-work buffers until the colony is no longer active (i.e., no bees are seen flying in or out of the nest for three consecutive days indicating the colony has completed its nesting season and the next season's queens have dispersed from the colony).</p>					biological resources avoidance and minimization plan for Authority review prior to construction.	construction.	
<p>BIO-2.25: Compensate for Crotch bumble bee and western bumble bee habitat loss</p> <p>If Crotch bumble bee and/or western bumble bee are formally listed under CESA, the Authority will work with CDFW to discuss compensatory mitigation for impacts on occupied habitat. At this time, compensatory mitigation for Crotch bumble bee and western bumble bee is not proposed.</p> <p>If and/or when compensatory mitigation is proposed, it may include the following activities and would be determined during consultation with CDFW.</p>	Authority shall implement compensatory mitigation for special-status species, as necessary.	X	X	X	Authority shall prepare a compensatory mitigation plan prior to construction and shall implement all required compensatory activities prior to the end of construction.	Authority shall report completion of the compensatory mitigation to the Authority Executive Director at the end of construction.	

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<ul style="list-style-type: none"> To encourage growth of additional nectar and pollen producing plants within the Project area, disturbed grasslands that are revegetated in accordance with Mitigation Measure BIO-7.2 will use a seed mix combination that includes nectar and pollen producing plants commonly used as a food source by Crotch and western bumble bee. Plants of the following genus are appropriate: <i>Cirsium</i> sp., <i>Erigeron</i> sp., <i>Solidago</i> sp., <i>Aster</i> sp., <i>Centaurea</i> sp., and <i>Penstemon</i> sp. These annual plants will be incorporated into the seed mix, as applicable for the existing habitat conditions. To minimize impacts on bees from herbicide drift, herbicide application around stations and rail facilities will be performed using handheld equipment and will be restricted to a 20-foot buffer around facility structures. The contractor will use an herbicide that has been shown to be less toxic to amphibians and invertebrates such as 2, 4 D. Herbicides containing the surfactant POEA, considered toxic to aquatic and terrestrial wildlife (Relyea 2011), will not be used in the Project area. The most current information on herbicide toxicity on wildlife will be used to inform future decisions about herbicide use during operations. Impacts on occupied habitat (confirmed through surveys as described in Mitigation Measure BIO-2.24) would be compensated for at a ratio of 3:1, unless a higher ratio is required pursuant to an authorization issued under CESA, through the purchase of CDFW-approved bank credits or through preservation of habitat in perpetuity, including suitable habitat currently preserved by the Authority. 							
<p>BIO-3.1: Develop and implement a hydroacoustic monitoring plan to minimize noise effects on fish</p> <p>The contractor will develop and implement a hydroacoustic monitoring plan. The monitoring plan will be submitted to the resource agencies (i.e., CDFW, NMFS, USFWS) for approval at least 60 days before the start of construction activities. The plan will include the following requirements:</p> <ul style="list-style-type: none"> The contractor will monitor underwater noise levels during all impact pile-driving activities on land and in water to ensure that that peak and cumulative SELs do not exceed estimated values. The monitoring plan will describe the methods and equipment that will be used to document the extent of underwater sounds produced by pile driving, including the number, location, distances, and depths of the hydrophones and associated monitoring equipment. The monitoring plan will include a reporting schedule that includes provision of daily summaries of the hydroacoustic monitoring results to the resource agencies and more comprehensive reports on a monthly basis during the pile-driving season. The reports will include the number of piles installed per day, the number of strikes per pile, the interval between strikes, the peak sound pressure level, SEL, root mean square per strike, and accumulated SEL per day at each monitoring station. 	Contractor	X	X		<p>Authority shall include as contract requirement.</p> <p>The Contractor shall prepare a noise reduction and monitoring plan, including hydroacoustic monitoring for Authority review.</p>	<p>Authority review of noise study and review and approval of noise reduction and monitoring plan prior to construction.</p>	

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
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<p>BIO-4.1: Protect nesting birds during maintenance activities</p> <p>The Authority or its contractor will conduct vegetation and structural maintenance activities associated with the operation of Valley Link outside of the bird nesting season (February 1 to September 15) to the extent feasible. If vegetation and structural maintenance during the nesting season is unavoidable, the Authority or its contractor will retain a qualified wildlife biologist with demonstrated nest-searching experience to conduct preconstruction surveys for nesting birds within 300 feet of the vegetation and structural maintenance locations. Adjacent lands outside the ROW will be scanned with binoculars, including any Project operations areas, the ROW, and/or publicly accessible areas. The preconstruction surveys will occur no more than 7 days prior to maintenance activities (including removing or trimming vegetation, modifying structures that provide nesting habitat, clearing ground, grubbing, staging) at each contiguous maintenance area.</p> <p>If active nests are found in the area to undergo maintenance activities, no-disturbance species-specific buffer zones will be established by the biologist and marked with high-visibility fencing, flagging, or pin flags. No maintenance activities will be allowed within the buffer zones. The size of the buffer will be based on the species' sensitivity to disturbance and planned work activities in the vicinity; typical buffer sizes are 250 feet for raptors and 50 feet for other birds (i.e., passerines). The buffer will remain in effect until the nest is no longer active, as determined by the biologist. Buffers for any nests found outside of the area to undergo maintenance activities, but within 250 feet of the maintenance location, will be established, based on the biologist's best professional judgment as to whether the work would result in nest disturbance and/or abandonment. If a lapse in maintenance activities of 7 days or longer at a previously surveyed area occurs, another preconstruction survey will be conducted.</p> <p>After all surveys activities are completed at each continuous maintenance activity area within a given segment (e.g., Tri-Valley, Altamont, Tracy to Lathrop), the biologist will complete a memorandum detailing the survey effort and results and submit the memorandum to the Authority within 7 days of survey completion.</p>	Authority, Project Operator				X	<p>The Authority will include requirements for vegetation maintenance contracts in accordance with this measure.</p> <p>The Project Operator will prepare vegetation management guidelines for the Project. For facilities within the UPRR ROW, Authority will coordinate with UPRR. After UPRR approval, the Project Operator will provide the guidelines to CDFW for approval.</p> <p>Vegetation maintenance guidelines shall only apply to areas in the vicinity of nesting birds and roosting bats.</p> <p>Project Operator to prepare annual vegetation maintenance monitoring reporting.</p>	<p>Project Operator completion of vegetation management guidelines and review by CDFW.</p> <p>Authority review of annual vegetation maintenance monitoring reports.</p>
<p>BIO-4.2: Protect roosting bats during maintenance activities</p> <p>The Authority or its contractor will conduct maintenance activities (e.g., operational tree removal and trimming, structure modification or removal) in roosting bat habitat from September 15 to October 30 to the extent feasible to avoid maternity bat roosts, roosting bats in torpor (reduced metabolic function, similar to hibernation), or nonvolant (flightless) young. If operational maintenance activities cannot be conducted between September 15 and October 30, the Authority or its contractor will retain qualified biologists who will examine structures to be removed or modified and trees to be removed or trimmed for suitable bat roosting habitat no more than 2 weeks before conducting the maintenance activity. High-quality habitat features (large tree cavities, basal hollows, loose or peeling bark, larger snags, palm trees with intact thatch, seams, weep holes, crevices on sides of buildings) will be identified and the area around these features searched for bats and bat signs (e.g., guano, culled insect parts, urine staining). Riparian woodland, orchards, and stands of mature broadleaf trees should be considered potential habitat for solitary foliage-roosting bat species. Passive monitoring using full spectrum bat detectors may be needed if identification of bat species is required. Survey methods will be discussed with CDFW prior to the start of surveys.</p> <p>Measures to avoid and minimize impacts on sensitive bats species will be determined in coordination with CDFW and may include the following:</p> <p>Tree removal, tree trimming, structure modification, or removal of trees that provide suitable habitat for bats will be avoided</p>	Authority, Project Operator				X	<p>The Authority will include requirements for vegetation maintenance contracts in accordance with this measure.</p> <p>The Project Operator will prepare vegetation management guidelines for the Project. For facilities within the UPRR ROW, the Project Operator will coordinate with UPRR. After UPRR approval, the Project Operator will provide the guidelines to CDFW for approval.</p> <p>Vegetation maintenance guidelines shall only apply to</p>	<p>Project Operator completion of vegetation management guidelines and review by CDFW.</p> <p>Authority review of annual vegetation maintenance monitoring reports.</p>

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
<p>between April 1 and September 15 (the maternity period) to avoid effects on pregnant females and active maternity roosts (whether colonial or solitary).</p> <p>Tree removal, tree trimming, structure modification, or removal of trees that provide suitable habitat for bats will be conducted between September 15 and October 30, which corresponds to a time period when bats have not yet entered torpor or caring for nonvolant young.</p> <p>Trees that provide suitable habitat for bats will be removed in pieces rather than felling the entire tree.</p> <p>Trees and tree limbs that do not provide habitat will be removed prior to removing trees and limbs that do provide roosting habitat.</p> <p>If possible, tree trimming and removal should occur in the late afternoon or evening when it is closer to the time that bats would normally arouse. Prior to removal and trimming, each tree will be shaken gently and several minutes will pass before felling trees or limbs to allow bats time to arouse and leave the tree.</p> <p>If a maternity roost is located, whether solitary or colonial, that roost will remain undisturbed until September 15 or until a qualified biologist has determined the roost is no longer active.</p> <p>If avoidance of a non-maternity roost site is not possible, and the maintenance activity must occur between October 30 and September 15, qualified biologists will monitor the maintenance activity that has the potential to affect roosting bat habitat. The biologists will search downed vegetation and debris for dead and injured bats. The presence of dead or injured bats that are species of special concern, or candidate threatened or endangered species, will be reported to CDFW. The biologist will prepare a biological monitoring report, which will be provided to the Authority and CDFW no more than 30 days following the completion of all bat surveys.</p>						<p>areas in the vicinity of nesting birds and roosting bats.</p> <p>Project Operator to prepare annual vegetation maintenance monitoring reporting.</p>	
<p>BIO-4.3: Minimize permanent intermittent impacts on avian and bat wildlife species due to the Altamont OCS and aerial structures</p> <p>The Authority will implement an array of deterrent and diversion features for avian species. These features include the following:</p> <ul style="list-style-type: none"> • Install pigeon wire or other features to discourage birds from perching on the Altamont OCS poles. • Modify Altamont OCS poles to preclude bird and/or bat entrapment in hollow poles and at the top of poles (e.g., avoid the use of tubular poles or cap openings in all poles) • Design aerial structures to discourage bats from roosting in expansion joints or other crevices. 	Contractor				X	<p>Authority shall include as contract requirement.</p> <p>Contractor shall design deterrent and diversion features.</p>	<p>Authority review and approval of design for deterrent and diversion features.</p>
<p>BIO-4.4: Implement removal of carrion that may attract raptors and carnivores</p> <p>During operations in raptor foraging areas, the Authority or its contractor will implement a program of track inspections and reporting to detect the presence of a carcass (carrion) within the ROW that could be an attractant to raptors and other carrion eating birds. Dead and injured wildlife found in the ROW will be removed as soon as safely feasible. This measure would apply to the Altamont Pass.</p>	Project Operator				X	<p>The Authority will include requirements in operational contracts in accordance with this measure.</p> <p>Project Operator shall develop inspection and monitoring</p>	<p>Authority review and approval of inspection and monitoring protocols.</p>

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
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<p>BIO-4.5: Avoid use of second-generation anticoagulant rodenticides</p> <p>During operations, the Authority or its contractor will avoid the use of second-generation anticoagulant rodenticides, such as brodifacoum, bromadiolone, difenacoum, and difethialone in Central Coast mountain lion, San Joaquin kit fox, American badger, and burrowing owl habitat areas. The Authority will limit the use of other pesticides and herbicides that may have negative effects on special-status wildlife species.</p>	Project Operator				X	<p>The Authority will include requirements in operational contracts in accordance with this measure.</p> <p>Project Operator shall develop protocols for rodenticide, pesticide, and herbicide use.</p>	Authority review and approval of protocols for rodenticide, pesticide, and herbicide use.
<p>BIO-6.1: Compensate for impacts on jurisdictional wetlands and non-wetland waters of the United States (aquatic resources) prior to impacts during construction</p> <p>The Authority will develop an aquatic resource (wetlands and non-wetland waters of the United States) mitigation plan, subject to approval by the resource agencies, which will ensure no net loss of wetlands. The plan will detail the amount and type of wetlands that will be compensated for impacts on existing wetlands and non-wetland waters of the United States. The plan will also outline the monitoring and success criteria for the compensation wetlands and non-wetland waters of the United States. Additional enhancement options include fish barrier removal, riparian restoration, floodplain restoration, and streambank layback to improve overall ecologic function and connectivity of wetland and non-wetland waters. Enhancement sites will be located as near to the impact location as possible but, in the event that local enhancement opportunities are not available, such activities will occur within the same stream system or watershed to provide improved ecologic function and connectivity for wetlands and non-wetland waters affected by the Proposed Project.</p> <ul style="list-style-type: none"> Monitoring and success criteria applicable to created or restored wetlands will require the following: At least two surveys by a qualified wetland biologist, botanist, or ecologist per monitoring year. At least 80 percent of the created or restored features support vegetation, consistent with reference feature conditions. At least 80 percent of the created or restored features support hydrologic regimes, similar to reference feature conditions. A minimum of 5 consecutive years of monitoring to ensure success criteria are met. Remedial actions to restore intended ecological function of created or restored features that fail to meet the success criteria for 3 consecutive years. <p>Once the plan is approved, the Authority will implement the aquatic resource compensation measures prior to the initiation of construction. The Authority will be responsible for funding compensatory mitigation, monitoring of the created or restored features per the mitigation plan, and any remedial actions necessary. All conditions that are attached to the state and federal permits will be implemented. The conditions will be clearly identified in the construction plans and specifications and monitored during and after construction to ensure compliance.</p>	Contractor	X	X	X		<p>Authority shall include as contract requirement.</p> <p>Contractor shall prepare an aquatic resource mitigation plan and obtain approval from the regulatory agencies prior to the end of construction.</p> <p>Contractor shall implement the aquatic resource mitigation plan at the same time as construction.</p> <p>Post-construction monitoring shall be performed for a minimum of 5 consecutive years, as necessary.</p>	<p>Authority review and approval of aquatic resource mitigation plan.</p> <p>Regulatory agency approval of aquatic resource mitigation plan.</p> <p>Authority to submit annual monitoring reports to regulatory agencies.</p> <p>Authority will report completion of this measure to the Authority Executive Director.</p>

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
<p>BIO-7.1: Compensate for loss of riparian habitat</p> <p>For direct effects on woody riparian trees that cannot be avoided, the Authority will compensate for the loss of riparian habitat to ensure no net loss of habitat functions and values. Compensation ratios will be based on site-specific information and determined through coordination with the appropriate state and federal agencies during the permitting process. At a minimum, the compensation ratio will be 2:1 (e.g., 2 acres restored/created/enhanced or credits purchased for every 1 acre removed) for permanent impacts and 1:1 for temporary impacts (where riparian habitat will regenerate to pre-activity character within 1 year). Compensation may be a combination of offsite restoration or mitigation credits. The Authority or its contractor will develop a restoration and monitoring plan that describes how riparian habitat will be enhanced or recreated and monitored over at least 5 years, or as determined by the appropriate state and federal agencies.</p> <p>If the Authority identifies suitable onsite areas (adjacent to the permanent Project footprint) that are outside the ROW vegetation management zone and chooses to compensate onsite or in the Project vicinity, a revegetation plan will be prepared. The revegetation plan will be developed prior to the removal of existing riparian vegetation and conducted onsite or in the Project vicinity to the extent feasible. The revegetation plan will be prepared by a qualified botanist or restoration specialist with experience in riparian restoration and reviewed by the appropriate agencies. The revegetation plan will specify the planting stock appropriate for each riparian land cover type and each mitigation site, ensuring the use of genetic stock from the corresponding Project area by segment. The plan will employ the most successful techniques available at the time of planting. Success criteria will be established as part of the plan and will include a minimum of 70 percent revegetation success after 3 years, 80 percent revegetation success at the end of 5 years, and 75 percent vegetative coverage after 5 years.</p> <p>The Authority or its contractor will retain a qualified botanist, restoration ecologist, or biologist with experience in riparian restoration to monitor the plantings as necessary for 5 years. The Authority or its contractor will be responsible for maintaining the plantings, including managing invasive plants (as defined by the California Invasive Plant Council) and other weeds and implementing irrigation and plant protection if necessary. The Authority or its contractor will submit annual monitoring reports to the regulatory agencies issuing permits related to habitat effects, including CDFW, USACE, NMFS, and USFWS. Replanting will be necessary if success criteria are not met, and replacement plants will be monitored and maintained subsequently to meet the success criteria. The riparian habitat mitigation will be considered successful when the sapling trees established meet the success criteria, the habitat no longer requires substantial active management, and vegetation is arranged in groups that, when mature, replicate the area, natural structure, stratification, and species composition of similar riparian habitats in the region.</p>	Contractor	X	X	X	<p>Authority shall include as contract requirement.</p> <p>Contractor shall prepare a riparian habitat restoration and monitoring plan and obtain approval from regulatory agencies prior to construction.</p> <p>Contractor shall implement the riparian habitat restoration and monitoring plan at the same time as construction.</p> <p>Post-construction monitoring shall be performed for a minimum of 5 years, as necessary.</p>	<p>Authority review and approval of riparian habitat restoration and monitoring plan.</p> <p>Regulatory agency approval of riparian habitat restoration and monitoring plan.</p> <p>Authority to submit annual monitoring reports to regulatory agencies.</p> <p>Authority will report completion of this measure to the Authority Executive Director.</p>	
<p>BIO-7.2: Compensate for loss of sensitive natural communities (excluding riparian and wetland habitat)</p> <p>For direct effects on non-riparian sensitive natural communities (e.g., salt grass flats) that cannot be avoided, the Authority will compensate for the loss of these communities to restore habitat functions and values. Compensation ratios will be based on site-specific information and determined through coordination with the appropriate state and federal agencies during the permitting process. Compensation will be based on the ratio determined in coordination with appropriate state and federal agencies. At a minimum, the compensation ratio for affected sensitive natural communities will be 2:1 (e.g., 2 acres restored/created/enhanced or credits purchased for every 1 acre removed) for permanent impacts and 1:1 for temporary impacts (where a sensitive natural community will regenerate to pre-activity character within 1 year). Compensation may be a combination of offsite restoration or mitigation credits. The Authority or its contractor will develop a restoration and monitoring</p>	Contractor	X	X	X	<p>Authority shall include as contract requirement.</p> <p>Contractor shall prepare a sensitive natural communities restoration and monitoring plan and obtain approval from regulatory agencies prior to construction.</p> <p>Contractor shall implement the</p>	<p>Authority review and approval of sensitive natural communities restoration and monitoring plan.</p> <p>Regulatory agency approval of sensitive natural communities restoration and</p>	

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
<p>plan that describes how affected sensitive natural communities will be enhanced or recreated and monitored over at least 5 years, as determined by the appropriate state and federal agencies.</p> <p>If the Authority identifies suitable onsite areas (adjacent to the permanent Project footprint) that are outside the ROW vegetation management zone and chooses to compensate onsite or in the Project vicinity, a revegetation plan will be prepared. The revegetation plan will be developed prior to the removal of existing vegetation within the sensitive natural community and conducted onsite or in the Project vicinity to the extent feasible. The revegetation plan will be prepared by a qualified botanist or restoration specialist with experience in corresponding sensitive natural communities and reviewed by the appropriate agencies. The revegetation plan will specify the seed or seedbank harvest prior to construction impacts; reference site selection for each sensitive natural community to be affected; propagation methods or seed application, depending on the target species' requirements; and replanting methods appropriate for each sensitive natural community affected and each mitigation site, ensuring the use of genetic stock from the corresponding Project area by segment. The plan will employ the most successful techniques available at the time of planting. Success criteria will be established as part of the plan and include a minimum of 70 percent revegetation success after 3 years, 80 percent revegetation success at the end of 5 years, and 75 percent vegetative coverage consistent with appropriate reference conditions after 5 years.</p> <p>The Authority or its contractor will retain a qualified botanist, restoration ecologist, or biologist with experience in corresponding sensitive natural communities to monitor the plantings or vegetation growth as necessary for 5 years. The Authority or its contractor will be responsible for maintaining the sensitive natural community and associated plantings, including managing invasive plants (as defined by the California Invasive Plant Council) and other weeds and implementing irrigation and plant protection if necessary. The Authority or its contractor will submit annual monitoring reports to the regulatory agencies with jurisdiction of such sensitive natural communities, including CDFW, USACE, and USFWS. Replanting or reseeding will be necessary if success criteria are not met, and replacement plant growth will be monitored and maintained subsequently to meet the success criteria. Each area and type of sensitive natural community mitigation will be considered successful when the vegetation established meets the success criteria, the habitat no longer requires substantial active management, and vegetation grows such that, when mature, it replicates the natural structure, stratification, and species composition of appropriate reference sites in the region.</p>					<p>sensitive natural communities restoration and monitoring plan at the same time as construction.</p> <p>Post-construction monitoring shall be performed for a minimum of 5 years, as necessary.</p>	<p>monitoring plan.</p> <p>Authority to submit annual monitoring reports to regulatory agencies.</p> <p>Authority will report completion of this measure to the Authority Executive Director.</p>	
<p>BIO-8.1: Design curbs to permit California tiger salamander and California red-legged frog movement</p> <p>The Authority will design all curbs associated with the Isabel Station and Interim OMF to be rounded, with no vertical component exceeding 1 inch tall, to permit salamander movement between habitat areas.</p>	Contractor	X	X		<p>Authority shall include as contract requirement.</p> <p>Contractor shall design curbs according to this mitigation.</p>	<p>Authority review and approval of curb designs.</p>	
<p>BIO-8.2: Install station lighting controls and fencing limitations</p> <p>This mitigation measure applies to the following stations, which are in or adjacent to sensitive habitat: parking lot of Greenville Station, parking lot of Isabel Station, Interim OMF, Mountain House Station Alternative, Tracy OMF, River Islands Station, and North Lathrop Station.</p> <p>Lighting will be designed to have controls that limit nighttime lighting to the minimum necessary. All lighting will be focused and downward facing to limit illuminated areas to only the platforms and parking lot. All lighting will shut off during periods of non-use (defined as more than 30 minutes before or after scheduled trains).</p>	Contractor	X	X		<p>Authority shall include as contract requirement.</p> <p>Contractor shall design station lighting and fencing according to this mitigation.</p>	<p>Authority review and approval of station lighting and fencing design.</p>	

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
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<p>If fencing is required, wildlife-safe fencing will be used and installed in such a manner so as not to entrap wildlife species at fence lines. Wildlife crossings will be installed along the fence line and designed to facilitate movement by common and special-status species (including San Joaquin kit fox, American badger, California tiger salamander, California red-legged frog, and riparian brush rabbit where suitable habitat is present for these species). Wildlife crossings will be designed in consultation with and approved by USFWS and CDFW.</p>							
<p>BIO-8.4: Improve existing wildlife crossings and/or implement new wildlife crossing options along the Altamont Alignment and the Stone Cut Alignment</p> <p>The Authority will evaluate wildlife movement conditions along the new rail lines in these areas and consult with USFWS and CDFW in the wildlife crossing study and design. If feasible wildlife crossings are identified, the Authority will implement these crossings concurrent with the development of new rail facilities in the Altamont Alignment (and in the development of the Stone Cut Alignment).</p> <p>Wildlife crossings will be designed to facilitate movement by common and special-status species, including mountain lion, San Joaquin kit fox, California tiger salamander, and California red-legged frog, across the Altamont Alignment and the Stone Cut Alignment.</p> <p>The Authority will implement the following wildlife movement improvements between Greenville Station and I-580 west of Tracy as follows, unless the Authority, USFWS, and CDFW mutually agree to alternative measures:</p> <ul style="list-style-type: none"> The Authority will install culverts along drainages and streams and periodically in upland areas along the Altamont Alignment between Greenville Station and I-580 west of Tracy to allow for wildlife passage through grassland and other habitats in the Altamont Hills as determined in consultation with USFWS and CDFW. The Authority will install underpasses or under-road tunnel systems along the Altamont Alignment where the alignment is located adjacent to protected conservation lands between Jess Ranch Road and west of I-580 to allow for wildlife passage between conservation lands. Actual locations of underpasses will be based on consultation with USFWS, CDFW, and UPRR. At the Altamont Alignment I-580 crossing between Flynn Road and North Grant Line Road, the Authority will install directional fencing to assist wildlife wayfinding. The intent of the fencing will be to direct wildlife to the Altamont undercrossing of I-580 eastbound and the UPRR undercrossing of I-580 westbound. Actual locations of fencing will be based on consultation with USFWS, CDFW, Caltrans, and UPRR. The Authority will also fund a study of improvement of existing crossings and/or potential new wildlife crossings under or over I-580 between Greenville Road and North Grant Line Road. The study will include a particular focus on a potential new wildlife overcrossing between the CCWD Habitat Management Units located west of North Grant Line. The study will include the participation of CDFW, USFWS, and the Alameda County Resource Conservation District, and CCWD. The Authority is not obligated to implement any recommended improvements as part of this measure. <p>In lieu of improvements along the specific Altamont Alignment improvements described above, the Authority may place a contribution in escrow for the use in implementing one or more other improvements to existing wildlife crossings of I-580 or a new wildlife crossing of I-580. As described earlier in this section, I-580 has a substantial existing effect on north-south wildlife movement in the Altamont Hills. The Project does not change that existing effect and would not physically block</p>	Authority and its Contractor	X	X		<p>Authority to consult with USFWS, CDFW, and UPRR, and Caltrans.</p> <p>Authority to determine whether to pursue (1) implementation of wildlife movement improvements or (2) place a contribution in escrow for implementation of wildlife crossings.</p> <p>If wildlife movement improvements are the selected method, then the Authority shall include improvements as contract requirement and the Contractor shall develop design of wildlife crossings for Authority review and approval prior to construction.</p> <p>After Authority approval, the plan shall be provided to USFWS and CDFW for review and approval.</p>	<p>Authority review and approval of wildlife crossings designs prior to construction.</p> <p>As may be warranted by final wildlife crossing designs, review and approval of crossing designs by UPRR and/or Caltrans.</p> <p>USFWS and CDFW review and approval prior to construction.</p>	

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
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<p>wildlife movement along the Altamont Alignment but would introduce impediments to wildlife movement in certain areas. The Authority will make such a contribution only if feasible plans to implement such other improvements are being advanced by parties other than the Authority that will be completed within 10 years of the commencement of construction of the Altamont Alignment. The Authority will also make such a contribution only if the Authority, USFWS, and CDFW can mutually agree on a contribution amount by the Authority, based on an estimate of the Project's fair-share of impacts on wildlife movement in the Altamont Hills, taking into account other existing wildlife movement impediments (most prominently I-580, Altamont Pass Road, as well as Patterson Pass Road).</p> <p>Wildlife crossings will be approved by USFWS and CDFW prior to implementation.</p>							
<p>BIO-8.5: Improve existing wildlife crossings and/or implement new wildlife crossing options along certain portions of the Tracy to Lathrop Alignment</p> <p>The Authority will evaluate wildlife movement conditions along the new rail lines in the areas described below and will consult with USFWS and CDFW in the wildlife crossing study and design. If feasible and effective wildlife crossings are identified, the Authority will implement them at the same time as development of new rail facilities in the Tracy to Lathrop area.</p> <ul style="list-style-type: none"> <i>Croplands west of urbanized portions of Tracy near South Lammers Road:</i> The Authority will study the potential for periodic wildlife crossings under the railroad alignment between a point approximately 3,300 feet west of South Lammers Road to South Lammers Road to facilitate movement by common and special-status species, including San Joaquin kit fox, California tiger salamander, and California red-legged frog. If feasible and effective, the Authority will include wildlife crossings in construction contracts. <i>Croplands east of Tracy east of Grant Line Road (east of Banta) to Paradise Cut:</i> The Authority will study the potential for periodic wildlife crossings under the railroad alignment between Grant Line Road to the farm access road west of Paradise Cut to facilitate movement by common and special-status species, including California tiger salamander, California red-legged frog, and riparian brush rabbit, under the Tracy Subdivision. If feasible and effective, the Authority will include wildlife crossings in construction contracts. <i>Paradise Cut:</i> In addition to expanding the Paradise Cut bridge, without any new piles placed in the waterway, the Tracy to Lathrop Alignment will also be elevated on columns west of the Paradise Cut bridge for approximately 300 feet (to the farm access road west of Paradise Cut) and east of the bridge for approximately 700 feet (to the farm access road east of Paradise Cut) to improve wildlife movement opportunity and riparian habitat colonization and restoration along the banks of the riparian corridor. <p>Wildlife crossings will be approved by USFWS and CDFW prior to implementation.</p>	Authority and its Contractor	X	X			<p>Authority to consult with USFWS and CDFW.</p> <p>Authority shall include wildlife crossings as contract requirement.</p> <p>Contractor shall develop design of wildlife crossings for Authority review and approval prior to construction.</p> <p>After Authority approval, the plan shall be provided to USFWS and CDFW for review and approval.</p>	<p>Authority review and approval of wildlife crossings designs prior to construction.</p> <p>USFWS and CDFW review and approval prior to construction.</p>
<p>BIO-10.1: Compensate for tree removal during construction</p> <p>A tree avoidance, minimization, and replacement plan will be developed in consultation with a certified arborist and in consultation with cities, counties, and affected property owners along the project route.</p> <p>The plan will contain the following provisions.</p> <ul style="list-style-type: none"> The definition of what is and is not a tree for the purposes of this mitigation will be the same as the tree definition used in 	Contractor	X	X	X		<p>Authority shall include as contract requirement.</p> <p>Contractor shall conduct a 100% tree survey of the construction footprint prior to construction and submit a tree</p>	<p>Authority review of tree survey report, review, and approval of avoidance memorandum, review, and approval of tree replacement plan.</p>

Mitigation Measure	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
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<p>each municipality (Table 3.4-13).</p> <ul style="list-style-type: none"> • Prior to the construction phase, the Authority will assess the potential to modify the construction methods and access of alignment, stations, and other facilities to avoid or minimize the amount of tree removal or pruning necessary to be consistent with maintenance, operational, and safety requirements. The Authority or its contractor will consult with each jurisdiction along the route to identify where tree removals can and cannot be avoided with near-term and longer-term design measures. • Tree pruning during construction will be done in accordance with arboricultural industry–recommended practices. • If pruning will result in the loss of 25 percent or more of an individual tree’s canopy, then the Authority will consider the tree removed, and it will be replaced in a manner consistent with the following replacement requirements: <ul style="list-style-type: none"> ○ For trees removed outside of the UPRR ROW, the following requirements will apply: <ul style="list-style-type: none"> ○ Where specific replacement ratios or specifications are provided in the local tree ordinance or guidance (e.g., City of Tracy, City of Lathrop, San Joaquin County), the Authority will replace protected trees using the local requirements (as specifically described in Table 3.4 13). ○ Where specific replacement ratios or specifications are not provided in local tree ordinances (City of Pleasanton, City of Dublin, City of Livermore, and Alameda County, as specifically described in Table 3.4 13), the Authority will replace protected trees on a 2:1 basis using 15-gallon trees (i.e., two 15-gallon trees would be planted for each protected tree removed). ○ For unprotected trees in all locations outside the ROW, the Authority will replace trees on a 1:1 basis using 15-gallon trees (i.e., one 15-gallon tree would be planted for each unprotected tree removed). ○ For trees within the UPRR ROW, the following requirements will apply: <ul style="list-style-type: none"> ○ Protected trees will be replaced on a 1:1 basis using 15-gallon trees (i.e., one 15-gallon tree will be planted for every tree removed), where feasible. Unprotected trees will be replaced on the same basis, where feasible, in nonindustrial areas. Unprotected trees in industrial areas will not be replaced. ○ Trees will be replaced with a tree of the same species wherever possible, unless that species is a nonnative, invasive, or an undesirable species (see discussion below). Alternative species to the tree removed may be planted with concurrence from the landowner and local municipality. ○ If onsite tree replacement cannot occur on the UPRR ROW (where trees are removed from the ROW) or on adjacent property (where trees are removed outside of the ROW), then tree replacement may occur on other parts of the affected property (with concurrence from the landowner) or other parts of the local area (with concurrence from the local municipality). Alternatively, the Authority may pay into a local urban forestry fund to support local tree planting programs, provided the Authority and local municipalities can agree on the appropriate fund and amount. The replacement requirements described above will apply in determining the equivalent funding amount. <p>Consistent with Executive Order 13112 on invasive species, when the Authority or its contractor replaces trees, the Authority will use native tree species insofar as it is practicable. Within the UPRR ROW, the Authority will not plant invasive tree species,</p>					<p>survey report to Authority.</p> <p>Contractor shall review construction plans to identify where trees can be avoided and where they cannot and provide a technical memorandum for Authority approval prior to construction.</p> <p>Contractor shall coordinate with local jurisdictions about tree removal.</p> <p>Contractor shall prepare a tree replacement plan, including a plan for maintenance and monitoring (including a minimum 5-year monitoring period) for Authority approval prior to tree removals.</p> <p>Contractor shall report on tree replacement implementation annually until completion.</p>	<p>Authority review of implementation and completion reports.</p>

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as defined by the California Invasive Plant Council. For replacement of trees outside the UPRR ROW, the Authority will replant (or pay for others to replant) trees that are desired by the landowner or local municipality. Landowners may prefer that replacement trees be nonnative trees to match nonnative trees that were removed or to match surrounding vegetation.							
<p>CUL-1.1: Prepare and submit Historic American Engineering Record documentation</p> <p>Before any alteration of historical resources or any nearby Project construction (including, but not limited to, tree removal/vegetation clearing; ground-disturbing activities such as earthmoving, grading, excavation; equipment/vehicle and trailer staging; and installation of temporary or permanent fencing), the Authority shall retain a professional who meets the SOI's Professional Qualifications Standards for Architectural History and/or History to prepare written and photographic documentation of historical resources that would be potentially significantly affected by the Project. The documentation of historical resources should be prepared based on the National Park Service's Historic American Engineering Record (HAER) historical report guidelines. The written historical data should follow the HAER three-part outline format for engineering structures, which includes (1) historical information (physical history, historical context), (2) structural/design information (general statement, description, mechanicals, site information), and (3) sources of information. The written historical data should be printed on 8.5- by 11-inch archival bond paper. Efforts should also be made to locate original construction drawings/plans and photographs of the historical resource during its period of significance. If located, these drawings/plans/photographs should be photographed, reproduced, and included in the dataset. Prior to the start of construction, large-format (4- by 5-inch or larger negative-size) black-and white archival photographs would be taken. Photograph views for the dataset should include (1) contextual views; (2) views of each side of the structure and interior views, where possible/applicable; (3) oblique views; and (4) detail views of character-defining features. The photographs would be processed for archival permanence in accordance with HAER photographic specifications. Each view would be fully captioned and, if necessary, perspective corrected. All views also would be referenced on a photographic key. The photographic key would be on a map of the resource and show the photograph number with an arrow to indicate the direction of the view. The archival recordation would be submitted by the Authority to the California Railroad Museum (Sacramento) and the California State Library (Sacramento) for their permanent collections.</p>	Contractor	X				Authority shall include as contract requirement. Contractor shall develop Historic American Engineering Record documentation for Authority review prior to construction.	Authority review and approval of Historic American Engineering Record documentation prior to construction and prior to delivery to the California Railroad Museum (Sacramento) and the California State Library (Sacramento).
<p>CUL-1.2: Prepare interpretive exhibits</p> <p>Interpretive exhibits would provide information regarding the specific historical resources that would be affected as part of the Project. The interpretive exhibits would utilize images, narrative history, drawings, or other material produced for the mitigation described above, including the HAER documentation, or other archival sources. The interpretive exhibits would be display panels and would be installed at proposed stations/platforms nearest the historical resource that may be adversely affected by the Project. The signage would provide a brief history of the resource, engineering features and characteristics, historic photographs, and the reason for alteration.</p>	Contractor	X	X			Authority shall include as contract requirement. Contractor shall develop interpretive exhibits for installation prior to the end of construction.	Authority review and approval of interpretive exhibits prior to installation.
<p>CUL-2.1: Develop and implement an archaeological testing plan</p> <p>This measure would apply to the Tracy to Lathrop Alignment Variant 1, Single Track and Tracy to Lathrop Alignment Variant 2, Double Track because one previously recorded CEQA resource is located within these alignments. One prehistoric archaeological property (P-39-000141/CA-SJO-3) were identified within the Tracy to Lathrop segment. One historic-era farm dump (P-39-000013) is also located adjacent to the Tracy to Lathrop Alignment Variant 1, Single Track and Tracy to Lathrop Alignment Variant 2, Double Track. Although this is likely a small assortment of isolated farm equipment, it is unknown if</p>	Contractor	X	X			Authority shall include as contract requirement. Contractor shall develop an archaeological testing plan for Authority review prior to construction.	Authority review and approval of archaeological testing plan prior to construction.

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<p>subsurface historic artifacts or features are present at this location. It has not been formally evaluated or determined ineligible. Tracy to Lathrop Alignment Variant 1, Single Track includes construction of a new siding east of the UPRR undercrossing of the I-5 bridge. This proposed siding would be located within the current boundaries of P-39-000141 (CA-SJO-03). Due to the presence of known archaeological resources in the proposed work area, archaeological testing should occur to determine the extent of the specifically identified resources as well as its significance under CEQA.</p> <p>Prior to construction (any ground-disturbing activity) the Authority will retain a qualified archaeologist to prepare an archaeological testing plan (ATP). The ATP should include the following items:</p> <ul style="list-style-type: none"> • Background and Anticipated Resource Types • Research Questions that can be addressed by the collection of data from the defined resource types • Field Methods and Procedures • Cataloging and Laboratory Analysis • Findings and Interpretation <p>The ATP will be implemented to determine the extent of archaeological resources within any area where there will be ground disturbance. The results of the study will be summarized into a technical document that will determine whether further study is necessary. The technical document will also determine whether additional mitigation will be needed, and can lead to additional studies and, if needed, even further mitigation.</p>							
<p>CUL-2.2: Conduct cultural resources awareness training</p> <p>This measure would apply to construction of all Proposed Project. Prior to construction (any ground-disturbing activity) contractor personnel who conduct or are associated with ground disturbance will attend a preconstruction cultural resources awareness tailboard training session provided by the contract archaeologist. The training will address measures to avoid or protect artifacts and archaeological features, cultural resources identification, and the mandatory procedures to follow should potential cultural resources be exposed during construction.</p>	Contractor	X	X		<p>Authority shall include as contract requirement.</p> <p>Contractor shall develop an environmental awareness training plan for Authority review prior to construction.</p>	<p>Authority review and approval of environmental awareness plan prior to construction.</p>	
<p>CUL-2.3: Develop an archaeological monitoring plan</p> <p>This measure would apply to the Tracy to Lathrop Alignment Variant 1, Single Track and Tracy to Lathrop Alignment Variant 2, Double Track.</p> <p>Prior to construction (any ground-disturbing activity), the Authority will retain a qualified archaeologist to prepare an archaeological monitoring plan (AMP). The AMP will identify areas considered archaeologically sensitive and where archaeological monitoring will be required. The AMP will include protocol that outlines archaeological monitoring best practices, anticipated resource types, and an unanticipated discovery protocol. The unanticipated discovery protocol will describe steps to follow if unanticipated archaeological discoveries are made during construction activities and will identify the chain of contact. The lead agency will review and approve the AMP prior to any ground-disturbing activities.</p>	Contractor	X	X		<p>Authority shall include as contract requirement.</p> <p>Contractor shall develop an archaeological monitoring plan for Authority review prior to construction.</p>	<p>Authority review and approval of archaeological monitoring plan prior to construction.</p>	

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<p>CUL-2.4: Implement avoidance and protection measures</p> <p>This measure would apply to the Tracy to Lathrop Alignment Variant 1, Single Track and Tracy to Lathrop Alignment Variant 2, Double Track.</p> <p>Changing the rail alignment to avoid newly discovered sites is likely infeasible; however, access areas and laydown sites may be relocated, where feasible, should their location be found to be on archaeological sites. All avoidance and protection measures for archaeological resources will be delineated on construction drawings.</p>	Contractor	X	X			<p>Authority shall include as contract requirement.</p> <p>Contractor shall incorporate avoidance and protection measures in construction drawings prior to construction.</p>	<p>Authority review and approval of construction drawings prior to construction.</p>
<p>CUL-2.5: Conduct archaeological monitoring</p> <p>This measure would apply to the Tracy to Lathrop Alignment Variant 1, Single Track and Tracy to Lathrop Alignment Variant 2, Double Track.</p> <p>During construction (any ground-disturbing activity) the Authority will be responsible for providing qualified archaeological and tribal monitors to observe any ground-disturbing construction activities with potential to affect archaeological remains in areas that have been identified as archaeologically sensitive. Archaeological sensitivity is based on areas in proximity to known archaeological sites, areas identified by the tribal consulting parties as sensitive, and/or geo-archaeological analysis.</p>	Contractor	X	X			<p>Authority shall include as contract requirement.</p> <p>Contractor shall develop an archaeological monitoring plan for Authority review prior to construction.</p>	<p>Authority review and approval of archaeological monitoring plan prior to construction.</p>
<p>CUL-2.6: Implement procedures in case of unanticipated discoveries</p> <p>This measure would apply to construction of all Proposed Project. If archaeological deposits are encountered during ground disturbance, work in the area is to stop immediately. The Authority will retain a qualified archaeologist who will be contacted to assess the discovery. Archaeological deposits include, but are not limited to, flaked stone or groundstone, midden and shell deposits, historic-era refuse, and/or structure foundations. The unanticipated discovery protocol outlines the processes to follow in the event of an unanticipated discovery.</p> <p>Should the discovery include human remains, all parties will comply with federal and state regulations and guidelines regarding the treatment of human remains, including relevant sections of NAGPRA (§ 3(c)(d)), California Health & Saf. Code Section 8010 et seq., and Cal. Public Res. Code Section 5097.98, and consult with NAHC, tribal groups, and the SHPO.</p>	Contractor	X	X			<p>Authority shall include as contract requirement.</p> <p>Contractor shall develop an inadvertent discovery plan for Authority review prior to construction.</p>	<p>Authority review and approval of inadvertent discovery plan prior to construction.</p> <p>In the event of inadvertent discoveries involving human remains, the Authority and/or its Contractor shall , consult with the appropriate entities.</p>
<p>CUL-3.1: Comply with state laws relating to Native American remains</p> <p>If human remains of Native American origin are discovered during ground-disturbing activities, it will be necessary to comply with state laws regarding the disposition of Native American burials, which fall within the jurisdiction of the NAHC (Pub. Res. Code § 5097). If human remains are discovered or recognized in any location other than a dedicated cemetery, there will be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:</p> <ol style="list-style-type: none"> 1. The county coroner has been informed and has determined that investigation of the cause of death is required; and 2. If the remains are of Native American origin: <ol style="list-style-type: none"> a. The descendants of the deceased Native Americans have made a recommendation to the landowner or the person responsible for the excavation work for means of treating or disposing of, with appropriate dignity, the human 	Contractor	X	X			<p>Authority shall include as contract requirement.</p> <p>Contractor shall develop an inadvertent discovery plan. Including for human remains for Authority review prior to construction.</p>	<p>Authority review and approval of cultural resource monitoring and inadvertent discovery plan, including for human remains prior to construction.</p> <p>In the event of inadvertent discoveries involving human remains, the Authority and/or its</p>

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<p>remains and any associated grave goods as provided in Pub. Res. Code § 5097.98; or</p> <p>b. The NAHC was unable to identify a descendent or the descendent failed to make a recommendation within 24 hours after being notified by the commission.</p> <p>According to California Health & Saf. Code, six or more human burials at one location constitute a cemetery (§ 8100), and disturbance of Native American cemeteries is a felony (§ 7052). Section 7050.5 requires that excavation be stopped in the vicinity of the discovered human remains until the coroner can determine whether the remains are those of a Native American.</p>						Contractor shall , consult with the appropriate entities.	
<p>GEO-4.1: Monitor for discovery of paleontological resources, evaluate found resources, and prepare and follow a recovery plan for found resources</p> <p>The following measure will be undertaken during construction of the following proposed alignments, stations, and OMFs: Tri-Valley Alignment; Isabel Station; Altamont Alignment, including the Owens-Illinois Industrial Lead Variant 1, Single Track and the Owens-Illinois Industrial Lead Variant 2, Double Track; Interim OMF; Tracy OMF; Tracy to Lathrop Alignment Variant 1, Single Track; Tracy to Lathrop Alignment Variant 2, Double Track; River Islands Station; North Lathrop Station; Southfront Road Station; Stone Cut Alignment; and Mountain House Station Alternative.</p> <p>Before the start of ground-disturbing activities, the Authority will retain a qualified paleontologist, as defined by the SVP, who is experienced in identifying potential for occurrence of significant fossils at construction sites, and who is experienced in teaching non-specialists. The qualified paleontologist will conduct appropriate studies of the construction site before any ground-disturbing activities occur, including onsite investigations, to determine likelihood of significant fossils at the site, in particular small fossils. Particular attention will be given to smaller vertebrate fossils in those areas where the Tassajara Formation or San Pablo Group occur (i.e., geologic units known to contain an abundance of rodent or lagomorph fossils), which includes the Tri-Valley Alignment; Isabel Station; Greenville Station; Altamont Alignment, including the Owens-Illinois Industrial Lead Variant 1, Single Track and the Owens-Illinois Industrial Lead Variant 2, Double Track; and the Mountain House Station.</p> <p>If vertebrate fossils are determined likely to be discovered at the construction site, the qualified paleontologist or his/her appointee will conduct onsite monitoring during construction activities.</p> <p>In addition, the qualified paleontologist will train all construction personnel who are involved with earthmoving activities, including the site superintendent, regarding the possibility of encountering fossils, the appearance and types of fossils that are likely to be seen during construction, and proper notification procedures should fossils be encountered. Procedures to be conveyed to workers include halting construction within 50 feet of any potential fossil find and notifying a qualified paleontologist, who will evaluate the significance.</p> <p>The qualified paleontologist will also make periodic visits during earthmoving in high sensitivity sites to verify that workers are following the established procedures.</p> <p>If paleontological resources are discovered during earthmoving activities either by the paleontological monitor or the construction personnel, the construction crew will immediately cease work near the find and notify the Authority. Construction work in the affected areas will remain stopped or be diverted to allow recovery of fossil remains in a timely manner. The Authority will retain a qualified paleontologist to evaluate the resource and prepare a recovery plan in</p>	Contractor	X	X		<p>Authority shall include as contract requirement.</p> <p>Contractor shall develop a paleontological resource monitoring and recovery plan for Authority review prior to construction.</p>	<p>Authority review and approval of paleontological resource monitoring and recovery plan prior to construction.</p>	

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<p>accordance with SVP guidelines (SVP 2010). The recovery plan may include a field survey, construction monitoring, sampling and data recovery procedures, museum storage coordination for any specimen recovered, and a report of findings. Recommendations in the recovery plan that are determined by the Authority to be necessary and feasible will be implemented before construction activities can resume at the site where the paleontological resources were discovered. The Authority will be responsible for ensuring that the monitor’s recommendations regarding treatment and reporting are implemented.</p>							
<p>HAZ-2.1: Conduct site investigations</p> <p>Prior to construction, the Authority will hire a certified environmental professional to prepare work plans and conduct Phase I and, if necessary, Phase II, Environmental Site Assessments (ESAs) for all Proposed Project improvements within each segment to evaluate the chemical quality of soil, ballast, and/or groundwater that could be disturbed during construction and maintenance activities. The work plans will describe how representative samples of soil, ballast, and groundwater will be collected and analyzed for potential contamination within each segment from the following potential sources of hazardous materials.</p> <ul style="list-style-type: none"> • Railroad corridors • Roadways with yellow pavement markings • Hazardous materials release sites • Petroleum pipelines • Agricultural land <p>Work plans will be submitted to the appropriate oversight agency for review and approval.</p> <p>In accordance with the approved work plans, the Phase I (and Phase II, if necessary) ESAs will be conducted and evaluated by a licensed professional for the Proposed Project improvements. The Phase I (and Phase II, if necessary) ESAs will summarize the field activities and analytical results and will be submitted to the appropriate oversight agency for review and approval.</p>	Contractor	X				<p>Authority shall include as contract requirement.</p> <p>Contractor shall conduct a site investigation for hazardous materials and prepare a site investigation report for Authority and agency review and approval prior to construction.</p> <p>Authority review and approval of site investigation plan prior to submission to RWQCB or DTSC.</p> <p>Authority review and site investigation report prior to submission to RWQCB or DTSC.</p>	
<p>HAZ-2.2: Implement construction risk management plan</p> <p>Prior to construction, the Authority will prepare a construction risk management plan (CRMP) for the Proposed Project improvements that provides a framework for proper characterization and management of contaminated soil, ballast, and groundwater that could be disturbed during construction and maintenance activities. The CRMP will describe how to meet the following key objectives.</p> <ul style="list-style-type: none"> • Identify various scenarios under which large volumes of soil and railroad ballast generated during construction and maintenance can be safely reused. • Identify maximum acceptable contaminant levels to protect workers, passengers, the public, and ecological receptors for each soil and ballast reuse scenario. • Identify maximum acceptable contaminant levels to protect station workers and passengers potentially exposed to vapor intrusion, if any, from soil or groundwater contamination. 	Contractor	X	X			<p>Authority shall include as contract requirement.</p> <p>Contractor shall prepare a CRMP for construction and obtain RWQCB or DTSC agreement after Authority review prior to construction.</p> <p>Authority shall modify the construction CRMP to develop maintenance controls to minimize risk and incorporate CRMP requirements in</p> <p>Authority review and approval of CRMP prior to submission to RWQCB or DTSC.</p> <p>Authority inclusion in maintenance contracts.</p>	

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<ul style="list-style-type: none"> Identify sampling and analysis, stockpiling, transportation, health and safety, and other procedures by which soil and ballast must be managed in order to meet safety, regulatory and other standards. Define how the groundwater that could be encountered during construction and maintenance will be characterized, properly managed, and discharged or treated. <p>Based on the analytical results of the site investigations required under Mitigation Measure HAZ-2.1 Conduct site investigations, maximum acceptable contaminant levels will be established for the following soil and ballast reuse scenarios.</p> <ul style="list-style-type: none"> “Unrestricted Onsite Reuse” in which soil and ballast excavated from the Proposed Project footprints can be reused in any onsite area. “Stations Reuse” in which soil and ballast excavated from the Proposed Project footprints can be reused in station areas where there would be relatively frequent potential exposure. “Right-of-Way Reuse” in which soil and ballast excavated from the Proposed Project footprint can be reused in areas where there would be relatively infrequent potential exposure along the right-of-way of railroad tracks. “Encapsulation” in which soil and ballast excavated from the Proposed Project footprint can be reused under barriers or other structures (and covered on all exposed sides by clean material or asphalt paving). <p>To protect ecological receptors, the reuse scenarios will incorporate additional limitations (as necessary) near creeks, surface waters, or other aquatic habitats based on the findings of an ecological risk assessment. Soil or ballast that contains chemical constituents at levels greater than the acceptable reuse scenarios will be disposed of in accordance with RCRA and Cal. Code Regs. at a facility permitted to accept the waste. Imported fill materials will be characterized to demonstrate they satisfy the criteria for “Unrestricted Onsite Reuse” established in the CRMP.</p> <p>All extracted groundwater will be considered potentially contaminated and will require characterization to determine the appropriate treatment requirements (if necessary) for discharge. The extracted groundwater will be collected and managed prior to discharge in compliance with local and state regulations and permit requirements, including the SWRCB and Regional Water Resources Control Boards.</p> <p>Health and safety procedures described in the CRMP will include requirements for an air quality monitoring program during excavation in areas with elevated contaminants of concern to ensure that fugitive dust emissions do not pose an unacceptable health risk to workers or the public. The air monitoring program will identify action levels for total particulates that require respiratory protection, implementation of engineering controls, and ultimately work stoppage. This monitoring program will be in addition to the fugitive dust controls required under Mitigation Measure AQ-2.5 Implement fugitive dust controls during construction.</p> <p>A licensed professional will prepare the CRMP and submit it to the appropriate oversight agency for review and approval prior to construction. The approved CRMP will be implemented during construction and maintenance of the Proposed Project improvements within each segment.</p>						<p>maintenance contracts.</p>	

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<p>HYD-3a.1: Prevent construction materials from being exposed to storm flooding hazards.</p> <p>Construction materials (particularly soil stockpiles and hazardous materials such as fuels, lubricants, and oils) will not be stored in areas of potential storm flooding inundation (i.e., 100-year or 200-year flood zones and within drainage courses) during the winter rainy season (i.e., November 1 through April 31).</p>	Contractor	X	X			<p>Authority shall include as contract requirement.</p> <p>Contractor shall include storm event monitoring and contingency plans in construction plans for Authority review prior to construction.</p>	Authority review and approval of construction plan prior to construction.
<p>HYD-3b.1: Perform detailed hydraulic evaluations and implement new or modify existing stormwater controls as required to prevent storm drainage system capacity exceedance and reduce pollutant transport.</p> <p>Detailed hydraulic evaluations will be performed and completed during the Project design phase for improvements that include alteration of drainage patterns such as alteration and construction of trackside ditches, construction of new impervious pavement and stormwater drainage systems at stations and parking lots, and construction of new connections to existing stormwater drainage systems, to ensure that the new stormwater control infrastructure is appropriately designed and that runoff from near-term improvements would not exceed the capacity of storm drainage systems or result in substantial additional pollutant transport. The detailed hydraulic evaluations will be performed in accordance with the requirements of the latest edition of the Caltrans <i>Highway Design Manual</i> for track areas and station platforms, and in accordance with regulations and design requirements of local municipalities for other improvements associated with stations. A professional engineer will perform and certify the following detailed hydraulic evaluations.</p> <ul style="list-style-type: none"> • Improvements comply with regulations and design requirements of local municipalities for discharges to storm drainage systems within those jurisdictions. • Improvements are designed to accommodate storm frequencies, precipitation data, and runoff calculations. • The capacity of existing or proposed storm drainage systems that would receive discharges is adequate. <p>If improvements could result in exceedance of existing or proposed storm drainage systems and subsequent downstream pollutant transport, modification of onsite stormwater control designs or offsite storm drainage systems will be performed to reduce and control runoff and potential for flooding. These modifications may include the following measures.</p> <ul style="list-style-type: none"> • Reducing impervious surfaces through use of permeable pavement surfaces for station improvements. • Increasing the size of drainage ditches, swales, retention basins, infiltration basins, trenches, and cross-drainage facilities within track and station areas. • Increasing the capacity of downstream stormwater drainage systems by increasing the size of offsite storm drains, drainage canals, and retention and infiltration basins. <p>In general, the drainage design for Proposed Project improvements would involve the following features.</p> <ul style="list-style-type: none"> • Construct trackside swales or ditches to collect runoff from the track areas. 	Contractor	X	X			<p>Authority shall include as contract requirement.</p> <p>Contractor shall conduct hydraulic evaluations for all improvements within drainage courses and flood zones to determine flood impacts and shall modify designs to reduce flooding impacts to existing conditions. The Hydraulic Study shall be submitted along with modified designs to Authority prior to submission to any necessary regulatory agencies.</p>	<p>Authority review and approval of hydraulic study and modified designs prior to submission to regulatory agencies.</p> <p>Regulatory agency review and approval prior to construction.</p>

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<ul style="list-style-type: none"> • Allow infiltration and detention onsite and offsite, if feasible. • Evaluate or improve the capacity of the existing drainage system to carry runoff from near-term improvements, if required. • Construct cross-culverts under the existing or new tracks to carry runoff across the trackway system to maintain the flow pattern. • Construct catch basins as required to convey excess flows from the near-term improvements to the local drainage system, and install and operate appropriate BMPs to reduce and/or treat (as required by the appropriate jurisdiction) pollutants washed from new, Project-related impervious surfaces. 							
<p>HYD-4.1: Perform hydrologic and hydraulic studies for project improvements to be located in floodplains, coordinate with regulatory agencies, and obtain required permits.</p> <p>During the detailed Proposed Project design phase, the Authority will prepare site-specific detailed hydrologic and hydraulic studies for improvements that are proposed within the 100- and 200-year floodplains. The results of these studies will be used to inform the design of Proposed Project-related facilities, such that they are specifically designed to pass 100- and 200-year flows without impedance as required by FEMA, DWR, USACE, and CVFPB standards so that upstream, onsite, and downstream flooding would not occur. Furthermore, during the detailed Proposed Project design phase, the Authority will consult with DWR and CVFPB regarding Proposed Project-related work that is proposed in the Paradise Cut area, to ensure that Proposed Project facilities are designed so they will not impair any of the flood improvements that are planned by DWR and CVFPB as part of the CVFPP and the San Joaquin Basin-Wide Feasibility Study. Finally, prior to the start of any earthmoving activities, the Authority will obtain all necessary permits and will provide copies of engineering plans and consult with any necessary agencies with levee jurisdiction, such as DWR, CVFPB, USACE, or local reclamation districts, for all Proposed Project-related work that would be required in or through existing levees. Proposed Project-related work in or through existing levees will be performed in accordance with the terms of the permits, which would contain site-specific measures to protect public safety and water quality, as issued by the applicable regulatory agency.</p>	Contractor	X	X		<p>Authority shall include as contract requirement.</p> <p>Contractor shall conduct hydraulic evaluations for all improvements within drainage courses and flood zones to determine flood impacts and shall modify designs to reduce flooding impacts to existing conditions. The Hydraulic Study shall be submitted along with modified designs to Authority prior to submission to any necessary regulatory agencies.</p>	<p>Authority review and approval of hydraulic study and modified designs prior to submission to regulatory agencies.</p> <p>Regulatory agency review and approval prior to construction.</p>	
<p>NOI-1.1a: Implement a construction noise control plan</p> <p>A noise control plan that incorporates, at a minimum, the following best management practices into the construction scope of work and specifications to reduce the impact of temporary construction-related noise on nearby noise-sensitive receptors (if present in the construction area) will be prepared and implemented.</p> <ul style="list-style-type: none"> • Install temporary construction site sound barriers near noise sources. • Use moveable sound barriers at the source of the construction activity. • Avoid the use of impact pile drivers where possible near noise-sensitive areas or use quieter alternatives (e.g., drilled piles) where geological conditions permit. • Locate stationary construction equipment as far as possible from noise-sensitive sites. • Re-route construction-related truck traffic along roadways that will cause the least disturbance to residents. • Use low-noise emission equipment. 	Contractor	X	X		<p>Authority shall include as contract requirement.</p> <p>Contractor shall prepare a construction noise control plan for Authority review prior to construction.</p>	<p>Authority review and approval of construction noise control plan prior to construction.</p>	

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
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<ul style="list-style-type: none"> Implement noise-deadening measures for truck loading and operations. Line or cover storage bins, conveyors, and chutes with sound-deadening material. Use acoustic enclosures, shields, or shrouds for equipment and facilities. Use high-grade engine exhaust silencers and engine-casing sound insulation. Minimize the use of generators to power equipment. Limit use of public address systems. Grade surface irregularities on construction sites. Monitor and maintain equipment to meet noise limits. Establish an active community liaison program to keep residents informed about construction and to provide a procedure for addressing complaints. 							
<p>NOI-1.1b: Implement a phased program to reduce train noise along the Valley Link corridor as necessary to address noise increases over FTA’s severe impact thresholds.</p> <p>This mitigation applies mandatorily to noise increases over FTA’s severe impact thresholds. Mitigation is recommended for moderate impacts particularly when already addressing severe impacts in an area, but is not mandatory for the purposes of CEQA.</p> <p>The Authority will require new rolling stock for Valley Link operation to meet FRA vehicle noise requirements and will require train horn height and noise level to be as low as possible while complying with the FRA Train Horn Rule per FRA regulations (49 C.F.R. Part 222). The Authority will also establish safety warning requirements for trains transiting through stations that minimize train horn noise, as and where feasible, while also providing adequate safety awareness for station users.</p> <p>The Authority will also coordinate with other rail operators, local jurisdictions (including the cities of Tracy and Lathrop), transportation funding agencies, and state and federal agencies to implement incremental the noise-reduction measures described below at the locations of severe cumulative noise impacts (as funding becomes available), where such measures are acceptable to the local community, and where measures are determined feasible. This mitigation applies to the locations where the Proposed Project would substantially contribute to severe cumulative noise impacts. Where the Proposed Project would not contribute to severe cumulative noise impacts, the Authority is not required to participate in mitigation.</p> <p>The Authority will work with local, state, and federal partners to establish priorities for noise reduction measures to be implemented as funding becomes available. The Authority will also work with other willing rail operators to seek additional funding from other parties that contribute to cumulative noise levels.</p> <p>Improvements will be phased as needed to address changes in rail service over time and the associated rail noise over FTA’s severe impact thresholds. If funding participation by other parties is limited, the Authority may not be able to fund all potential noise mitigation on its own, particularly where the mitigation to address cumulative noise impacts far exceeds the Authority’s fair share of the impact.</p>	Authority and its contractor	X	X	X	X	<p>Authority shall include as contract requirement.</p> <p>Authority shall determine the preferred approach for reducing noise impacts.</p> <p>If a quiet zone is selected, Authority will coordinate with applicable municipalities to determine if a quiet zone is feasible. If a quiet zone is feasible, then Authority will direct the contractor to determine the necessary improvements for the quiet zone, design the improvements, and construct them.</p> <p>If the quiet zone is not feasible or is not selected, Authority will direct the contractor to conduct a noise study to determine the feasibility and cost effectiveness of wayside horns, building insulation, or noise</p>	Authority review and approval of design of selected mitigation approach.

Mitigation Measure	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
	Implementing, Reporting and Monitoring Responsibilities	Pre-Construction	Construction	Post-Construction		
<p><i>Train Horn Location</i></p> <p>The Authority will require train horns on new train equipment used for Valley Link service to be placed at the minimum height above the top of rail (ATOR) and to use the minimum noise level that is compliant with the FRA Train Horn Rule. Placement of train horns at lower heights on trains can reduce the spillover of noise in adjacent areas while meeting FRA noise warning requirements for vehicular, pedestrian and other users of at-grade crossings. For example, future trains procured for the California High-Speed Rail system would feature horns mounted at 7 feet ATOR with an Lmax of 96 dBA at 100 feet from the track. Future electric multiple unit trains procured by Caltrain as part of its electrification project would feature horns mounted at 3 feet ATOR.</p>					<p>barriers. Authority will select the preferred method and direct the contractor to design and implement them.</p> <p>The selected option shall be implemented prior to operations.</p>	
<p><i>Station Warning Requirements Concerning Train Horn Sounding</i></p> <p>The FRA Train Horn Rule applies to public at-grade crossings of rail rights of way; it does not apply to trains transiting through stations. Operational safety warning requirements concerning warnings at stations are determined by the host railroad.</p> <p>For stations within the Authority’s dedicated right-of-way (e.g. west of the Owens-Illinois Industrial Lead) where significant impacts to sensitive noise receptors are identified due to sounding of train horn noise, the Authority will evaluate whether safety warning procedures can provide adequate safety without full sounding of train horns. Safety warning procedures could include: reduced duration of horn sounding, use of a secondary train horn with a lower noise level than the FRA Train Horn Rule compliant horn (such as a horn with similar sound level as used by BART for their station entry), and/or wayside horns, bells, verbal announcements, visual warnings, or other means. Auditory warnings will be required (e.g. visual warnings alone will not be considered sufficient to provide adequate safety). The Authority will determine what kind of warnings will provide adequate safety for these stations as necessary to address significant noise effects.</p> <p>For stations within UPRR right-of-way, the Authority will consult with UPRR to determine what auditory and visual warning will be required when transiting through stations. UPRR is the host railroad for its right-of-way and thus may mandate the sounding of FRA Horn Rule compliant horns when entering or transiting through stations and not allow the use of other safety warning methods.</p> <p>Where revised warning methods at stations are inadequate to avoid significant noise impacts to sensitive receptors due to horn noise, the Authority will consider targeted noise barriers between the areas of horn sounding and sensitive receptor locations (see discussion of noise barriers below).</p>						
<p><i>Wayside Horns and Residential Building Sound Insulation</i></p> <p>The Authority, in cooperation with the other parties noted above, will evaluate the potential to reduce noise impacts through the installation of wayside horns and building sound insulation improvements at residences projected to have a sound increase greater than the FTA severe impact criteria. Building sound insulation methods may include extra wall insulation, window glazing, and sealing of exterior surfaces.</p> <p>During final design, a technical study will be completed to evaluate the effectiveness of reducing impacts to less than the FTA severe impact threshold through these methods. If the study determines it is feasible to reduce the impact to less than the threshold at an affected sensitive noise receptor, then no additional mitigation at that location will be required. Building sound insulation measures will only be installed to the extent necessary to meet the impact threshold at the receptor location and will</p>						

Mitigation Measure	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
	Implementing, Reporting and Monitoring Responsibilities	Pre-Construction	Construction	Post-Construction		
<p>only be installed if building owners are willing to accept such measures.</p> <p><i>Quiet Zones</i></p> <p>The lead agency for a quiet zone designation is the local jurisdiction (typically the city or county) responsible for traffic control and law enforcement on the roads at the at-grade crossings.</p> <p>The Authority, in cooperation with the other parties, noted above, and the affected local jurisdictions (i.e., the cities of Tracy and Lathrop) will implement a phased program considering the potential establishment of quiet zones along the Valley Link corridor at all locations where train noise is predicted to exceed FTA severe impact thresholds. The Authority will work closely with local jurisdictions including the cities of Tracy and Lathrop to prepare the engineering studies and coordination agreements to design, construct, and enforce potential quiet zones.</p> <p>Options for establishing quiet zones could include implementation of the following FRA pre-approved supplemental safety measures (SSMs).</p> <ul style="list-style-type: none"> • Four-quadrant gate system. This measure involves the installation of at least one gate for each direction of traffic to fully block vehicles from entering the crossing. • Gates with medians or channelization devices. This measure keeps traffic in the proper travel lanes as it approaches the crossing, thus denying the driver the option of circumventing the gates by traveling in the opposite lane. • One-way street with gates. This measure consists of one-way streets with gates installed so that all approaching travel lanes are completely blocked. This option may not be feasible or acceptable to local jurisdictions at all locations where the establishment of quiet zones would reduce noise impacts. • Road closure. This measure consists of closing the road to through travel at the at-grade crossing. This option may not be feasible or acceptable to local jurisdictions at all locations where the establishment of quiet zones would reduce noise impacts. <p>In addition to these pre-approved SSMs, FRA also identifies a range of other measures that may be used to establish a quiet zone. These measures could be modified SSMs or non-engineering measures that might involve law enforcement or public awareness programs. Such safety measures must be approved by FRA based on the prerequisite that they provide an equivalent level of safety as the sounding of train horns.</p> <p>Wayside horns can also be used as part of a quiet zone. While not avoiding the sounding of a horn, wayside horns affect a smaller area than train-mounted horn. Wayside horns can be used when the other measures above are not adequate to avoid the use of a horn.</p> <p>The lead agency for a quiet zone designation is the local public authority, which is the only authority that can implement a quiet zone. The Authority or the other rail operators cannot, on their own, designate the quiet zone. However, only with the implementation of the quiet zone can the Authority, other tenant railroads, and freight operators be relieved of the requirement to sound their horns when crossing at-grade crossings. Thus, if a local city does not agree to implement the quiet zone, then even if the required SSMs are present, the Authority, freight, and other rail operators would continue to use train horns as a safety device in compliance with FRA requirements.</p>						

Mitigation Measure	Mitigation Timing				Implementing, Reporting and Monitoring Responsibilities	Implementation and Reporting Schedule	Implementation Mechanism or Tool
	Pre-Construction	Construction	Post-Construction	Operation			
<p><i>Noise Barriers</i></p> <p>For noise barriers to be effective, they must be constructed to intercept the line of sight between a noise source and receptors. Noise barriers can be constructed from a range of potential materials, such as concrete, brick or masonry blocks, metals, wood, rubber, or transparent panels. The height of each noise barrier would depend on engineering design on the conditions at each specific location; typical noise barriers are 8 to 10 feet in height.</p> <p>The Authority will follow the California High Speed Rail Noise and Vibration Guidelines (CHSRA 2018) as it relates to noise barriers. The Authority will take steps to reduce noise substantially through the use of noise barriers that are reasonable, physically feasible, practical, cost-effective, and locally accepted. The following criteria will be used for evaluating the reasonableness of noise barriers as mitigation for severe noise impacts.</p> <ul style="list-style-type: none"> • Calculations and computations for barrier geometry. • Increase over existing noise levels. • Number of noise sensitive sites affected. • The minimum number of affected sites should be at least 10, and the length of a noise barrier should be at least 800 feet. • A minimum outdoor noise reduction of 5 decibels (dB) using the applicable criterion for the property is considered substantial. • Barrier heights up to a maximum of 14 feet will be considered. Mitigation options for areas that require barriers over 14 feet will be studied on a case-by-case basis. • The “reasonable allowance” for the noise barriers is calculated using the Caltrans base cost allowance for the current year, which is published at http://www.dot.ca.gov/hq/env/noise/. • The affected sensitive receptors should approve of implementation of the recommended noise barriers (75 percent of all affected parties). • Noise mitigation measure must be designed, constructed, installed, or implemented in compliance with structural requirements related to ground conditions, wind loading, seismic risk, safety considerations, accessibility, material maintainability and longevity, and applicable engineering design practices and technology. • Noise mitigation measures must not result in an adverse environmental impact, such as significant visual intrusions, blocked views, or adverse effects to a historical site. • Noise mitigation measures must be designed, constructed, installed, and implemented in a manner that does not result in adverse impacts to the visual resources in the area. Sound barriers will consist of a solid barrier no more than 6 feet in height. Above 6 feet, the sound barrier will be made of transparent materials. For example, a 13-foot-high sound barrier 							

Mitigation Measure	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
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<p>would consist of 6 feet of solid material on the bottom topped by 7 feet of transparent material.</p> <ul style="list-style-type: none"> Two factors are required to determine cost effectiveness of mitigation by noise barriers: the unit construction cost and the number of benefited receptors.¹ The cost for constructing a noise barrier along the at-grade portion of the alignment is estimated to be \$70.00 per square foot, and the cost to construct a noise barrier along the elevated portion of the alignment is \$65.00 per square foot. The total cost of mitigation cannot exceed \$95,000 per benefitted receiver. This cost is determined by dividing the total cost of the mitigation measure by the number of noise-sensitive buildings that receive a substantial (i.e., 5 dBA or greater) outdoor noise reduction. This calculation will generally limit the use of mitigation in rural areas that have few and/or isolated residential buildings. If the density of residential dwellings is insufficient to make the measure cost-effective, then other noise abatement measures, such as sound insulation, will be considered on a case-by-case basis. If sound insulation is identified as a mitigation measure, the treatment must provide a substantial increase in noise reduction (i.e., 5 dBA or greater) between the outside and inside noise levels for interior habitable rooms. <p><i>Potential Noise Barriers</i></p> <p>The following is a discussion of potential noise barriers and quiet zones to reduce noise impacts within the Altamont segment and the Tracy to Lathrop segment at locations where project noise levels would exceed FTA’s severe impact thresholds. The potential use of noise barriers to address noise levels that exceed FTA’s moderate impact threshold is also discussed, but is not mandatory. Noise barriers would need to be meet the effectiveness and acceptability criteria noted above. In addition, these recommendations are subject to funding limitations, and the actual improvements will be determined in consultation with local cities and in consideration of public input received.</p> <p>For residential uses adjacent to the alignment, creation of quiet zones at the at-grade crossings and at the station areas, in combination with noise barriers in impacted areas, could mitigate moderate and severe noise impacts as described below.</p> <ul style="list-style-type: none"> Altamont Segment—There would be at-grade crossings and stations in Altamont segment. Trains approaching the at-grade crossings and the station platforms would use horns. The use of revised safety warning measures for stations (as described above) may lower the level of impacts and may avoid or reduce the need for potential noise barriers. Establishing quiet zones at the grade crossing, in combination with noise barriers in impacted areas, if meeting all of the effectiveness and acceptability criteria noted above, could mitigate all moderate and severe noise impacts in the Altamont segment. <ul style="list-style-type: none"> Establishing quiet zones at the grade crossings between Midway Road and Hansen Road in combination with noise barriers would mitigate the severe noise impacts at the receptors represented by site LT-07 because of train horns approaching the at-grade crossings and the station platforms in the Altamont segment. Tracy to Lathrop Segment—There would be at-grade crossings from South Lammers Road to Grant Line Road, also at Canal Road, Stewart Road, D’Arcy Parkway, and East Louise Avenue. The use of revised safety warning measures for stations (as described above) may lower the level of impacts and may avoid or reduce the need for potential noise barriers. Establishing quiet zones at the at-grade crossings in combination with noise barriers in impacted areas, if meeting all of the effectiveness 						

¹ The unit construction cost for noise barriers is based on an evaluation of the design requirements regarding noise barrier mitigation. The typical base cost for transportation noise abatement screen-wall type barriers is available from the Federal Highway Administration’s national inventory of noise barriers, Caltrans, qualified barrier manufacturers, and construction cost historical databases. These sources in (2016/2017 dollars) were used to estimate probable costs per square foot for typical high-speed rail noise barriers that incorporate opaque and transparent materials. The estimate of probable costs for barriers having special requirements (e.g., special foundations, highly curved sections, higher than standard height, etc.) should be evaluated on an individual basis.

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
<p>and acceptability criteria noted above, could mitigate all moderate and severe noise impacts in the Tracy to Lathrop segment as follows.</p> <ul style="list-style-type: none"> o Establishing quiet zones at the at-grade crossings at South Lammers Road and Corral Hollow Road in combination with noise barriers along the properties to the north and south of the railway between South Lammers Road and Corral Hollow Road would mitigate the severe noise impacts at the receptors represented by sites LT-09, LT-21 and LT-20 because of train horns approaching the at-grade crossings in the Tracy to Lathrop segment. o Establishing quiet zones at the at-grade crossings at Corral Hollow Road and West Schulte Road in combination with noise barriers along the properties to the north and south of the railway between Corral Hollow Road and West Schulte Road would mitigate the severe noise impacts at the receptors represented by site LT-19 because of train horns approaching the at-grade crossings in the Tracy to Lathrop segment. o Establishing quiet zones at the at-grade crossings at West Schulte Road and South Tracy Boulevard in combination with noise barriers along the properties to the north and south of the railway between West Schulte Road and South Tracy Boulevard would mitigate the severe noise impacts at the receptors represented by site LT-18 because of train horns approaching the at-grade crossings in the Tracy to Lathrop segment. o Establishing quiet zones at the at-grade crossings at South Tracy Boulevard, North Central Avenue, and North McArthur Drive in combination with noise barriers along the properties to the north and south of the railroad from South Tracy Boulevard to North Central Avenue, and to North McArthur Drive would mitigate the severe noise impacts at the receptors represented by sites LT-17 and LT-16 because of train horns approaching the at-grade crossings and the Downtown Tracy Station platform in the Tracy to Lathrop segment. o Establishing quiet zones at the at-grade crossings at Banta Road and West Grant Line Road in combination with noise barriers along the properties to the north and south of the railway between Banta Road and West Grant Line Road would mitigate the severe noise impacts at the receptors represented by site LT-15 because of train horns approaching the at-grade crossings in the Tracy to Lathrop segment. o Establishing quiet zones at the grade crossings at East Louise Avenue in combination with noise barriers along the properties to the west of the railway from East Louise Avenue to the end of the Proposed Project limits north of the North Lathrop Station would mitigate the severe noise impacts at the receptors represented by site LT-12 because of train horns approaching the at-grade crossings and the North Lathrop Station platform in the Tracy to Lathrop segment. 							
<p>NOI-2.1a: Implement construction vibration control plan</p> <p>A vibration control plan that incorporates, at a minimum, the following best management practices into the construction scope of work and specifications to reduce the impact of temporary construction-related vibration on nearby noise-sensitive receptors will be prepared and implemented.</p> <ul style="list-style-type: none"> • Avoid the use of impact pile drivers where possible near vibration-sensitive areas or use alternative construction methods (e.g., drilled piles) where geological conditions permit. • Avoid vibratory compacting/rolling in close proximity to structures. • Designate a Preservation Director and post contact information in a conspicuous location near the Proposed Project site, so 	Contractor	X	X		<p>Authority shall include as contract requirement.</p> <p>Contractor shall prepare a construction vibration control plan for Authority review prior to construction.</p>	<p>Authority review and approval of construction vibration control plan prior to construction.</p>	

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
<p>that it is clearly visible to nearby receptors most likely to be disturbed. The coordinator will manage complaints and concerns resulting from vibration inducing activities. The severity of the vibration concern would be assessed by the director, and, if necessary, evaluated by a qualified vibration control engineer.</p> <ul style="list-style-type: none"> • Before construction activity begins within 45 feet of one or more residences or businesses, written notification will be provided to the potentially affected residents or business owners, identifying the type, duration, and frequency of construction activities. Notification materials will also identify a mechanism for residents or business owners to register complaints with the appropriate jurisdiction if construction vibration levels are overly intrusive. • Before construction activity begins within 45 feet of one or more residences or businesses, the pre-existing condition of all buildings within a 45-foot radius within the immediate vicinity of proposed construction activities will be recorded in the form of a preconstruction survey. The preconstruction survey will determine conditions that exist before construction begins for use in evaluating damage caused by construction activities. Fixtures and finishes within a 45-foot radius of construction activities susceptible to damage will be documented (photographically and in writing) prior to construction. All damage will be repaired back to its pre-existing condition following the completion of construction activities and post-construction surveys of affected residences or businesses. • The primary contractor will prepare and implement a detailed vibration control plan based on the proposed construction methods. This plan shall identify specific measures to ensure compliance with the vibration control measures specified above. The vibration control plan will be submitted to and approved by the Proposed Project proponent(s) before any vibration-generating construction activity begins. 							
<p>REC-1.1: Coordinate with East Bay Regional Park District to provide advance notice of construction and maintain safe access to Iron Horse Regional Trail during construction activities</p> <p>The Authority or the contractor will coordinate construction activities near the Dublin/Pleasanton BART Station associated with track alignments within the I-580 crossing over Iron Horse Regional Trail with EBRPD so EBRPD can inform users of the trail regarding any potential disruption to use. A safe detour will be implemented during construction of the track alignments over the trail to ensure that use of the trail will remain available and pedestrian, bicyclist, and equestrian access to the trail will be maintained. If a temporary closure is required, the Authority or the contractor will coordinate with EBRPD on the timing and provide at least a 30-day advance notice.</p>	Contractor	X	X		<p>Authority shall include as contract requirement.</p> <p>Contractor shall prepare a recreational safety plan as part of its construction plans for Authority review and approval prior to construction.</p>	<p>Authority review and approval of recreational safety plan prior to submission to East Bay Regional Park District for review.</p>	
<p>REC-1.2: Coordinate with San Joaquin County to provide advance notice of construction and maintain a safe open channel in the San Joaquin River during construction activities</p> <p>The Authority or the contractor will coordinate construction activities associated with the railroad bridge across the San Joaquin River with San Joaquin County so the County can inform users of the river regarding any potential disruption to use. An open channel for water-oriented recreational traffic will be maintained under the bridge at all times. Construction equipment and other potential impediments to recreation will be equipped with required safety markings (e.g., upstream/downstream signage, exclusion methods, lights, etc.). If a temporary closure is required, the Authority or the contractor will coordinate with the County on timing and provide at least a 30-day advance notice.</p>	Contractor	X	X		<p>Authority shall include as contract requirement.</p> <p>Contractor shall prepare a San Joaquin River recreational safety plan as part of its construction plans for Authority review and approval prior to construction.</p>	<p>Authority review and approval of recreational safety plan prior to submission to San Joaquin County for review.</p>	

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
<p>TRA-1.1: Transportation management plan for project construction.</p> <p>The Authority will coordinate with Caltrans and with public works and transportation departments of local jurisdictions to develop a TMP that will mitigate construction impacts on transit, roadway, bicycle, and pedestrian facilities, while allowing for expeditious completion of construction. Measures that will be implemented throughout the course of construction of the Proposed Project will include, but will not be limited to, the following:</p> <ul style="list-style-type: none"> • Limit number of simultaneous street, ramp, and lane closures and consequent detours of transit and automobile traffic within each immediate vicinity, with closure timeframe limited as much as feasible for each closure, unless alternative routes are available. • Implement traffic control measures to minimize traffic conflicts for all roadway users (regardless of mode) where lane closures and restricted travel speeds will be required for longer periods. • Provide advance notice of all construction-related street, ramp, and lane closures, durations, and detours to local jurisdictions, emergency service providers, and motorists. • Coordinate with Caltrans and with public works and transportation departments of local jurisdictions to maintain access for and operations at adjacent properties. • Provide safety measures for motorists, transit vehicles, bicyclists, and pedestrians to ensure safe travel through construction zones. • Limit sidewalk (and pedestrian walkway/path) and bikeway closures to one location within each vicinity at a time, with closure timeframe limited as much as feasible for each closure, unless alternative routes are available. • Provide designated areas for construction worker parking wherever feasible to minimize use of parking in residential or business areas. 	Contractor	X	X			<p>Authority shall include as contract requirement.</p> <p>Contractor shall prepare a construction traffic control plan for Authority review and approval prior to construction. After Authority approval, the plan shall be provided to local jurisdictions and Caltrans for their review and approval, as appropriate.</p>	<p>Authority review and approval of traffic control plan prior to construction.</p> <p>Local jurisdiction and Caltrans approval of traffic control plan, as required.</p>
<p>TRA-1.2: Mainline railway disruption control plan for project construction.</p> <p>The Authority will make efforts to contain and minimize disruption to freight and tenant passenger (ACE) services during project construction, while allowing for expeditious completion of construction. Measures that will be implemented throughout the course of Project construction will include, but will not be limited to, the following:</p> <ul style="list-style-type: none"> • Limit number of simultaneous track closures within each immediate vicinity, with closure timeframe limited as much as feasible for each closure, unless bypass tracks or alternative routes are available. • Provide safety measures for freight and passenger rail operation through construction zones. • Require contractors to coordinate with rail dispatch to minimize disruption of rail service in the corridor. • Where feasible, limit closure of any tracks for construction activities to periods when passenger service is not scheduled or is less frequent (e.g., weekends, or midday and late evening periods on weekdays). • Where feasible, maintain acceptable service access for passenger and freight operation. 	Contractor	X	X			<p>Authority shall include as contract requirement.</p> <p>Contractor shall prepare a railway disruption control for Authority review and approval prior to construction. After Authority approval, the plan shall be provided to UPRR for review and approval.</p>	<p>Authority review and approval of railway disruption control plan prior to construction.</p> <p>UPRR review and approval prior to construction.</p>

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
		Pre-Construction	Construction	Post-Construction	Operation		
<ul style="list-style-type: none"> Where one open track cannot be maintained for passenger or freight use, limit multi-track closures to one location at a time, as much as feasible. Where multi-track closures result in temporary suspension of passenger rail service, work with local and regional transit providers to provide alternative transit service around the closure area (e.g., increased bus and shuttle service). Where multi-track closures result in temporary suspension of freight rail service, work with UPRR and freight users to schedule alternative freight service timing to minimize disruption to freight customers. Where such closures will result in substantial diversion to trucks, the Authority or its construction contractor will coordinate with local jurisdictions and freight carriers to determine preferred truck routes to minimize the effect on the circulation system. Provide advance notice of construction-related track closures to all affected parties. Provide advance notice to transit riders of any temporary disruption in passenger rail service. Coordinate with UPRR in advance and during any potential disruption to freight operation and/or UPRR facilities and maintain emergency access for UPRR for the duration of construction. 							
<p>TRA-1.3: BART railway disruption control plan for project construction.</p> <p>The Authority will minimize disruption to BART service and access to the BART Dublin/Pleasanton Station during construction of the Proposed Project, while allowing for expeditious completion of construction. Measures that will be implemented throughout the course of construction of the Proposed Project will include, but will not be limited to, the following:</p> <ul style="list-style-type: none"> Full access to the Dublin/Pleasanton BART Station will be maintained through on-site pedestrian detours if needed. Detour plans will be developed with BART and submitted for approval by BART. A detailed construction staging plan will be prepared and will include details to maintain BART station access during the freeway median widening phase. The construction staging plan will also address any disruption to the existing undercrossing for bicyclists, pedestrians, and transit users; if necessary, at least one travel lane / path of travel will be maintained to ensure that two-way circulation can be provided with the use of flaggers. No disruptions to BART service are expected. Any construction activities that directly impact the BART Station, like cutting through the BART concourse wall for the new access location, shall be done outside BART service hours. For temporary displacement of parking at the Dublin/Pleasanton Station, the Authority and/or its contractor will identify on-site replacement parking during the final design phase to mitigate for temporary parking impacts. In concept, the three displaced ADA parking spaces can be accommodated through other existing nearby spaces, the displaced employee spaces can be accommodated through existing customer spaces, and the resultant displaced customer spaces could be accommodated either through parking in adjacent areas or through the use of valet parking. The Authority and/or its contractor shall coordinate with BART for their input and approval regarding temporary parking plans. The existing BART tail tracks shall be protected in place and remain operational throughout construction. Provide safety measures for BART operation through construction zones. While not anticipated, where transit access to or through the BART stations is required, work with local and regional transit 	Contractor	X	X		<p>Authority shall include as contract requirement.</p> <p>Contractor shall prepare a railway disruption control plan for Authority review and approval prior to construction. After Authority approval, the plan shall be provided to BART for review and approval.</p>	<p>Authority review and approval of railway disruption control plan prior to construction.</p> <p>BART review and approval prior to construction.</p>	

Mitigation Measure	Implementing, Reporting and Monitoring Responsibilities	Mitigation Timing				Implementation and Reporting Schedule	Implementation Mechanism or Tool
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<p>providers to provide alternative transit service around the closure area (e.g., increased bus and shuttle service).</p> <ul style="list-style-type: none"> • Provide advance notice to transit riders of any temporary changes in parking or access. • Coordinate with BART in advance and during construction, and maintain emergency access for BART for the duration of construction. 							
<p>USS-1.1: Implement a utility relocation plan.</p> <p>The Authority will coordinate with all utility providers during final design and construction stages to identify utilities potentially impacted by the Proposed Project, including existing and planned utilities. A utility relocation plan will be developed and implemented to minimize service interruption and safely relocate, repair, or replace affected utilities. The Authority will assist utility owners in developing a communications plan to inform end users of potential planned service interruptions.</p>	Contractor	X	X		<p>Authority shall include as contract requirement.</p> <p>Contractor shall prepare a utility coordination plan and a utility relocation plan for Authority review and then provide this to affected utilities for review.</p>	<p>Authority review and approval of utility coordination plan and utility relocation plan prior to construction; documentation of acceptance by affected utilities.</p>	

7.0 Referenced Tables

Table 3.4-11. Summary of Required Mitigation Measures for Biological Resources

Mitigation Measure	Tri-Valley Alignment	Dublin/Pleasanton Station	Isabel Station	Southfront Road Station	Altamont Alignment	Owens-Illinois Industrial Lead variant 1, single track	Owens-Illinois Industrial Lead variant 2, double track	Stone Cut Alignment	Mountain House Station Alternative	Tracy OMF	Interim OMF	Tracy to Lathrop Alignment Variant 1, Single Track	Tracy to Lathrop Alignment Variant 2, Double Track	River Islands Station	North Lathrop Station
BIO-1.1: Conduct preconstruction surveys for special-status plant species	x	—	x	—	x	x	x	x	x	x	x	x	x	x	—
BIO-1.2: Prepare a salvage, relocation, or propagation and monitoring plan for special-status plant species	x	—	x	—	x	x	x	x	x	x	x	x	x	x	—
BIO-1.3: Document affected special-status plant species	x	—	x	—	x	x	x	x	x	x	x	x	x	x	—
BIO-1.4: Prevent introduction or spread of invasive plant species	x	—	x	—	x	x	x	x	x	x	x	x	x	x	—
BIO-2.1: Obtain coverage from, be consistent with, and tier from existing conservation strategies as feasible	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BIO-2.2: Conduct a worker environmental training program for construction personnel	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BIO-2.3: Implement noise reduction measures for pile driving in or adjacent to streams and wetlands as feasible	—	—	—	—	x	x	x	—	—	—	—	x	x	—	—
BIO-2.4: Implement seasonal restrictions for in-water work as feasible	—	—	—	—	x	x	x	—	—	—	—	x	x	—	—
BIO-2.5: Protect wetlands during construction	x	—	x	—	x	x	x	x	x	x	x	x	x	x	—
BIO-2.6: Protect sensitive natural communities, including riparian habitat and salt grass flats, during construction	x	—	x	—	x	x	x	x	—	—	x	x	x	x	—
BIO-2.7: Protect vernal pool–endemic species	x	—	—	—	x	x	x	x	—	—	—	—	—	—	—
BIO-2.8: Protect valley elderberry longhorn beetle	—	—	—	—	—	—	—	—	—	—	—	x	x	x	—
BIO-2.9: Protect California tiger salamander, western spadefoot toad, and California red-legged frog	x	—	x	—	x	x	x	x	x	—	x	x	x	—	—
BIO-2.10- Protect foothill yellow-legged frog	x	—	x	—	x	x	x	x	—	—	—	x	x	—	—
BIO-2.11: Protect western pond turtle and giant garter snake	x ^a	—	x ^a	—	x ^a	x ^a	x ^a	—	—	—	—	x	x	—	—

Mitigation Measure	Tri-Valley Alignment	Dublin/Pleasanton Station	Isabel Station	Southfront Road Station	Altamont Alignment	Owens-Illinois Industrial Lead variant 1, single track	Owens-Illinois Industrial Lead variant 2, double track	Stone Cut Alignment	Mountain House Station Alternative	Tracy OMF	Interim OMF	Tracy to Lathrop Alignment Variant 1, Single Track	Tracy to Lathrop Alignment Variant 2, Double Track	River Islands Station	North Lathrop Station
BIO-2.12: Protect California legless lizard, California glossy snake, coast horned lizard, and San Joaquin coachwhip	x	—	—	—	x	x	x	x	x	—	—	x	x	—	—
BIO-2.13: Protect special-status and non-special-status nesting birds	—	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BIO-2.14: Protect golden eagles	x	—	—	—	x	x	x	x	x	—	—	x	x	—	—
BIO-2.15: Protect Swainson’s hawk nests	x	—	—	—	x	x	x	x	x	x	—	x	x	x	x
BIO-2.16: Compensate for Swainson’s hawk foraging habitat loss	—	—	—	—	x	x	x	x	x	—	—	x	x	x	—
BIO-2.17: Protect burrowing owls and burrowing owl habitat	x	—	x	x	x	x	x	x	x	—	—	—	—	x	x
BIO-2.18: Compensate for burrowing owl habitat loss	x	—	x	x	x	x	x	x	x	x	—	x	x	x	x
BIO-2.19: Protect special-status and non-special-status roosting bats	x	x	x	x	x	x	x	x	x	x	—	x	x	x	x
BIO-2.20: Protect riparian brush rabbit	—	—	—	—	—	—	—	—	—	—	—	—	—	x	—
BIO-2.21: Compensate for riparian brush rabbit habitat loss	—	—	—	—	—	—	—	—	—	—	—	—	—	x	—
BIO-2.22: Protect American badger, San Joaquin kit fox, mountain lion, and their habitat	x	—	—	—	x	x	x	x	x ^b	x ^b	—	x ^b	x ^b	x ^b	x ^b
BIO-2.23: Compensate for American badger, San Joaquin kit fox, and mountain lion habitat loss	x	—	—	—	x	x	x	x	x	x	—	x	x	x	x
BIO-2.24: Protect Crotch bumble bee and western bumble bee nesting habitat and floral resources	x	—	—	—	x	x	x	x	x	x	—	x	x	x	x
BIO-2.25: Compensate for Crotch bumble bee and western bumble bee habitat loss	x	—	—	—	x	x	x	x	x	x	—	x	x	x	x
BIO-3.1: Develop and implement a hydroacoustic monitoring plan to minimize noise effects on fish	—	—	—	—	—	—	—	—	—	—	—	—	x	—	—
BIO-4.1: Protect nesting birds during maintenance activities	—	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BIO-4.2: Protect roosting bats during maintenance activities	—	—	x	x	x	x	x	x	x	x	x	x	x	x	x
BIO-4.3: Minimize permanent intermittent impacts on avian and bat wildlife species due to the Altamont OCS and aerial structures	—	—	—	—	x	x	x	x	—	—	—	—	—	—	—

Mitigation Measure	Tri-Valley Alignment	Dublin/Pleasanton Station	Isabel Station	Southfront Road Station	Altamont Alignment	Owens-Illinois Industrial Lead variant 1, single track	Owens-Illinois Industrial Lead variant 2, double track	Stone Cut Alignment	Mountain House Station Alternative	Tracy OMF	Interim OMF	Tracy to Lathrop Alignment Variant 1, Single Track	Tracy to Lathrop Alignment Variant 2, Double Track	River Islands Station	North Lathrop Station
BIO-4.4: Implement removal of carrion that may attract raptors and carnivores	—	—	—	—	x	x	x	x	—	—	—	—	—	—	—
BIO-4.5: Avoid use of second-generation anticoagulant rodenticides	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BIO-6.1: Compensate for impacts on jurisdictional wetlands and non-wetland waters of the United States (aquatic resources) prior to impacts during construction	x	—	—	—	x	x	x	x	x	—	x	x	x	x	—
BIO-7.1: Compensate for loss of riparian habitat	x	—	x	—	x	x	x	—	—	—	—	x	x	x	—
BIO-7.2: Compensate for loss of sensitive natural communities (excluding riparian and wetland habitat)	x	—	—	—	x	x	x	—	—	—	—	—	—	—	—
BIO-8.1: Design curbs to permit California tiger salamander and California red-legged frog movement	—	—	x	—	—	—	—	x	—	—	x	—	—	—	—
BIO-8.2: Install station lighting controls and fencing limitations	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BIO-8.4: Improve existing wildlife crossings and/or implement new wildlife crossing options along the Altamont Alignment and the Stone Cut Alignment Alternative	—	—	—	—	x	x	x	x	x	—	—	—	—	—	—
BIO-8.5: Improve existing wildlife crossings and/or implement new wildlife crossing options along certain portions of the Tracy to Lathrop Alignment	—	—	—	—	—	—	—	—	—	—	—	x	x	—	—
BIO-10.1 Compensate for tree removal during construction	x	—	x	x	x	x	x	x	x	x	x	x	x	x	x

^a Only the portion of this mitigation measure that relates to western pond turtle applies at these proposed or alternative facilities.

^b Only the portion of this mitigation measure that relates to American badger and San Joaquin kit fox applies at these proposed or alternative facilities.

Table 3.4-13. Regulated Trees, Relevant Activities, Replacement Requirements, and Recommended Tree Replacement Ratios

Jurisdiction	Definition of Protected Trees	Removal Permit Needed?	Pruning Permit Needed?	Replacement Requirement	Recommended Replacement Ratios
<i>Alameda County</i> (no date)	<ul style="list-style-type: none"> Any woody perennial plant with a single or multi-trunk structure at least 10 feet high and a major trunk 2 inches in diameter or larger at 54 inches above grade in county rights-of-way 	Yes, for protected trees	Yes, for protected trees; tree topping is not permitted	Replacement ratio determined by the county arborist	<u>Inside UPRR ROW:</u> 1:1 for all trees <u>Outside UPRR ROW:</u> 2:1 for protected trees 1:1 for unprotected trees
<i>City of Dublin</i> <i>Heritage Tree Ordinance (1999)</i>	<ul style="list-style-type: none"> Any oak, bay, cypress, maple, redwood, buckeye and sycamore tree having a trunk or main stem of 24 inches or more in diameter measured at 4.5 feet above natural grade 	Yes, for protected trees	No, but must follow International Society of Arboriculture guidelines for pruning	Replacement ratio determined by the city arborist	<u>Inside UPRR ROW:</u> 1:1 for all trees <u>Outside UPRR ROW:</u> 2:1 for protected trees 1:1 for unprotected trees
<i>City of Livermore</i> <i>Street Trees and Tree Preservation Ordinance, Chapter 12.20 (2016)</i>	<ul style="list-style-type: none"> Trees in Livermore with single trunks and a circumference at breast height (CBH) of 60 inches or more, multi-trunk trees, or trees in a stand that depend on each other for survival located on private property occupied by single-family residential development California native trees having a circumference of 24 inches or more (California native trees include white alder, bay, buckeye, madrone, big-leaf maps, oaks, gray pine, sycamore, California black walnut) Trees located on private property occupied by commercial, industrial, institutional, mixed- 	Yes, for protected trees	Yes, for street trees and, during project development (construction), protected trees	Replacement ratio determined by the public works department	<u>Inside UPRR ROW:</u> 1:1 for all trees <u>Outside UPRR ROW:</u> Two 15-gallon trees for each protected tree on single-family property Three 15-gallon or two 24-inch box trees for each protected tree on multi-family residential,

Jurisdiction	Definition of Protected Trees	Removal Permit Needed?	Pruning Permit Needed?	Replacement Requirement	Recommended Replacement Ratios
	<p>use, or multi-family residential uses with a CBH of 24 inches or more</p> <ul style="list-style-type: none"> • Trees on undeveloped property with a CBH of 18 inches or more • Trees located in open space or a riparian habitat area with a CBH of 18 inches or more • Trees approved as part of site plant approval or a condition of approval for a development project or trees required to be planted as mitigation • Street trees and trees designated as “ancestral trees” by the Livermore Beautification Committee 				<p>commercial, industrial, institutional, mixed-use, open space, riparian, or habitat property</p> <p>1:1 for unprotected trees</p>
<i>City of Pleasanton Tree Preservation Ordinance (2015)</i>	<ul style="list-style-type: none"> • Single-trunk trees with a 55-inch or larger CBH or multi-trunk trees with a 55-inch or larger CBH for the largest trunks • Trees 35 feet or more tall • Any tree of particular historical significance specifically designated by official action • A stand of trees, the nature of which makes each dependent upon the other for survival or the area’s natural beauty 	Yes, for protected trees	Yes. Pruning by contractor familiar with International Society of Arboriculture guidelines for protected trees	Replacement ratio determined by the community development director	<p><u>Inside UPRR ROW:</u></p> <p>1:1 for all trees</p> <p><u>Outside UPRR ROW:</u></p> <p>2:1 for protected trees</p> <p>1:1 for unprotected trees</p>
<i>San Joaquin County Tree Ordinance (1995)</i>	<ul style="list-style-type: none"> • Native oaks are defined as valley oaks with stem diameters of 15.2–81.3 centimeters (6–32 inches) for single-trunk trees and a minimum combined trunk diameter of 20.3 centimeters (8 inches) for multi-trunk trees. Interior live oaks or blue oaks have stem diameters of 10.2–81.3 centimeters (4–32 inches) for single-trunk trees and a minimum combined diameter of 15.2 centimeters (6 	Yes, for protected trees	Not stated	Native oak (3:1) or heritage oak trees (5:1) will be replaced in kind with nursery stock or acorns between October 1 and December 31 and monitored for 3 years to ensure survival	<p><u>Inside UPRR ROW:</u></p> <p>1:1 for all trees</p> <p><u>Outside UPRR ROW:</u></p> <p>5:1 for heritage oak and historical trees</p> <p>3:1 for native oak</p>

Jurisdiction	Definition of Protected Trees	Removal Permit Needed?	Pruning Permit Needed?	Replacement Requirement	Recommended Replacement Ratios
	<p>inches) for multi-trunk trees</p> <ul style="list-style-type: none"> Heritage oaks are defined as native oaks with a single-trunk diameter of 81.3 centimeters (32 inches) or more. (All stem diameters are measured 1.4 meters [4.5 feet] above the average ground elevation of the tree) Historical trees are defined as any trees or groups of trees given special recognition by the county planning commission because of size, age, location, or history 				<p>2:1 for protected trees</p> <p>1:1 for unprotected trees</p>
<i>City of Tracy Code of Ordinances, Chapter 7.08 (2016)</i>	<ul style="list-style-type: none"> Street tree: Any tree with the center of its trunk in the right-of-way or planting easement Private tree: Any tree with the center of its trunk on private property 	Yes for protected trees	Yes for street trees	Replacement trees, replaced at a 1:1 ratio, must be maintained in good condition for 2 years	<p><u>Inside UPRR ROW:</u></p> <p>1:1 for all trees</p> <p><u>Outside UPRR ROW:</u></p> <p>1:1 for protected trees</p> <p>1:1 for unprotected trees</p>
<i>City of Lathrop Municipal Code, Chapter 12 (2016)</i>	<ul style="list-style-type: none"> Any tree upon the public streets of the city or right-of-way 	Yes for protected (street) trees	Yes for protected (street) trees	Replacement trees at a 1:1 ratio	<p><u>Inside UPRR ROW:</u></p> <p>1:1 for all trees</p> <p><u>Outside UPRR ROW:</u></p> <p>1:1 for protected trees</p> <p>1:1 for unprotected trees</p>