

CALIFORNIA HIGH-SPEED TRAIN

Mitigation Monitoring and Enforcement Plan

Merced to Fresno Section

September 2012
Revision 1 April 2014



**California High-Speed Train Project EIR/EIS
Merced to Fresno Section**



Mitigation Monitoring and Enforcement Plan (MMEP)

Prepared by: Jessica J. Auck 4/9/2014
Jessica J. Auck, PMT Environmental Planner Date

Checked by: Karl Fielding 4/9/14
Karl Fielding, PMT Environmental Planner Date

Approved by: Bryan Porter 4/9/14
Bryan Porter, PMT Environmental Manager Date

Released by: Mark McLoughlin 4/9/14
Mark McLoughlin, Director of Environmental Services Date
California High-Speed Rail Authority

David Valenstein 04/10/2014
David Valenstein, Division Chief, Environment and Systems Planning Date
Federal Railroad Administration

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0	18 Sept 2012	FRA Approval of Initial Release
1	April 2014	Staff update to clarify roles and responsibilities and make revisions consistent with the Mitigation Monitoring and Reporting Program (MMRP) and CEQA Findings of Fact (<i>Rev1</i>)

Note: Signatures apply for the latest MMEP revision as noted above.

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1.0 Introduction

In February 2012, the Federal Railroad Administration (FRA) and California High-Speed Rail Authority (Authority) prepared a joint Final Project Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Merced to Fresno Section of the California High-Speed Train (HST) Project (Project). The Final Project EIR/EIS satisfies the requirements of the National Environmental Policy Act (NEPA) and is the basis for the FRA's Record of Decision (ROD). As part of the ROD, FRA has selected the north-south Hybrid Alternative and the Downtown Merced Station and Downtown Fresno Mariposa Street Station alternatives.

This Mitigation Monitoring and Enforcement Plan (MMEP) has been prepared for the Merced to Fresno Section of the HST Project and adheres to the Council on Environmental Quality's (CEQ) regulations (40 Code of Federal Regulations [CFR] Section 1505) and FRA Procedures for Considering Environmental Impacts (64 Federal Register 28545, May 26, 1999). Additionally, the FRA must adopt a monitoring and enforcement program where applicable for mitigation. On January 14, 2011, the CEQ finalized guidance entitled *Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact* (CEQ Guidance). The CEQ Guidance is intended to assist federal agencies to develop mitigation programs that provide effective documentation, implementation, and monitoring of mitigation commitments and was considered in the preparation of this MMEP.

Table 1 of the MMEP describes mitigation measures that would avoid, minimize, or compensate for potential adverse environmental impacts to construct and operate the HST Project. These measures were developed by the FRA and the Authority in consultation with appropriate agencies, as well as with input from the public, to meet the requirements of NEPA and the California Environmental Quality Act (CEQA).

The Final EIR/EIS identified certain mitigation measures required to comply with CEQA. Since such measures might not otherwise be required under NEPA, they are described in this MMEP as "voluntary" (Table 2). These "voluntary" mitigation measures are included in FRA's MMEP to provide a comprehensive mitigation strategy for the HST Project. The Authority is required to comply with all mitigation measures adopted with the ROD, including those specific to CEQA and those addressing federal laws and requirements. As a result, the measures described as "voluntary" in this MMEP will be implemented by the Authority as mitigation measures necessary to comply with CEQA. The HST Project incorporates design features and best management practices (BMPs) identified in the Final Project EIR/EIS and described in detail in a series of technical reports that accompanied preparation of the environmental document. As a result of applying these design features and BMPs, the HST Project will avoid potential adverse environmental impacts in several resource areas, including electromagnetic interference/electromagnetic fields (EMI/EMF), hydrology and water resources, geology and soils, and hazardous materials and wastes. In addition, the regulatory requirements, including permitting and coordination with regulatory agencies, for many project-related activities provide additional assurance that potential adverse environmental impacts will not occur. Representative agencies include the U.S. Fish and Wildlife Service (USFWS), U.S. Army Corps of Engineers (USACE), and Environmental Protection Agency¹ with jurisdiction under the Endangered Species Act and the Clean Water Act, respectively. Like the mitigation measures listed in Tables 1 and 2, the project design features (see Appendix A) and compliance with regulatory requirements are a condition

¹ EPA delegated authority under Section 401 of the Clean Water Act to the State of California.

of project approval and must be implemented by the Authority during design, construction, and operation of the Project.

The laws and orders the project is subject to and the design features that are part of the HST Project are described for the following resource areas in more detail in the corresponding chapters of the Final Project EIR/EIS:

- Transportation – Chapter 3.2, section 3.2.2, section 3.2.6
- Air Quality and Global Climate Change – Chapter 3.3, section 3.3.2, section 3.3.8
- Noise and Vibration – Chapter 3.4, section 3.4.2, section 3.4.6
- Public Utilities and Energy – Chapter 3.6, section 3.6.2, section 3.6.6
- Biological Resources and Wetlands – Chapter 3.7, section 3.7.2, section 3.7.6
- Hydrology and Water Resources – Chapter 3.8, section 3.8.2, section 3.8.6
- Geology and Soils – Chapter 3.9, section 3.9.2, section 3.9.6
- Hazardous Materials and Wastes – Chapter 3.10, section 3.10.2, section 3.10.6
- Safety and Security – Chapter 3.11, section 3.11.2, section 3.11.6
- Socioeconomics, Communities, and Environmental Justice – Chapter 3.12, section 3.12.2, section 3.12.6
- Station Planning, Land Use, and Development –Chapter 3.13, section 3.13.2, section 3.13.16
- Agricultural Lands – Chapter 3.14, section 3.14.2, section 3.14.6
- Parks, Recreation, and Open Space, Chapter 3.15, section 3.15.2
- Aesthetics and Visual Resources – Chapter 3.16, section 3.16.2, section 3.16.6
- Cultural and Paleontological Resources – Chapter 3.17, section 3.17.2, section 3.17.6

2.0 Mitigation Monitoring and Enforcement Plan

The environmental effects of the Hybrid Alternative and station locations for the Merced to Fresno Section of the HST Project would result in effects that would be considered significant under NEPA. Mitigation measures that would reduce or eliminate potential adverse environmental effects are described in Chapter 3 of Volume 1 of the Final Project EIR/EIS. The specific provisions contained in the MMEP are presented as a table and include the mitigation measures identified in the Final Project EIR/EIS, organized by environmental issue and topical areas addressed in the EIR/EIS. In collaboration with FRA and the appropriate agencies, the Authority may refine the means by which it will implement a mitigation measure, as long as the alternative means ensure compliance during project implementation. The MMEP describes implementation and monitoring procedural guidance, responsibilities, and timing for each mitigation measure identified in the Final Project EIR/EIS, including:

Significant Impact: Provides a brief description of the impact expected to occur from the proposed project as identified in the Final EIR/EIS.

Mitigation Measure: Provides the mitigation measure and monitoring requirements as identified the Final EIR/EIS.

Implementing Party/Monitoring/Reporting Party: Identifies the entity that will be responsible for directly implementing the mitigation measures, monitoring, and reporting. Implementation can be the responsibility of the Authority or its Contractor. Monitoring will generally be the responsibility of the Contractor, with oversight provided by the Authority during construction. Long-term mitigation monitoring responsibilities will be transitioned from the Contractor to the Authority upon completion of contractor work. The following roles are utilized in the MMRP:

Contractor Roles

- **Contractor:** Designated Contractor representative responsible for implementing or monitoring and reporting mitigation measures as specified in this MMEP.
- **Mitigation Manager:** Contractor's representative responsible for overseeing project mitigation to verify that mitigation is carried out as specified in this MMEP. Reports the status of each mitigation measure to Authority in accordance with this MMEP.
- **Contractor's Biologist:** The Contractor's Biologist is responsible for implementing mitigation measures in compliance with the terms and conditions outlined in the MMEP and U.S. Fish and Wildlife (USFWS), U.S. Army Corps of Engineers (USACE), State Water Resource Control Board (SWRCB), and California Department of Fish and Wildlife (CDFW) permits.
- **Project Biological Monitor:** The Project Biological Monitor will be approved by and report directly to the Contractor's Biologist. The Project Biological Monitor will be onsite during all ground-disturbing activities that have the potential to affect biological resources and will be the principal agent(s) in the direct implementation of the MMEP and compliance assurance.
- **Qualified Professional Archaeologist:** Contractor's archaeologist who meets the Secretary of the Interior (SOI) Standards of Archaeology. The Qualified Professional Archaeologist shall be responsible for training contractor staff, implementing mitigation, and coordinating the status of the archaeological mitigation with the Authority in accordance with this MMEP.
- **Archaeological Monitor:** Contractor's field crew responsible for field monitoring of archaeological mitigation in accordance with this MMEP. The contractor shall determine how many Archaeological Monitors are needed to satisfy the mitigation requirements.
- **Paleontological Resources Specialist (PRS):** Contractor's paleontologist responsible for determining where and when paleontological resources monitoring should be conducted. Also responsible for developing and implementing their portion of the Worker Environmental Awareness Program training.
- **Paleontological Resources Monitor (PRM):** Contractor's staff selected by the PRS to conduct paleontological monitoring for the project.

Authority Roles

- **Authority:** Designated Authority representative responsible for implementing or monitoring and reporting mitigation measures as specified in this MMEP.
- **Contractor's Biologist:** The Contractor's biologist will represent the Authority via the Contractor, and will be responsible for providing oversight to the Contractor's implementation of the biological mitigation and monitoring.
- **Post Construction Contractor:** Hired by the Authority to perform post construction activities.
- **Mitigation Timing (Implementation Schedule/Reporting Schedule):** Not all mitigation actions will occur at the same time. Depending upon the measure, it may be undertaken prior to construction, during construction, or during project operations. Measures may also be undertaken in conjunction with different construction packages or at such time as project operations reach a certain level. This column of the table identifies the stage of the project during which the mitigation action will be taken and when reporting is to occur, if reporting is required.
- **Implementation Mechanism or Tool:** Identifies the actions required to implement the measures, including any required agreements and/or conditions.

As the lead agency and proponent of this project, the Authority will implement the mitigation measures through its own actions, those of its contractors, and actions taken in cooperation with other agencies and entities. The Authority is ultimately accountable for the overall administration of the mitigation 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 as discussed above; however, the Authority will bear the primary responsibility for verifying that the mitigation measures are implemented.

The Authority defines the mitigation measures required for the project. When project work is undertaken by the Authority's contractor, the Contractor shall implement the mitigation measures that are pertinent to its scope of work. The Contractor shall monitor construction activities to ensure that the mitigation measures are being properly implemented and accurately report their activity and results to the Authority. The Authority will periodically check the Contractor's activity, reports, and effectiveness of mitigation activities.

3.0 Environmental Management System (EMS)

The Authority will implement an Environmental Management System (EMS) consisting of strategic planning, policies and procedures, organizational structure, staffing and responsibilities, milestones, schedule, and resources devoted to achieving the Authority's environmental commitments. The EMS will also include a component that tracks the implementation of mitigation measures (as well as environmental commitments, BMPs, and design features) and can produce reports on compliance. FRA will receive periodic reports on compliance and may request additional reports as necessary to ensure that the MMEP is fully implemented. This system will rely on data provided by the design-build contractor, regional consultants, and others to produce status reports regarding construction status, permitting activities, monitoring, inspections, and other compliance activities.



Table 1
Mitigation Measures and Implementation Plan

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing					Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations			
Transportation²									
Transportation mitigation measures are included in Attachment A. These mitigations have been reorganized to clarify implementation responsibilities. <i>Rev1</i>									
Air Quality and Global Climate Change									
<p>AQ#1: Regional Impacts. Construction of the HST alternatives would exceed the emissions thresholds for volatile organic compound (VOC) and nitrogen oxide (NO_x). Therefore, it could potentially cause violations of nitrogen dioxide (NO₂) and ozone (O₃) air quality standards or contribute substantially to NO₂ and O₃ existing or projected air quality violations VOC and NO_x emissions would exceed GC applicability thresholds for most of the construction phase with or without onsite mitigation (such as AQ-MM #1), and CO, PM₁₀ and PM_{2.5}, and SO₂ emissions would be below the GC thresholds for all construction years. As such, with implementation of AQ-MM#4, which will offset construction phase VOC and NO_x</p>	<p>AQ-MM#1: Reduce Criteria Exhaust Emissions from Construction Equipment. This mitigation measure will apply to heavy-duty construction equipment used during the construction phase. All off-road construction diesel equipment will use the cleanest reasonably available equipment (including newer equipment and/or tailpipe retrofits), but in no case less clean than the average fleet mix, as set forth in CARB's Non-Road/Off-Road 2007 database. The contractor will document efforts it undertook to locate newer equipment (such as, in order of priority, Tier 4, Tier 3 or Tier 2 equipment) and/or tailpipe retrofit equivalents. The contractor shall provide documentation of such efforts, including correspondence with at least two construction equipment rental companies. A copy of each unit's certified tier specification and any required CARB or SJVAPCD operating permit will be made available at the time of mobilization of each piece of equipment. The contractor shall keep a written record (supported by equipment hours meters where available) of equipment usage during project construction for each piece of equipment.</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>		X			Daily Recording/Weekly Reporting	<p>A copy of each unit's certified tier specification and any required California Air Resources Board (CARB) or San Joaquin valley Air Pollution Control District (SJVAPCD) operating permit will be made available at the time of mobilization of each piece of equipment.</p> <p>When non-retrofitted Tier 3 engines are utilized, the contractor will document that no Tier 4 equipment or emissions equivalent retrofit equipment is available or practicable for a particular equipment type. Documentation will be provided in such instances by the contractors and at least two construction equipment rental companies.</p>	
	<p>AQ-MM#2: Reduce Criteria Exhaust Emissions from On-Road Construction Equipment. This mitigation measure applies to on-road trucks used to haul construction materials, including fill, ballast, rail ties, and steel. Material hauling trucks will consist of an average fleet mix of equipment model year 2010 or newer, to the extent reasonably practicable. The contractor shall provide documentation of efforts to secure such fleet mix. The contractor shall keep a written record of equipment usage during project construction for each piece of equipment.</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>		X			Prior to construction/weekly reporting	Contract Requirements/ Specifications	
	<p>AQ-MM#4: Offset Project Construction Emissions through a SJVAPCD Voluntary Emission Reduction Agreement (VERA). The Authority and SJVAPCD will enter into a contractual agreement to mitigate the project's actual emissions that exceed thresholds by providing funds for the district's Emission Reduction Incentive Program³ (SJVAPCD, 2011) to fund grants for projects that achieve emission reductions, thus offsetting project-related impacts on air quality. The project will reduce actual construction emissions</p>	<p>Implementing Party: Contractor and Authority Monitoring/Reporting Parties: Authority & SJVAPCD</p>		X			Prior to construction/weekly reporting	The Authority and SJVAPCD will enter into a contractual agreement to mitigate the project's emissions by providing funds for the district's Emission Reduction Incentive Program to fund grants for projects that achieve emission reductions,	

² Mitigation timing for Transportation mitigations derived from MMRP Traffic Memo

³ See San Joaquin Valley Air Pollution Control District (SJVAPCD). 2011. *Grant and Incentive Programs*. Available at www.valleyair.org/Grant_Programs/GrantPrograms.htm.

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing					Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations			
emissions through the VERA program, the project would have impacts of negligible intensity for all pollutants.	that exceed significance/General Conformity thresholds for NO _x and VOC through the VERA program. At a minimum, mitigation/offsets shall occur in the year of impact, or as otherwise permitted by 40 CFR Part 93 Section 93.163.								thus offsetting project-related impacts on air quality.
AQ#2: Regional Impacts. Material hauling outside the SJVAB would exceed CEQA emission thresholds for NO _x in the Bay Area Air Quality Management District (AQMD), East Kern APCD, Mojave Desert AQMD, and the SCAQMD for certain hauling scenarios. Therefore, it could potentially cause violations of NO ₂ and O ₃ air quality standards or contribute substantially to NO ₂ and O ₃ existing or projected air quality violations in those air districts.	AQ-MM#2: Reduce Criteria Exhaust Emissions from On-Road Construction Equipment. This measure is described above in Impact AQ#1: Regional Impacts. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor.		X			Construction/Weekly reporting	Contract Requirements/ Specifications	
	AQ-MM#5: Purchase Offsets and Offsite Emissions Mitigation Associated with Hauling Ballast Material in certain air districts. Actual NO _x emissions from ballast hauling shall be reported to the South Coast AQMD and offsets purchased from the South Coast AQMD for actual emissions exceeding the thresholds. In the Bay Area AQMD, actual NO _x emissions above the district's significance threshold will be mitigated through an offsite emission mitigation program to achieve emission reduction due to material hauling in Bay Area AQMD. Potential offsite mitigation programs include the Bay Area AQMD's Carl Moyer Memorial Air Quality Standards Attainment Program (CMP) or other air district emission reduction incentive programs.	Implementing Party: Contractor and Authority Monitoring/Reporting Party: Contractor and Authority Contractor to report hauling emissions to the Authority. Authority to purchase offsets and offsite emission mitigation based on data reported from Contractor. <i>Rev1</i>	X	X			Prior to construction/weekly reporting	Authority to coordinate the purchase of offsets with pertinent AQMDs.	
AQ#3: Compliance with Air Quality Plans. Construction of the HST alternatives would exceed the emissions thresholds for VOC and NO _x . Therefore, it would conflict with the 1-hour Ozone Attainment Plan and the 8-hour Ozone Attainment Plan.	AQ-MM#1: Reduce Criteria Exhaust Emissions from Construction Equipment See description above in Impact AQ#1: Regional Impacts <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>		X			Construction/weekly reporting	A copy of each unit's certified tier specification and any required California Air Resources Board (CARB) or San Joaquin valley Air Pollution Control District (SJVAPCD) operating permit will be made available at the time of mobilization of each piece of equipment. When non-retrofitted Tier 3 engines are utilized, the contractor will document that no Tier 4 equipment or emissions equivalent retrofit equipment is available or practicable for a particular equipment type. Documentation will be provided in such instances by the contractors and at least two construction equipment rental companies.	

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	AQ-MM#2: Reduce Criteria Exhaust Emissions from On-Road Construction Equipment See description above in Impact AQ#1: Regional Impacts <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>		X			Construction/weekly reporting	Contract Requirements/Specifications
	AQ-MM#4: Offset Project Construction Emissions through a SJVAPCD Voluntary Emission Reduction Agreement (VERA). See description above in Impact AQ#1: Regional Impacts <i>Rev1</i>	Implementing Party: Contractor and Authority Monitoring/Reporting Parties: Authority & SJVAPCD <i>Rev1</i>		X			Construction/weekly reporting	The Authority and SJVAPCD will enter into a contractual agreement to mitigate the project's emissions by providing funds for the district's Emission Reduction Incentive Program to fund grants for projects that achieve emission reductions, thus offsetting project-related impacts on air quality.
	AQ-MM#3: Reduce the Potential Impact of Concrete Batch Plants. Concrete batch plants will be sited at least 1,000 feet from sensitive receptors, including daycare centers, hospitals, senior care facilities, residences, parks, and other areas where people may congregate.	Implementing Party: Contractor will identify location of concrete batch plants on construction plans and verify location is away from sensitive receptors. Monitoring/Reporting Party: Mitigation Manager will verify compliance during construction.	X	X			Construction/weekly reporting	Contract Requirements/Specifications
AQ# 4: Local Impacts. Construction of the alignment may expose sensitive receptors to temporary substantial pollutant concentrations from concrete batch plants.	AQ-MM#3: Reduce the Potential Impact of Concrete Batch Plants. Concrete batch plants will be sited at least 1,000 feet from sensitive receptors, including daycare centers, hospitals, senior care facilities, residences, parks, and other areas where people may congregate. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Construction/weekly reporting	Contract Requirements/Specifications
Noise and Vibration								
N&V# 1: Construction Noise Construction impacts would have moderate intensity under NEPA, but due to the temporary nature and adherence to local noise ordinances, construction noise and vibration impacts would not be significant under NEPA. FRA may choose to implement these mitigation measures.	N&V-MM#1: Construction Noise Mitigation Measures. Monitor construction noise to verify compliance with the limits. Provide the contractor the flexibility to meet the FTA construction noise limits in the most efficient and cost-effective manner. The contractor would have the flexibility of either prohibiting certain noise-generating activities during nighttime hours or providing additional noise control measures to meet the noise limits. To meet required noise limits, the following noise control mitigation measures will be implemented as necessary, for nighttime and daytime: <ul style="list-style-type: none"> • Install a temporary construction site sound barrier near a noise source. • Avoid nighttime construction in residential neighborhoods. • 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. • During nighttime work, use smart back-up alarms, which automatically adjust the alarm level based on the background noise level, or switch off back-up alarms and replace with spotters. • Use low-noise emission equipment. 	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>		X			Construction/weekly reporting	Contract Requirements/ Specifications

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing					Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations			
	<ul style="list-style-type: none"> Implement noise-deadening measures for truck loading and operations. Monitor and maintain equipment to meet noise limits. 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. Prohibit aboveground jackhammering and impact pile driving during nighttime hours. Minimize the use of generators to power equipment. Limit use of public address systems. Grade surface irregularities on construction sites. Use moveable sound barriers at the source of the construction activity. Limit or avoid certain noisy activities during nighttime hours. <p>To mitigate noise related to pile driving, the use of an augur to install the piles instead of a pile driver would reduce noise levels substantially. If pile driving is necessary, limit the time of day that the activity can occur.</p>								
N&V#2: Construction Vibration	<p>N&V-MM#2: Construction vibration mitigation measures. Building damage from construction vibration is only anticipated from impact pile driving at very close distances to buildings. If piling is more than 25 to 50 feet from buildings, or if alternative methods such as push piling or augur piling can be used, damage from construction vibration is not expected to occur. Other sources of construction vibration do not generate high enough vibration levels for damage to occur. When a construction scenario has been established, preconstruction surveys will be conducted at locations within 50 feet of piling to document the existing condition of buildings in case damage is reported during or after construction. Damaged buildings would be repaired or compensation paid.</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X	X	X		Ongoing monitoring during construction/post construction monitoring as needed to assess damage to buildings	Contract Requirements/Specifications	
N&V#3: Severe Operational Noise Impacts	<p>N&V-MM#3: Implement California High-Speed Train Project Noise and Vibration Mitigation Guidelines. California High-Speed Train Project Noise and Vibration Mitigation Guidelines (Guidelines) will be applied for ballast and tie track along the alignment. These Noise Guidelines will also be applied for slab track along the alignment. Various options exist to address the potentially severe noise effects from HSTs and from shifting SR 99. With input from local jurisdictions and balancing technological factors, such as structural and seismic safety, cost, number of affected receptors, and effectiveness, mitigation measures from among those identified in the Guidelines and summarized below will be selected and implemented. The mitigation measure or suite of mitigation measures for severe noise impacts will be designed to reduce the noise level from HST operations from "severe" to "moderate" according to the provisions of the FRA noise and vibration manual (FRA 2005). The Guidelines include the following mitigation measures for severe operational noise impacts:</p> <ul style="list-style-type: none"> Install sound barriers. Depending on the height and location relative to the tracks, sound barriers can achieve between 5 and 15 dB of noise reduction. The primary requirements for an effective sound barrier are that the barrier 	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor Regarding final bullet, Contractor and Authority shall work together to identify and acquire easements required to mitigate noise and vibration. <i>Rev1</i></p>	X	X	X		Construction/weekly reporting	Noise and Vibration Mitigation Guidelines	

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing					Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations			
	<p>must (1) be high enough and long enough to break the line-of-sight between the sound source and the receiver, (2) be of an impervious material with a minimum surface density of 4 pounds per square foot, and (3) not have any gaps or holes between the panels or at the bottom. Because many materials meet these requirements, aesthetics, durability, cost, and maintenance considerations usually determine the selection of materials for sound barriers. Depending on the situation, sound barriers can become visually intrusive. Typically, the sound barriers style is selected with input from the local jurisdiction to reduce the visual effect of barriers on adjacent lands uses. For example, sound barriers could be solid or transparent, of various colors, materials, and surface treatments.</p> <ul style="list-style-type: none"> The maximum sound barrier height would be 14 feet for at-grade sections; however, all sound barriers would be designed to be as low as possible while still achieving a substantial noise reduction. Berm and berm/wall combinations are the preferred types of sound barriers where space and other environmental constraints permit. Work with the communities to determine how the use and height of sound barriers would be determined using jointly developed performance criteria. Other solutions may result in higher numbers of residual impacts than reported herein. Options may be to reduce the height of sound barriers and combine barriers with sound insulation or to accept higher than the FRA's current noise thresholds. Install building sound insulation. Sound insulation of residences and institutional buildings to improve the outdoor-to-indoor noise reduction is a mitigation measure that can be provided when the use of sound barriers is not feasible in providing a reasonable level (5 to 7 dB) of noise reduction. Although this approach has no effect on noise in exterior areas, it may be the best choice for sites where sound barriers are not feasible or desirable and for buildings where indoor sensitivity is of most concern. Substantial improvements in building sound insulation (on the order of 5 to 10 dB) can often be achieved by adding an extra layer of glazing to windows, by sealing holes in exterior surfaces that act as sound leaks, and by providing forced ventilation and air conditioning so that windows do not need to be opened. Establish performance criteria to balance existing noise events and ambient roadway noise conditions as factors for determining mitigation measures. Acquire easements on properties severely affected by noise. Another option for mitigating noise impacts is for the Authority to acquire easements on residences likely to be affected by HST operations in which the homeowners would accept the future noise conditions. This approach is usually taken only in isolated cases where other mitigation options are infeasible, impractical, or too costly. <p><i>Rev1</i></p>								
	<p>N&V-MM#4: Vehicle Noise Specification. In the procurement of an HST vehicle technology, the Authority will require bidders to meet the federal regulations applicable at the time of procurement (currently a 93-dB level standard for cars operating at speeds of greater than 45 mph). Depending on the available technology, this could significantly reduce the number of impacts throughout the corridor. <i>Rev1</i></p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor</p>	X				Prior to construction/weekly reporting	HST vehicle technology procurement	
	<p>N&V-MM#5: Special Trackwork at Crossovers and Turnouts. Because</p>	<p>Implementing Party: Contractor</p>				X	Post		

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	the impacts of HST wheels over rail gaps at turnouts increases HST noise by approximately 6 dB over typical operations, turnouts can be a major source of noise impact. If the turnouts cannot be moved from sensitive areas, the project can use special types of trackwork that eliminate the gap.	Monitoring/Reporting Party: Contractor <i>Rev1</i>					Construction/Operations Monitoring. Authority to coordinate with local jurisdictions to address noise-related issues.	
	N&V-MM#6: Additional Noise Analysis During Final Design. If final design of the track base or final vehicle specifications results in changes to the assumptions underlying the noise analysis, reassess noise impacts and recommendations for mitigation and provide supplemental environmental documentation, as required by CEQA and NEPA.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prepare construction management plan/weekly reporting	Noise impact re-assessment during final project design
Biological Resources								
Bio#1: Introduction of noxious weeds.	<p>Bio-MM#4: Prepare and Implement a Weed Control Plan. Prior to ground-disturbing activities, the Contractor will prepare and implement a Weed Control Plan to minimize or avoid the spread of weeds during ground-disturbing activities. The Weed Control Plan will address the following:</p> <ul style="list-style-type: none"> Schedule for conducting noxious weed surveys to be conducted in coordination with the BRMP. Success criteria for noxious and invasive weed control as established by a qualified biologist. The success criteria will be linked to the HMMP for compensatory mitigation sites, and the standards for onsite work during construction will limit invasive species to less than 5% and non-native herbaceous species to less than 25%. If these success criteria have not been met by the end of the BRMP monitoring and implementation period, monitoring and control efforts will continue and remedial actions will be identified and implemented until success criteria are met. Based on monitoring results, additional or revised measures may be needed to ensure the introduction and spread of noxious weeds is not promoted by the construction and operation of the HST. Provisions to ensure that the development of the Weed Control Plan will be coordinated with development of the Restoration and Revegetation Plan (RRP) so that the RRP incorporates measures to reduce the spread and establishment of noxious weeds and incorporates percent cover of noxious weeds into revegetation performance standards. Identify weed control treatments including permitted herbicides, and manual and mechanical methods for application. Restrict herbicide application from use in environmentally sensitive areas (ESAs). Determine timing of the weed control treatment for each plant species. Identify fire prevention measures. <p>The Contractor will implement the Weed Control Plan during the construction period and require that maintenance crews follow the guidelines in the Weed Control Plan during the project period. The Authority or its designee will appoint the responsible party during the operations period. A monthly memorandum will be prepared by the Contractor's biologist to document the progress of the Plan and its implementation.</p>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor's biologist <i>Rev1</i>	X	X			Prior to construction/monthly memorandum to document the progress of the Weed Control Plan and implementation	Condition of Design/Build Contract Weed Control Plan

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing					Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations			
	<p>Bio-MM#5: Prepare and Implement a Biological Resources Management Plan. During final design, and prior to construction, the Contractor’s biologist will prepare the BRMP, and assemble the biological resources mitigation measures. In the BRMP, the Contractor’s biologist will include terms and conditions from applicable permits and agreements and make provisions for monitoring assignments, scheduling, and responsibility. The BRMP will also include habitat replacement and revegetation, protection during ground-disturbing activities, performance (growth) standards, maintenance criteria, and monitoring requirements for temporary and permanent native plant community impacts. The BRMP will form the parameters for the biology mitigation measures from this EIR/EIS, including terms and conditions as applicable from the USFWS, USACE, SWRCB, and CDFW permits.</p> <p>The BRMP will be prepared for all phases of project implementation, but may be exclusively prepared for each construction package.</p> <p>The goal of the BRMP is to assist the Contractor’s biologist with an organized reporting tool to ensure the mitigation measures and terms and conditions are implemented in a timely manner and are reported on. These include all avoidance, minimization, repair, mitigation, and compensatory actions stated in the mitigation measures or terms and conditions from the permits referenced above. These measures and conditions are tracked through final design, implementation, and post-construction phases. Specific performance standards are habitat-based and are related to success of onsite or offsite repair of temporary impacts, or more permanent impacts that are compensated at an offsite location. Habitat-based mitigation applies to compensatory mitigation or permittee-responsible mitigation for impacts on special-status plants, special-status wildlife, special-status plant communities, or jurisdictional waters and are generally addressed in the Bio-MM#58 as part of the HMMP. Performance standards are targets for determining the effectiveness of the mitigation and assessing the need for adaptive management (e.g., mitigation design or maintenance revisions). Success criteria are formal criteria that must be met after a specific timeframe to meet regulatory requirements of the permitting agencies. These are habitat-based performance standards that include consideration for the establishment of a species or habitat. Since species are nested within habitats, the performance standards are primarily based on vegetation, substrate, and hydrology conditions. The performance standards for the establishment of any temporary or permanent impacts on these resources are recognized in those resource categories, but are more specifically covered in the specific performance standards/guidelines shown in Bio-MM#56. The overarching goal is to neutralize the impacts with respect to species and habitat impacted. The BRMP will help the long-term perpetuation of biological resources within the temporarily disturbed areas, as well as protect adjacent targeted habitats. The BRMP will contain but not be limited to the following information:</p> <ol style="list-style-type: none"> Specific measures for the protection of special-status species. Identification (on construction plans) of the locations and quantity of habitats to be avoided or removed, including locations where habitats are to be restored. Procedures for vegetation analyses of temporarily impacted habitats to approximate their relative composition, as well as procedures for site preparation, irrigation, planting, and maintenance. This information may be 	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X					<p>Following implementation and reporting schedule as established by agency permit conditions.</p>	<p>Condition of Design/Build Contract. Biological Resources Management Plan (BRMP) and Construction plans</p>

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing					Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations			
	<p>used to determine the requirements of the revegetation areas for both onsite temporary impacts and offsite compensatory sites.</p> <p>d. Sources of plant materials and methods of propagation.</p> <p>e. Specific parameters for determining the amount of replacement habitat for temporary disturbance areas identified consistent with mitigation ratios and permit conditions.</p> <p>f. Specification of parameters for maintenance and monitoring of re-established habitats, including weed control measures, frequency of field checks, and monitoring reports for temporary disturbance areas.</p> <p>g. Specification of performance standards for the re-established plant communities within the construction limits.</p> <p>h. Remedial measures, such as a form of adaptive management, to be taken if performance standards are not met.</p> <p>i. Methodologies and requirements for monitoring the restoration/replacement efforts, which will be a combination of qualitative and quantitative data consistent with mitigation measures and permit conditions.</p> <p>j. Measures to preserve topsoil and control erosion.</p> <p>k. Design of protective fencing around ESAs and ERAs and the construction staging areas.</p> <p>l. Specification of location and quantities of gallinaceous guzzlers (catch basin/artificial watering structures) if needed; specification of monitoring of water levels in guzzlers.</p> <p>m. Location of trees to be protected as wildlife habitat (roosting sites) and locations for planting replacement trees.</p> <p>n. Specification of the purpose, type, frequency, and extent of chemical use for insect and disease control operations as part of vegetative maintenance within sensitive habitat areas.</p> <p>o. Specific construction monitoring programs for habitats of concern and special-status species, as needed.</p> <p>p. Specific measures for the protection of vernal pool habitat and riparian areas. These measures may include but are not limited to: erosion and siltation control measures, protective fencing guidelines, dust control measures, grading techniques, construction area limits, and biological monitoring requirements.</p> <p>q. Provisions for biological monitoring during ground-disturbing activities to confirm compliance and success of protective measures. The monitoring procedures will: (1) identify specific locations of wildlife habitat and sensitive species to be monitored, (2) identify the frequency of monitoring and the monitoring methodology (for each habitat and sensitive species to be monitored), (3) list required qualifications of biological monitor(s), and (4) identify reporting requirements.</p>								
Bio#2: Construction of the HST alternatives would disturb Great Valley mixed riparian forest and other	<p>Bio-MM#4: Prepare and Implement a Weed Control Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds. <i>Rev1</i></p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X	X			Prior to construction/monthly memorandum to document the progress of the Weed Control Plan and implementation	Condition of Design/Build Contract Weed Control Plan	

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
riparian habitat.	<p>Bio-MM#5: Prepare and Implement a Biological Resources Management Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds. <i>Rev.1</i></p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X				Following implementation and reporting schedule as established by agency permit conditions.	Condition of Design/Build Contract Biological Resources Management Plan (BRMP) and Construction plans
	<p>Bio-MM#6: Prepare and Implement a Restoration and Revegetation Plan. During final design, the Contractor's Biologist will prepare a restoration and revegetation plan (RRP) for upland communities. Contractor's biologist This is a complement for site restoration in addition to the temporary effects for riparian plant communities (Bio-MM#15) and for jurisdictional waters (Bio-MM#44). In the RRP, address impacts on habitat subject to temporary ground disturbances that will require decompaction or regrading, if appropriate. The standards for onsite work during construction will limit invasive species to less than 5% and nonnative herbaceous species to less than 25% unless otherwise called out in the final approved seed mix. Contractor's biologist During ground-disturbing activities, the Contractor will implement the RRP in temporarily disturbed areas. The Contractor's biologist will prepare and submit compliance reports to document implementation. The RRP compliance reports will be prepared and submitted to the Mitigation Manager. <i>Rev1</i></p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X	X	X		Prior to construction. Follow reporting requirements as established by agency permit conditions.	Condition of Design/Build Contract. Restoration and Revegetation Plan (RRP) for upland communities and Compliance reports to document implementation and performance standards
	<p>Bio-MM#7: Delineate Environmentally Sensitive Areas and Environmentally Restricted Areas (on plans and in-field). Prior to ground-disturbing activities, to the extent practicable, the Contractor's biologist will verify that environmentally sensitive areas (ESAs) and environmentally restricted areas (ERAs) are delineated as appropriate. ESAs are areas within the construction zones containing suitable habitat for special-status species and habitats of concern that may allow construction activities, but have restrictions based on the presence of special-status species or habitats of concern at the time of construction. ERAs are areas outside the construction footprint that must be protected in-place during all construction activities. Prior to ground-disturbing activities, the Contractor's Biologist will include all ESAs and ERAs on final construction plans (including grading and landscape plans). Prepare, review and approve the map of all ESAs and ERAs on the design drawings and work to update the map as necessary. Prior to ground-disturbing activities, the Contractor will mark ESAs and ERAs with high visibility temporary fencing to prevent encroachment of construction personnel and equipment onto sensitive areas. Designate the two categories, ESA and ERA, differently in the field (e.g., different colored flagging/fencing). Use sub-meter accurate GPS equipment to delineate all ESAs and ERAs. Remove ESA and ERA fencing when construction is complete or the resource has been cleared according to agency permit conditions and construction drawings and specifications. The Contractor's biologist will submit memoranda regarding the field delineation of all ESAs/ERAs to the Mitigation Manager. These areas will receive ongoing monitoring during site preparation and construction activities.</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X	X			Prior to construction/Post construction. Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	Bio-MM#8: Equipment Staging Areas. Prior to ground-disturbing activities, the Contractor will locate staging areas for construction equipment outside sensitive biological resources including habitat for special-status species, habitats of concern(e.g., wetlands, waters of the U.S., riparian communities), and wildlife movement corridors, to the maximum extent possible. The Contractor's biologist will submit memoranda to the Mitigation Manager documenting compliance. Where avoidance is not feasible the permitting authorities need to be contacted for modification to permits, as required by law.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract
	Bio-MM#10: Vehicle Traffic. During ground-disturbing activities, the Contractor will restrict project-related vehicle traffic, within the construction area, to established roads, construction areas, and other designated areas. Establish vehicle traffic locations disturbed by previous activities to prevent further adverse effects. Observe a 20 mph speed limit for construction areas with potential special-status species habitat. Clearly flag and mark access routes and prohibit off-road traffic. The Contractor's biologist will submit a memorandum to the Mitigation Manager documenting compliance on a weekly basis.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Report on weekly basis.	Condition of Design/Build Contract
	Bio-MM#15: Restore Temporary Riparian Impacts. During post-construction, the Contractor's Biologist will revegetate all disturbed riparian areas using appropriate native plants and seed mixes. The Contractor's biologist will monitor restoration activities consistent with provisions in the HMMP. The Contractor's biologist will submit a memorandum to the Mitigation Manager documenting compliance and other reporting requirements in the 1600 Streambed Alteration Agreement.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>			X		Post-construction. Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract Habitat Mitigation and Monitoring Plan (HMMP) and Memorandum documenting compliance and other reporting requirements in the 1600 Streambed Alteration Agreement.
Bio#3: Construction of the HST alternatives would disturb suitable habitat that has potential to support special-status plant species.	Bio-MM#3: Prepare and Implement a Worker Environmental Awareness Program. Prior to ground-disturbing activities, the Mitigation Manager or designee will prepare and implement a WEAP for construction crews. WEAP training materials will include the following: discussion of the federal ESA, CESA, BGEPA, and the MBTA; consequences and penalties for violation or noncompliance with these laws and regulations and project permits; identification and value of special-status plants, special-status wildlife, jurisdictional waters, and special-status plant communities; hazardous substance spill prevention and containment measures; the contact person in the event of the discovery of a dead or injured wildlife species; and review of mitigation measures. In the WEAP, the Mitigation Manager will detail construction timing in relation to habitat and species' life stage requirements and discuss project maps, showing areas of planned minimization and avoidance measures. A fact sheet prepared by the Mitigation Manager conveying this information will be prepared for distribution to the construction crews and to other individuals who enter the construction footprint. Upon completion of the WEAP training, construction crews will sign a form stating that they attended the training and understand and will comply with the information presented. Construction crews will be informed during the WEAP training that, to the extent possible, travel within the marked project site will be restricted to established roadbeds. Established roadbeds include all pre-existing and project-constructed unimproved, as well as improved roads.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Training of all crew/construction personnel prior to start of construction. Provide weekly/monthly reporting as required by permit conditions.	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	Bio-MM#4: Prepare and Implement a Weed Control Plan. See description above in Impact Bio #1: Introduction of Noxious Weeds. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction/monthly memorandum to document the progress of the Weed Control Plan and implementation	Condition of Design/Build Contract
	Bio-MM#5: Prepare and Implement a Biological Resources Management Plan. See description above in Impact Bio #1: Introduction of Noxious Weeds. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Following implementation and reporting schedule as established by agency permit conditions.	Condition of Design/Build Contract. Biological Resources Management Plan (BRMP) and Construction plans
	Bio-MM#6: Prepare and Implement a Restoration and Revegetation Plan. See description above in Impact Bio#2: Construction of the HST alternatives would disturb Great Valley mixed riparian forest and other riparian habitat. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X	X		Prior to construction. Follow reporting requirements as established by agency permit conditions.	Condition of Design/Build Contract. Restoration and Revegetation Plan (RRP) for upland communities and Compliance reports to document implementation and performance standards
	Bio-MM#7: Delineate Environmentally Sensitive Areas and Environmentally Restricted Areas (on plans and in-field). See description above in Impact Bio#2: Construction of the HST alternatives would disturb Great Valley mixed riparian forest and other riparian habitat. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction/Post construction. Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract
	Bio-MM#8: Equipment Staging Areas. See description above in Impact Bio#2: Construction of the HST alternatives would disturb Great Valley mixed riparian forest and other riparian habitat. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract
	Bio-MM#10: Vehicle Traffic. See description above in Impact Bio#2: Construction of the HST alternatives would disturb Great Valley mixed riparian forest and other riparian habitat. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Report on weekly basis.	Condition of Design/Build Contract
	Bio-MM#14: Post-Construction Compliance Reports. After each construction period is completed, the Contractor's biologist will submit post-construction compliance reports consistent with the appropriate agency (e.g., UFSWS, NMFS and CDFW) protocols, including compliance with resource agency permits (i.e., Section 7 of FESA, Section 2081 of CESA and Section 401 and 404 of FCWA and 1600 of Fish and Game Code). The Contractor's biologist will submit a memorandum to the Mitigation Manager documenting compliance. The frequency of the memorandum compilation and submission will be consistent with regulatory compliance permits.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor Each Contractor will submit a Post-Construction Compliance Report at substantial contract completion for its own scope of work. The Authority will aggregate all reports and continue post-construction compliance reporting as required. <i>Rev1</i>			X		Post-construction. Follow reporting requirements as established by regulatory compliance permits.	Condition of Design/Build Contract
	Bio-MM#17: Conduct Pre-Construction Surveys for Special-Status Plant Species. The Contractor's biologist will conduct pre-construction surveys for special-status plant species in suitable habitat areas, subject to ground-disturbing activities. The surveys will be conducted in the appropriate season prior to ground-disturbing activities for salvage and relocation opportunities. The Contractor's biologist will use the results of the Special-Status Plants	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Prior to ground-disturbing activities for salvage and relocation activities. Report on weekly basis.	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	<p>Survey Report (prepared as part of the Biological Resources Technical Report), including mapping of locations of special-status plant species, to determine focused locations for the pre-construction surveys, as appropriate. The Contractor's biologist will work with the Contractor's Biologist to mark and avoid locations of all special-status plant species observed where feasible or incorporate the species into the relocation/compensation program defined in Bio-MM#50: Compensate for Impacts on Special-Status Plant Species.</p> <p>Prior to ground-disturbing activities, the Contractor will protect any populations of special-status plant species identified during the surveys within 100 feet of the construction footprint as ERAs. As appropriate, the Contractor's Biologist will update the special-status or habitats of concern mapping within the construction limits, based upon resource agency permits. The Contractor's Biologist will determine the locations of special-status plant species on construction drawings and identified as ESAs within the construction footprint. Plant populations within 100 feet of the construction limits will be fenced as ERAs by the Contractor's Biologist. Terms and conditions from Section 7 and Section 2081 agreements will be incorporated as appropriate. The Contractor's biologist will provide verification and report through memorandum to the Mitigation Manager.</p>							
	<p>Bio-MM#18: Prepare and Implement Plan for Salvage, Relocation, and/or Propagation of Special-Status Plant Species. The Contractor's Biologist will prepare a plan prior to ground-disturbing activities to address monitoring, salvage, relocation, and propagation of special-status plant species. The plan will be submitted to the Contractor's biologist for concurrence. The relocation or propagation of plants and seed will be performed at a suitable mitigation site, as appropriate per species. Documentation 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. Permit conditions issued by the appropriate resource agencies (e.g., USFWS, CDFW) will guide the development of the plan and performance standards. The Contractor's biologist will submit a memorandum to the Mitigation Manager documenting compliance.</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X		X		Pre-construction and prior to ground-disturbing activities. Follow reporting requirements as established by regulatory compliance permits.	Condition of Design/Build Contract
	<p>Bio-MM#19: Conduct Pre-Construction Sampling and Assessment for Vernal Pool Fauna. Prior to ground-disturbing activities, the Contractor's biologist will conduct pre-construction, non-protocol surveys in seasonally inundated habitats (seasonal wetland, non-inundated wetlands) within the construction footprint. The Contractor's biologist will conduct general aquatic surveys at a suitable interval after the first significant storm event of the rainy season (October 15 to June 1), as feasible prior to ground-disturbing activities. The sampling is an assessment of the hydrological, biological and ecological conditions of each seasonal wetland and open waters. This assessment will determine the quality and suitability of seasonal wetlands for special-status species (e.g., vernal pool branchiopods, western spadefoot toads, and California tiger salamanders) and later assist in determining which materials (e.g., soils, viable plant seeds, vernal pool cysts) may be collected. The sampling is an assessment that will be useful in understanding the species present and will help guide the implementation of performance standards to be consistent with Bio-</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>						

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	<p>MM#20: Implement and Monitor Vernal Pool Protection, for vernal pool special-status species (e.g., vernal pool branchiopods, western spadefoot toads, and California tiger salamanders).The Contractor’s biologist will submit a report within 1 month of completing the field work and submit to the Mitigation Manager and Authority or its designee. The report will provide the documentation and the results of the sampling, including the results of the data collected and compared with the performance standards.</p> <p>All project construction personnel will be trained to recognize and avoid special-status species and their habitat (Bio-MM#3). The Weed Control Plan prepared and implemented (Bio-MM#4) will ensure that noxious weeds to not invade areas disturbed by project construction activities. The Plan will have specific success criteria in terms of future presence of invasive and non-native plant species in restored areas. Implementation of The Weed Control Plan will be integrated with the RRP (Bio-MM#6), and will be implemented and reported as part of the overall BRMP (Bio-MM#5). Prior to project construction ESAs and ERAs, which will include riparian areas adjacent to project construction, will be identified and delineated (Bio-MM#7) to prevent impacts to sensitive areas outside the approved project footprint. Construction equipment will be staged in non-sensitive areas (Bio-MM#8). During project construction vehicle routes and speeds will be controlled to minimize impact on sensitive habitats (Bio-MM#10). Riparian areas temporarily impacted through construction will be through a long-term restoration and monitoring program (Bio-MM#15). A plan will be implemented within the construction footprint and other areas potentially affected by construction activity to guide the salvage, relocation, and propagation special-status plant species (Bio-MM#18). This examination will include sampling and assessment of vernal pools (Bio-MM#19), which will provide baseline data necessary for formulation of performance standards necessary for subsequent mitigation of impacts to vernal pools and other aquatic resources. All of these activities will be documented though post-construction compliance reports (Bio-MM#14). <i>Rev1</i></p>							
Bio#4: Construction of the HST alternatives would disturb suitable habitat that has potential to support vernal pool branchiopods	<p>Bio-MM#3: Prepare and Implement a Worker Environmental Awareness Program. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has the potential to support special-status plant species. <i>Rev1</i></p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X	X			Training of all crew/construction personnel prior to start of construction. Provide weekly/monthly reporting as required by permit conditions.	Condition of Design/Build Contract
	<p>Bio-MM#4: Prepare and Implement a Weed Control Plan. See description above in Impact Bio #1: Introduction of Noxious Weeds.</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X	X			Prior to construction/monthly memorandum to document the progress of the Weed Control Plan and implementation	Condition of Design/Build Contract
	<p>Bio-MM#5: Prepare and Implement a Biological Resources Management Plan. See description above in Impact Bio #1: Introduction of Noxious Weeds.</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X				Following implementation and reporting schedule as established by agency permit conditions.	Condition of Design/Build Contract. Biological Resources Management Plan (BRMP) and Construction plans

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	Bio-MM#6: Prepare and Implement a Restoration and Revegetation Plan. See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X	X		Prior to construction. Follow reporting requirements as established by agency permit conditions.	Condition of Design/Build Contract. Restoration and Revegetation Plan (RRP) for upland communities and Compliance reports to document implementation and performance standards
	Bio-MM#7: Delineate Environmentally Sensitive Areas and Environmentally Restricted Areas (on plans and in-field). See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction/Post construction. Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract
	Bio-MM#8: Equipment Staging Areas. See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract
	See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Report on weekly basis.	Condition of Design/Build Contract
	Bio-MM#12: Work Stoppage. During ground-disturbing activities, the Contractor's biologist will halt work in the event that a special-status wildlife species gains access to the construction footprint. This work stoppage will be coordinated with the resident engineer and/or the Authority or its designee. At this direction the Contractor will suspend ground-disturbing activities in the immediate construction area that could reasonably result in a "take" of special-status wildlife species. The Contractor will continue the suspension until the individual leaves voluntarily, is relocated to a release area using USFWS- and/or CDFW-approved handling techniques and relocation methods, or as required by USFWS or CDFW. The Contractor's biologist will submit a memorandum to the Mitigation Manager documenting compliance within 1 day of the work stoppage and subsequent action. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Submit a memorandum to the Mitigation Manager documenting compliance within 1 day of the work stoppage and subsequent action.	Condition of Design/Build Contract
	Bio-MM#14: Post-Construction Compliance Reports. See description above in Impact Bio #3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor and Authority Each Contractor will submit a Post-Construction Compliance Report at substantial contract completion for its own scope of work. The authority will aggregate all reports and continue post-construction compliance reporting as required. <i>Rev1</i>			X		Post-construction. Follow reporting requirements as established by regulatory compliance permits.	Condition of Design/Build Contract
	Bio-MM#19: Conduct Pre-Construction Sampling and Assessment for Vernal Pool Fauna. See description above in Impact Bio #3: Construction of the HST would disturb	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X	X		Prior to ground-disturbing activities Follow reporting	Condition of Design/Build Contract Plan for monitoring, salvage,

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	suitable habitat that has potential to support special-status plant species. <i>Rev1</i> Contractor's biologist						requirements as established by regulatory compliance permits.	relocation, and propagation of special-status plant species and Memorandum documenting compliance
	Bio-MM#20: Seasonal Vernal Pool Work Restriction. For seasonal avoidance of special-status vernal pool branchiopods and vernal pool-dependent species (e.g., California tiger salamander), the Contractor will not work within 250 feet of aquatic habitats suitable for these species (e.g., vernal pools and other seasonal wetlands) from October 15 to June 1 (corresponding to the rainy season), or as determined through informal or formal consultation with the USFWS or USACE. Ground-disturbing activities may begin once the habitat is no longer inundated for the season. If any work remains to be completed after October 15, exclusion fencing and erosion control measures will be placed at the vernal pools and other seasonal wetlands by the Contractor's Biologist. The fencing will act as a buffer between ground-disturbing activities and the vernal pools and other seasonal wetlands as determined through consultations with USFWS/USACE. The Contractor's biologist will document compliance through a memorandum to the Mitigation Manager during the establishment of the fencing activities.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Pre-construction and during construction. Seasonal restrictions: October 15 to June 1 (corresponding to the rainy season), or as determined through informal or formal consultation with the USFWS or USACE. Report within 1 month of completing the field work	Condition of Design/Build Contract
	Bio-MM#21: Implement and Monitor Vernal Pool Protection. If construction impacts can be avoided, the vernal pool(s) will be protected by erecting exclusion fencing. The Contractor's Biologist, under the supervision of the Contractor's biologist, will erect and maintain the exclusion fencing. For construction impacts on vernal pools and other seasonal wetlands that cannot be avoided, the Contractor's Biologist will apply geotextile fabric and a layer of gravel over the affected vernal pool(s) prior to ground-disturbing activities to protect the contours in cases where the pool is not directly and permanently impacted from the construction footprint. The Contractor will implement this measure within the construction areas during one dry season period. Resource agency consultations with the USFWS/USACE will occur as needed and based on permit conditions. <ul style="list-style-type: none"> If temporary impacts occur beyond the dry season (approximately June 1 to October 15) and the vernal pool(s) cannot be fenced, the Contractor's Biologist in coordination with the Contractor's biologist will collect a representative sampling of soils from the vernal pool(s) prior to initiating ground-disturbing activities within vernal pools. The representative soil sample(s) will contain viable plant seeds and vernal pool branchiopod cysts to be preserved from the vernal pool(s). These samples may be incorporated into other vernal pools, as applicable, with USFWS and/or CDFW consultation. If construction impacts take more than one full wet-dry season cycles, the offsite mitigation will be implemented. <i>Rev1</i>	Implementing Party: Contractor Reporting Party: Contractor's biologist If offsite mitigation is required, the Authority will be responsible for implementation, monitoring and reporting. <i>Rev1</i>	X	X	X		Prior to construction/Post Construction monitoring and reporting as determined by regulatory agency permit conditions.	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	<p>Bio-MM#44: Restore Temporary Impacts on Jurisdictional Waters. During or post-construction, the Contractor will restore disturbed jurisdictional waters using stockpiled and segregated soils. The Contractor will conduct revegetation using appropriate plants and seed mixes, and conduct maintenance monitoring consistent with the provisions in the HMMP (Bio MM#58). The Contractor's biologist will document compliance with memorandum submitted to the Authority. <i>Rev1</i></p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>		X	X		Construction and Post-construction Follow reporting as determined by regulatory agency permit conditions.	Condition of Design/Build Contract
	<p>Bio-MM#45: Monitor Construction Activities within Jurisdictional Waters. During ground-disturbing activities, the Contractor will conduct monitoring within jurisdictional waters, including monitoring of the installation of protective devices (silt fencing, sandbags, fencing, etc.), installation and/or removal of creek crossing fill, construction of access roads, vegetation removal, and other associated construction activities. The Contractor will conduct biological monitoring to document adherence to habitat avoidance and minimization measures addressed in the project mitigation measures and as listed in the USFWS, CDFW, SWRCB, and USACE permits conditions. The Contractor will report and document compliance consistent with requirements in the permitting documents, including frequency and timing and submittals. <i>Rev1</i></p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>		X	X		During ground-disturbing activities and Construction Follow reporting as determined by regulatory agency permit conditions.	Condition of Design/Build Contract
<p>Bio#5: Construction of the HST alternatives would disturb suitable habitat that has potential to support the valley elderberry longhorn beetle.</p>	<p>Bio-MM#3: Prepare and Implement a Worker Environmental Awareness Program. See description above in Impact Bio #3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X	X			Training of all crew/construction personnel prior to start of construction. Provide weekly/monthly reporting as required by permit conditions.	Condition of Design/Build Contract
	<p>Bio-MM#4: Prepare and Implement a Weed Control Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds.</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X	X			Prior to construction/monthly memorandum to document the progress of the Weed Control Plan and implementation	Condition of Design/Build Contract
	<p>Bio-MM#5: Prepare and Implement a Biological Resources Management Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds.</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X				Following implementation and reporting schedule as established by agency permit conditions.	Condition of Design/Build Contract. Biological Resources Management Plan (BRMP) and Construction plans
	<p>Bio-MM#6: Prepare and Implement a Restoration and Revegetation Plan. See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X	X	X		Prior to construction. Follow reporting requirements as established by agency permit conditions.	Condition of Design/Build Contract. Restoration and Revegetation Plan (RRP) for upland communities and Compliance reports to document implementation and performance standards

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	Bio-MM#7: Delineate Environmentally Sensitive Areas and Environmentally Restricted Areas (on plans and in-field). See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction/Post construction. Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract
	Bio-MM#8: Equipment Staging Areas. See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract
	Bio-MM#10: Vehicle Traffic. See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Report on weekly basis.	Condition of Design/Build Contract
	Bio-MM#11: Entrapment Prevention. The Contractor will cover all excavated, steep-sided holes or trenches, more than 8 inches deep, at the close of each working day with plywood or similar materials, or provide a minimum of one escape ramp per 10 feet of trenching constructed of earth fill. The Contractor will thoroughly inspect such holes or trenches for trapped animals before leaving the construction site each day. Prior to construction, the Contractor's Biologist will screen all culverts, or similar enclosed structures, with a diameter of 4 inches or greater to prevent use by wildlife. The Contractor will ensure that cleared and stored material at the construction site for common and special-status wildlife species before the material is subsequently used or moved. The Contractor's biologist will submit a memorandum to the Authority documenting compliance on a weekly basis. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Report on weekly basis.	Condition of Design/Build Contract
	Bio-MM#12: Work Stoppage. See description above in Impact Bio #4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Submit a memorandum to the Mitigation Manager documenting compliance within 1 day of the work stoppage and subsequent action.	Condition of Design/Build Contract
	Bio-MM#13: 'Take' Notification and Reporting. The Contractor Contractor's biologist will notify the USFWS and/or CDFW immediately in the case of an accidental death or injury to a federal or state-listed species during project-related activities. The Authority or its designee will be notified prior to the notification to the agencies. The Contractor's biologist will submit a memorandum to the Authority documenting compliance. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Following incident, immediately report to USFWS and/or CDFW. Prepare report and document in weekly/monthly report.	Condition of Design/Build Contract
	Bio-MM#14: Post-Construction Compliance Reports. See description above Impact Bio # 3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Authority Each Contractor will submit a Post-Construction Compliance Report at substantial contract completion for its own scope of			X		Post-construction. Follow reporting requirements as established by regulatory compliance permits.	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
		work. The Authority will aggregate all reports and continue post-construction compliance reporting as required. <i>Rev1</i>						
	<p>Bio-MM#22: Implement Conservation Guidelines During the Construction Period for Valley Elderberry Longhorn Beetle. Prior to and during ground-disturbing activities, the Contractor will implement the avoidance and minimization measures detailed in the <i>Conservation Guidelines for the Valley Elderberry Longhorn Beetle</i> (USFWS 1999a). These measures include establishing and maintaining appropriate buffer areas around elderberry plants, surveying for beetle boreholes in affected shrubs, restricting the use of chemicals that might harm beetles, and mowing. After ground-disturbing activities are completed, restore any damage to buffer areas containing elderberry shrubs according to specifications within the <i>Conservation Guidelines for the Valley Elderberry Longhorn Beetle</i> (USFWS 1999a).</p> <p>In areas where encroachment on the 100-foot buffer has been approved by USFWS, the Contractor will provide a minimum setback of at least 20 feet from the dripline of each Mexican elderberry plant. In buffer areas, ground-disturbing activities should be minimized, and any damaged area should be restored following construction by the Contractor.</p> <p>The Contractor will erect signage every 50 feet along the edge of the avoidance area with the following information: "This area is habitat of the valley elderberry longhorn beetle, a federally threatened species, and must not be disturbed. This species is protected by the Federal ESA of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment." The signs should be clearly readable from a distance of 20 feet, and must be maintained by the Contractor for the duration of ground-disturbing activities.</p> <p>To prevent encroachment, these buffer areas must continue to be protected per USFWS protocol (after ground-disturbing activities) from adverse effects of the project during the construction phase. The Contractor will include protective measures such as fencing, signage, weeding, and trash removal to enforce the protection of the valley elderberry longhorn beetle and its associated habitat. The Contractor's biologist will submit a memorandum to the Mitigation Manager documenting compliance on a weekly basis or at other appropriate intervals. <i>Rev1</i></p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X	X			<p>Prior to ground-disturbing activities, during ground-disturbing activities, and after ground-disturbing activities.</p> <p>Follow reporting requirements as established by regulatory compliance permits.</p>	Condition of Design/Build Contract
<p>Bio#6: Construction of the HST alternatives would disturb California tiger salamander habitat.</p>	<p>Bio-MM#3: Prepare and Implement a Worker Environmental Awareness Program. See description above Impact Bio # 3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X	X			<p>Training of all crew/construction personnel prior to start of construction. Provide weekly/monthly reporting as required by permit conditions.</p>	Condition of Design/Build Contract
	<p>Bio-MM#4: Prepare and Implement a Weed Control Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds.</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X	X			<p>Prior to construction/monthly memorandum to document the progress of the Weed Control Plan and implementation</p>	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	Bio-MM#6: Prepare and Implement a Restoration and Revegetation Plan. See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X	X		Prior to construction. Follow reporting requirements as established by agency permit conditions.	Condition of Design/Build Contract. Restoration and Revegetation Plan (RRP) for upland communities and Compliance reports to document implementation and performance standards
	Bio-MM#7: Delineate Environmentally Sensitive Areas and Environmentally Restricted Areas (on plans and in-field). See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction/Post construction. Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract
	Bio-MM#8: Equipment Staging Areas. See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract
	Bio-MM#9: Mono-Filament Netting. During ground-disturbing activities, the Contractor biologist will verify that plastic mono-filament netting (erosion-control matting) or similar material is not used in erosion control materials; substitutes include coconut hair matting or tackified hydroseeding compounds. The Contractor's biologist will submit memoranda to the Authority documenting compliance monthly, or as appropriate, through the life of the project construction.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>		X			During ground-disturbing activities and Construction. Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract
	Bio-MM#10: Vehicle Traffic. See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Report on weekly basis.	Condition of Design/Build Contract
	Bio-MM#11: Entrapment Prevention. See description above in Impact Bio#5: Construction of the HST would disturb suitable habitat that has potential to support the valley elderberry longhorn beetle.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Report on weekly basis.	Condition of Design/Build Contract
	Bio-MM#12: Work Stoppage. See description above in Impact Bio #4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Submit a memorandum to the Mitigation Manager documenting compliance within 1 day of the work stoppage and subsequent action.	Condition of Design/Build Contract
	Bio-MM#13: 'Take' Notification and Reporting. See description above in Impact Bio #3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Following incident, immediately report to USFWS and/or CDFW. Prepare report and document in	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
							weekly/monthly report.	
	Bio-MM#14: Post-Construction Compliance Reports. See description above in Impact Bio #3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Authority Each Contractor will submit a Post-Construction Compliance Report at substantial contract completion for its own scope of work. The Authority will aggregate all reports and continue post-construction compliance reporting as required. <i>Rev1</i>			X		Post-construction. Follow reporting requirements as established by regulatory compliance permits.	Condition of Design/Build Contract
	See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>			X		Post-construction. Follow reporting requirements as established by regulatory compliance permits.	Condition of Design/Build Contract Habitat Mitigation and Monitoring Plan (HMMP) 1600 Streambed Alteration Agreement.
	Bio-MM#19: Conduct Pre-Construction Sampling and Assessment for Vernal Pool Fauna. See description above Impact Bio # 3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X	X		Prior to ground-disturbing activities Follow reporting requirements as established by regulatory compliance permits.	Condition of Design/Build Contract Plan for monitoring, salvage, relocation, and propagation of special-status plant species and Memorandum documenting compliance
	Bio-MM#20: Seasonal Vernal Pool Work Restriction. See description above in Impact Bio #4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Pre-construction and during construction. Seasonal restrictions: October 15 to June 1 (corresponding to the rainy season), or as determined through informal or formal consultation with the USFWS or USACE. Report within 1 month of completing the field work	Condition of Design/Build Contract
	Bio-MM#21: Implement and Monitor Vernal Pool Protection. See description above in Impact Bio #5: Construction of the HST would disturb suitable habitat that has potential to support the valley elderberry longhorn beetle.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor If offsite mitigation is required, the Authority will be responsible for implementation, monitoring and reporting. <i>Rev1</i>	X	X	X		Prior to construction/Post Construction monitoring and reporting as determined by regulatory agency permit conditions.	Condition of Design/Build Contract
	Bio-MM#23: Translocation of California Tiger Salamanders. Prior to ground-disturbing activities, the Contractor's biologist or designee will conduct a pre-construction survey and relocate any California tiger salamanders from within the construction footprint in accordance with the <i>Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander</i> (USFWS 2003). The relocation will	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Pre-construction surveys. Prior to ground-disturbing activities. Follow reporting as determined by regulatory permit conditions.	Condition of Design/Build Contract Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing					Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations			
	occur for any individuals within the construction footprint per coordination with the USFWS. The Contractor's biologist will conduct pit trapping. The Contractor's Biologist will work in coordination with the Contractor's biologist when installing amphibian exclusion fencing specified in Bio-MM#24. The Contractor's biologist will submit a memorandum to the Mitigation Manager documenting compliance on a weekly basis or at other appropriate intervals.								Salamander
	Bio-MM#24: Erect Amphibian Exclusion Fencing. The Contractor will install exclusion barriers (i.e., silt fences) to influence the movement of California tiger salamander, including other amphibian species, within impacted areas. They can be used to both exclude California tiger salamander, including other amphibian species, from ground-disturbing areas as well as to guide breeding adults toward pre-identified mitigation ponds. Exclusion fencing will be maintained by the Contractor throughout the California tiger salamander's entire active period (November to April) or until all ground-disturbing activities are completed, whichever occurs first. Exclusion fencing must be trenched into the soil at least 4 inches in depth with the soil compacted against both sides of the fence for its entire length to prevent amphibians from passing under the fence. Barriers must be inspected by the Contractor at least twice weekly on non-consecutive days and after any significant rain event (defined as a 0.75 inch downpour or 1.5 inches of rain in any 24-hour period). Barriers will be installed by the Contractor with turn-arounds at any access openings needed in the fencing, in order to redirect amphibians away from openings. The Contractor's biologist will submit a memorandum to the Authority documenting compliance. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Pre-construction. Prior to ground-disturbing activities. Follow reporting as determined by regulatory permit conditions.	Condition of Design/Build Contract	
	Bio-MM#44: Restore Temporary Impacts on Jurisdictional Waters. See description above in Impact Bio #4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>		X	X		Construction and Post-construction Follow reporting as determined by regulatory agency permit conditions.	Condition of Design/Build Contract	
	Bio-MM#45: Monitor Construction Activities within Jurisdictional Waters. See description above in Impact Bio #4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>		X	X		During ground-disturbing activities and Construction Follow reporting as determined by regulatory agency permit conditions.	Condition of Design/Build Contract	

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
Bio#7: Construction of the HST alternatives would disturb western spadefoot toad habitat.	Bio-MM#3: Prepare and Implement a Worker Environmental Awareness Program. See description above in Impact Bio #3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Training of all crew/construction personnel prior to start of construction. Provide weekly/monthly reporting as required by permit conditions.	Condition of Design/Build Contract
	Bio-MM#4: Prepare and Implement a Weed Control Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction/monthly memorandum to document the progress of the Weed Control Plan and implementation	Condition of Design/Build Contract
	Bio-MM#5: Prepare and Implement a Biological Resources Management Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Following implementation and reporting schedule as established by agency permit conditions.	Condition of Design/Build Contract. Biological Resources Management Plan (BRMP) and Construction plans
	Bio-MM#6: Prepare and Implement a Restoration and Revegetation Plan. See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X	X		Prior to construction. Follow reporting requirements as established by agency permit conditions.	Condition of Design/Build Contract. Restoration and Revegetation Plan (RRP) for upland communities and Compliance reports to document implementation and performance standards
	Bio-MM#7: Delineate Environmentally Sensitive Areas and Environmentally Restricted Areas (on plans and in-field). See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction/Post construction. Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract
	Bio-MM#8: Equipment Staging Areas. See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract
	Bio-MM#9: Mono-Filament Netting. See description above in Impact Bio #6: Construction of the HST would disturb California tiger salamander habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>		X			During ground-disturbing activities and Construction. Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract
	Bio-MM#10: Vehicle Traffic. See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Report on weekly basis.	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	Bio-MM#11: Entrapment Prevention. See description above in Impact Bio #5: Construction of the HST would disturb suitable habitat that has potential to support the valley elderberry longhorn beetle.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Report on weekly basis.	Condition of Design/Build Contract
	Bio-MM#12: Work Stoppage. See description above in Impact Bio#4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Submit a memorandum to the Mitigation Manager documenting compliance within 1 day of the work stoppage and subsequent action.	Condition of Design/Build Contract
	Bio-MM#13: 'Take' Notification and Reporting. See description above in Impact Bio #5: Construction of the HST would disturb suitable habitat that has potential to support the valley elderberry longhorn beetle.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Following incident, immediately report to USFWS and/or CDFW. Prepare report and document in weekly/monthly report.	Condition of Design/Build Contract
	Bio-MM#14: Post-Construction Compliance Reports. See description above in Impact Bio # 3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor and Authority Each Contractor will submit a Post-Construction Compliance Report at substantial contract completion for its own scope of work. The Authority will aggregate all reports and continue post-construction compliance reporting as required. <i>Rev1</i>			X		Post-construction. Follow reporting requirements as established by regulatory compliance permits.	Condition of Design/Build Contract
	Bio-MM#15: Restore Temporary Riparian Impacts. See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>			X		Post-construction. Follow reporting requirements as established by regulatory compliance permits.	Condition of Design/Build Contract Habitat Mitigation and Monitoring Plan (HMMP) 1600 Streambed Alteration Agreement.
	Bio-MM#19: Conduct Pre-Construction Sampling and Assessment for Vernal Pool Fauna. See description above in Impact Bio #4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X	X		Prior to ground-disturbing activities Follow reporting requirements as established by regulatory compliance permits.	
	Bio-MM#20: Seasonal Vernal Pool Work Restriction. Impact Bio #4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Pre-construction and during construction. Seasonal restrictions: October 15 to June 1 (corresponding to the rainy season), or as determined through informal or formal consultation with the	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
							USFWS or USACE. Report within 1 month of completing the field work	
	Bio-MM#21: Implement and Monitor Vernal Pool Protection. See description above in Impact Bio #4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods	Implementing Party: Contractor Monitoring/Reporting Party: Contractor If offsite mitigation is required, the Authority will be responsible for implementation, monitoring, and reporting. <i>Rev1</i>	X	X	X		Prior to construction/Post Construction monitoring and reporting as determined by regulatory agency permit conditions.	Condition of Design/Build Contract
	See description above in Impact Bio #5: Construction of the HST would disturb suitable habitat that has potential to support the valley elderberry longhorn beetle.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X				
	Bio-MM#24: Erect Amphibian Exclusion Fencing. See description above in Impact Bio#6: Construction of the HST alternatives would disturb California tiger salamander habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Pre-construction surveys. Prior to ground-disturbing activities. Follow reporting as determined by regulatory permit conditions.	Condition of Design/Build Contract Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander
	Bio-MM#25: Conduct Emergence and Larval Surveys for Western Spadefoot Toad. The Contractor's biologist or designee (qualified herpetologist) will conduct pre-construction emergence and larval surveys for western spadefoot toad during the fall and winter rainy season. Emergence surveys will be conducted within the appropriate time period(s) after precipitation events as evaluated by a qualified herpetologist and will be partially in tandem with California tiger salamander surveys. Potential breeding depressions, including vernal pools, will be surveyed for western spadefoot toad larvae concurrently with special-status vernal pool branchiopod and California tiger salamander pre-construction surveys. Adults found within the construction footprint during emergence surveys will be relocated to an appropriate area adjacent to another pool suitable for breeding. Pre-construction surveys will help identify the proper implementation of mitigation measures, identify state and federal permit requirements, and inform the accurate implementation of mitigation requirements. The Contractor's biologist will submit a memorandum to the Authority documenting compliance after surveys are complete. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Pre-construction surveys. Prior to ground-disturbing activities. Follow reporting as determined by regulatory permit conditions.	Condition of Design/Build Contract
	Bio-MM#44: Restore Temporary Impacts on Jurisdictional Waters. See description above in Impact Bio #4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>		X	X		Construction and Post-construction Follow reporting as determined by regulatory agency permit conditions.	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	Bio-MM#45: Monitor Construction Activities within Jurisdictional Waters. See description above in Impact Bio #4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>		X	X		During ground-disturbing activities and Construction Follow reporting as determined by regulatory agency permit conditions.	Condition of Design/Build Contract
	Bio-MM#46: Install Wildlife Fencing. Prior to operation of the HST, the Contractor will install free-ranging mammal-proof fencing along portions of the proposed project consistent with final design. The Contractor will verify that the installation is consistent with the designated terms and conditions in the applicable permits. The Contractor will prepare and submit a memorandum to the Authority documenting compliance. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>			X		Prior to operation of the HST	Submit a memorandum documenting compliance.
Bio#8: Construction of the HST alternatives would disturb habitat that supports the western pond turtle.	Bio-MM#3: Prepare and Implement a Worker Environmental Awareness Program. See description above in Impact Bio #3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Training of all crew/construction personnel prior to start of construction. Provide weekly/monthly reporting as required by permit conditions.	Condition of Design/Build Contract
	Bio-MM#5: Prepare and Implement a Biological Resources Management Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Following implementation and reporting schedule as established by agency permit conditions.	Condition of Design/Build Contract. Biological Resources Management Plan (BRMP) and Construction plans
	Bio-MM#6: Prepare and Implement a Restoration and Revegetation Plan. See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X	X		Prior to construction. Follow reporting requirements as established by agency permit conditions.	Condition of Design/Build Contract. Restoration and Revegetation Plan (RRP) for upland communities and Compliance reports to document implementation and performance standards
	Bio-MM#7: Delineate Environmentally Sensitive Areas and Environmentally Restricted Areas (on plans and in-field). See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction/Post construction. Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract
	Bio-MM#8: Equipment Staging Areas. See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract
	Bio-MM#9: Mono-Filament Netting. See description above in Impact Bio #6: Construction of the HST would disturb California tiger salamander habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>		X			During ground-disturbing activities and Construction. Follow reporting requirements as established by agency	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
							permit conditions	
	Bio-MM#10: Vehicle Traffic. See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Report on weekly basis.	Condition of Design/Build Contract
	Bio-MM#12: Work Stoppage. See description above in Impact Bio #4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Submit a memorandum to the Mitigation Manager documenting compliance within 1 day of the work stoppage and subsequent action.	Condition of Design/Build Contract
	Bio-MM#13: 'Take' Notification and Reporting. See description above in Impact Bio #5: Construction of the HST would disturb suitable habitat that has potential to support the valley elderberry longhorn beetle.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Following incident, immediately report to USFWS and/or CDFW. Prepare report and document in weekly/monthly report.	Condition of Design/Build Contract
	Bio-MM#14: Post-Construction Compliance Reports. See description above in Impact Bio # 3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>			X		Post-construction. Follow reporting requirements as established by regulatory compliance permits.	Condition of Design/Build Contract
	Bio-MM#15: Restore Temporary Riparian Impacts. See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>			X		Post-construction. Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract Habitat Mitigation and Monitoring Plan (HMMP) and Memorandum documenting compliance and other reporting requirements in the 1600 Streambed Alteration Agreement.
	Bio-MM#26: Conduct Western Pond Turtle Pre-Construction Surveys and Relocation. Prior to ground-disturbing activities, conduct pre-construction surveys for western pond turtles to determine the presence or absence of western pond turtles within the construction footprint. If western pond turtles are found within the construction footprint, conduct daily clearance surveys prior to the initiation of any construction activities. If a western pond turtle nest will be affected by ground-disturbing activities, relocate the eggs according to relocation protocol coordinated with CDFW for all life stages of western pond turtles. Relocate hatchling and adult turtles outside of the construction footprint in suitable habitat. The Contractor's biologist will submit a memorandum to the Authority documenting compliance. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Pre-construction surveys. Prior to ground-disturbing activities. Clearance surveys during construction. Follow reporting as determined by regulatory permit conditions.	Condition of Design/Build Contract
	Bio-MM#27: Conduct Western Pond Turtle Monitoring. During ground-disturbing activities, the Contractor's biologist will observe all construction activities within habitat that supports populations of western pond turtles. If ESAs are deemed necessary, the Contractor's biologist will conduct a clearance survey for western pond turtles prior to the time the fence is installed. If	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>		X			During ground-disturbing activities and Daily clearance surveys during construction. Follow reporting as determined	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	necessary, conduct daily clearance surveys prior to construction. The Contractor's biologist will submit a memorandum to the Authority documenting compliance.						by regulatory permit conditions.	
	Bio-MM#28: Implement Western Pond Turtle Avoidance and Relocation. Prior to ground-disturbing activities, if a western pond turtle nesting area is present and will be affected by ground-disturbing activities as determined by the Contractor's biologist. The Contractor will avoid western pond turtle nesting areas. If avoidance is not feasible, as determined by the Authority Contractor's biologist will coordinate with CDFW to identify where to relocate western pond turtles. The Contractor's biologist will coordinate specific trapping and relocation protocols with CDFW for adults, hatchlings, and eggs prior to ground-disturbing activities. The Contractor will not move eggs or hatchlings without prior coordination with the Contractor's biologist and concurrence from CDFW. The Contractor's biologist will submit a memorandum to the Authority documenting compliance on a weekly basis or as determined appropriate pending construction progress. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to ground-disturbing activities and during ground-disturbing activities and construction. Follow reporting as determined by regulatory permit conditions.	Condition of Design/Build Contract
	Bio-MM#44: Restore Temporary Impacts on Jurisdictional Waters. See description above in Impact Bio #4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>		X	X		Construction and Post-construction Follow reporting as determined by regulatory agency permit conditions.	Condition of Design/Build Contract
	Bio-MM#45: Monitor Construction Activities within Jurisdictional Waters. See description above in Impact Bio #4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>		X	X		During ground-disturbing activities and Construction Follow reporting as determined by regulatory agency permit conditions.	Condition of Design/Build Contract
	Bio-MM#53: Implement Western Pond Turtle Mitigation Measures. The Contractor will mitigate the impacts on western pond turtle in accordance with the USFWS Biological Opinion and /or CDFW 2081(b). The Contractor will submit a memorandum documenting compliance to the Authority. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X	X			Memorandum documenting compliance with BO and 2081 Determination
Bio#10: Construction of the HST alternatives would disturb nesting Swainson's hawk.	Bio-MM#3: Prepare and Implement a Worker Environmental Awareness Program. See description above in Impact Bio #3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Training of all crew/construction personnel prior to start of construction. Provide weekly/monthly reporting as required by permit conditions.	Condition of Design/Build Contract
	Bio-MM#5: Prepare and Implement a Biological Resources Management Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Following implementation and reporting schedule as established by agency permit conditions.	Condition of Design/Build Contract. Biological Resources Management Plan (BRMP) and Construction plans
	Bio-MM#7: Delineate Environmentally Sensitive Areas and Environmentally Restricted Areas (on plans and in-field). See description above in Impact Bio #2: Construction of the HST would disturb	Implementing Party: Contractor Monitoring/Reporting Party: Contractor	X	X			Prior to construction/Post construction. Follow reporting requirements as	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	Great Valley mixed riparian forest and other riparian habitat.	<i>Rev1</i>					established by agency permit conditions	
	Bio-MM#8: Equipment Staging Areas. See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract
	Bio-MM#10: Vehicle Traffic. See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Report on weekly basis.	Condition of Design/Build Contract
	Bio-MM#12: Work Stoppage. See description above in Impact Bio #4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Submit a memorandum to the Mitigation Manager documenting compliance within 1 day of the work stoppage and subsequent action.	Condition of Design/Build Contract
	Bio-MM#13: 'Take' Notification and Reporting. See description above in Impact Bio #5: Construction of the HST would disturb suitable habitat that has potential to support valley elderberry longhorn beetle.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Following incident, immediately report to USFWS and/or CDFW. Prepare report and document in weekly/monthly report.	Condition of Design/Build Contract
	Bio-MM#14: Post-Construction Compliance Reports. See description above in Impact Bio #4: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i> Contractor's biologist			X		Post-construction. Follow reporting requirements as established by regulatory compliance permits.	Condition of Design/Build Contract
	Bio-MM#29: Conduct Pre-Construction Surveys and Monitoring for Raptors. Prior to ground-disturbing activities, the Contractor's biologist will conduct pre-construction surveys for nesting raptors if construction and habitat removal activities are scheduled to occur during the breeding season (February 1 to August 15). The Contractor's biologist will conduct surveys in areas within 300 feet of the construction footprint. Modify the required survey dates based on local conditions. If breeding raptors with active nests are found, establish a 300-foot buffer around the nest and phase construction activities within the buffer(s) until the young have fledged from the nest or the nest is abandoned. Approve construction activities within the buffer area, pending site conditions that will not jeopardize the nest. The Contractor's biologist will conduct pre-construction surveys for bald and golden eagle nests within ¼ mile of the construction footprint. If nesting bald or golden eagles are identified, the Contractor's Biologist in coordination with the Contractor's biologist will establish a 1,000-foot buffer area. Contractor's biologist will adjust the 1,000-foot buffer as needed to reflect existing conditions including ambient noise, topography, and disturbance with the approval of the USFWS or CDFW, as appropriate. The Contractor's biologist will	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Pre-construction surveys, prior to ground-disturbing activities, and during construction	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	conduct regular monitoring of the nest to determine success/failure and to confirm that project activities are not conducted within the buffer(s) until the nesting cycle is complete or the nest fails. The Contractor's biologist will document the results of the surveys and the ongoing monitoring, and provide a copy of the monitoring reports for impact areas to the respective agencies. The Contractor's biologist will approve ground-disturbing activities within the buffer area, pending site conditions that will not jeopardize the nest. Contractor's biologist will submit a memorandum to the Authority documenting compliance.							
	Bio-MM#31: Raptor Protection on Power Lines. During final design, the Contractor will verify that the catenary system and masts are designed to be raptor-safe, in accordance with <i>the Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006</i> (Avian Power Line Interaction Committee 2006). The Contractor's biologist will check the final design drawings and submit a memorandum to the Authority documenting compliance <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Final design, completed prior to construction.	Condition of Design/Build Contract
	Bio-MM#32: Conduct Pre-Construction Surveys for Swainson's Hawks. The Contractor's biologist will conduct pre-construction surveys for Swainson's hawks during the nesting season (March 1 through September 15) within the construction footprint and within a 0.5-mile buffer. The Contractor's biologist will conduct the pre-construction nest surveys at least 30 days prior to ground-disturbing activities and phase with project construction. The pre-construction surveys will determine the status (i.e., active, inactive) of the nest and then will be used to set up nest avoidance strategies (Bio-MM#33). The Contractor's biologist will submit a memorandum to the Authority documenting compliance with the measure. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Pre-construction surveys at least 30 days prior to ground-disturbing activities and construction	Condition of Design/Build Contract
	Bio-MM#33: Swainson's Hawk Nest Avoidance. If active Swainson's hawk nests (defined as a nest used one or more times in the last 5 years) are found within 0.5 mile of the construction footprint during the nesting season (March 1 to September 15), the Contractor' will implement buffers restricting construction activities, following CDFW's <i>Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (Buteo swainsoni) in the Central Valley of California</i> (CDFW 1994). Adjustments to the buffer(s) will require prior approval by CDFW as coordinated by the Contractor's biologist. The buffers and nest condition will then be monitored (see Bio-MM#34). The Contractor's biologist will submit a memorandum to the Authority documenting compliance on a weekly basis.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Nesting season (March 1 – September 15)	Condition of Design/Build Contract
	Bio-MM#34: Monitor Removal of Nest Trees for Swainson's Hawks. Prior to ground-disturbing activities, the Contractor's biologist will monitor nest trees for Swainson's hawks in the construction footprint that are not removed. If a nest tree for a Swainson's hawk must be removed, the Contractor will obtain a Management Authorization (including conditions to offset the loss of the nest tree) from the CDFW, as described in CDFW's Staff Reporting Regarding Mitigation for Impacts to Swainson's Hawks (Buteo swainsoni) in the Central Valley of California (CDFW 1994). The Management Authorization will specify the tree removal period, generally between October 1 and February 1. If ground-disturbing activities or other project-related activities may cause nest abandonment by a Swainson's hawk or forced fledging within the specified	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to ground-disturbing activities, during construction.	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	buffer area, monitoring of the nest site (funded by the Authority) by the Contractor's biologist will be required to determine if the nest is abandoned. The Contractor's biologist will submit a memorandum to the Authority documenting compliance on a weekly basis during the appropriate season.							
Bio#11: Construction of the HST alternatives would disturb breeding birds, including raptors.	Bio-MM#3: Prepare and Implement a Worker Environmental Awareness Program. See description above in Impact Bio # 3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor	X	X			Training of all crew/construction personnel prior to start of construction. Provide weekly/monthly reporting as required by permit conditions.	Condition of Design/Build Contract
	Bio-MM#5: Prepare and Implement a Biological Resources Management Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Following implementation and reporting schedule as established by agency permit conditions.	Condition of Design/Build Contract. Biological Resources Management Plan (BRMP) and Construction plans
	Bio-MM#7: Delineate Environmentally Sensitive Areas and Environmentally Restricted Areas (on plans and in-field). See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction/Post construction. Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract
	Bio-MM#8: Equipment Staging Areas. See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract
	Bio-MM#10: Vehicle Traffic. See description above in Impact Bio #2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Report on weekly basis.	Condition of Design/Build Contract
	Bio-MM#12: Work Stoppage. See description above in Impact t Bio #4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Submit a memorandum to the Mitigation Manager documenting compliance within 1 day of the work stoppage and subsequent action.	Condition of Design/Build Contract
	Bio-MM#13: 'Take' Notification and Reporting. See description above in Impact Bio #5: Construction of the HST would disturb suitable habitat that has potential to support the valley elderberry longhorn beetle.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Following incident, immediately report to USFWS and/or CDFW. Prepare report and document in weekly/monthly report.	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	Bio-MM#14: Post-Construction Compliance Reports. See description above in Impact Bio #3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor and Authority Each Contractor will submit a Post-Construction Compliance Report at substantial contract completion for its own scope of work. The Authority will aggregate all reports and continue post-construction compliance reporting as required. <i>Rev1</i>			X		Post-construction. Follow reporting requirements as established by regulatory compliance permits.	Condition of Design/Build Contract
	Bio-MM#29: Conduct Pre-Construction Surveys and Monitoring for Raptors. See description above in Impact Bio #10: Construction of the HST would disturb nesting Swainson's hawk.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Pre-construction surveys, prior to ground-disturbing activities, and during construction	Condition of Design/Build Contract
	Bio-MM#30: Conduct Pre-Construction Surveys and Delineate Active Nest Exclusion Areas For Other Breeding Birds. In the event active bird nests are encountered during the pre-construction survey, the Contractor will determine the nest avoidance buffer zones as appropriate. The Contractor will establish the suitable buffers consistent with the intent of the MBTA. The Contractor will delineate nest avoidance buffers established for ground nesting birds in a manner that does not create predatory bird perch points in close proximity (150 feet) to the active nest site. The Contractor will monitor active bird nests weekly or more frequently pending status of nest and status of fledgling development. The Contractor will maintain the nest avoidance buffer zone until nestlings have fledged or the nest is abandoned. The Contractor will submit a memorandum to the Authority documenting compliance. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Pre-construction surveys and during construction	Condition of Design/Build Contract
	Bio-MM#31: Raptor Protection on Power Lines. See description above in Impact Bio#10: Construction of the HST would disturb nesting Swainson's hawk.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Final design, completed prior to construction.	Condition of Design/Build Contract
Bio#12: Construction of the HST alternatives would disturb or cause the loss of burrowing owls and their habitat.	Bio-MM#3: Prepare and Implement a Worker Environmental Awareness Program. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Training of all crew/construction personnel prior to start of construction. Provide weekly/monthly reporting as required by permit conditions.	Condition of Design/Build Contract
	Bio-MM#5: Prepare and Implement a Biological Resources Management Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Following implementation and reporting schedule as established by agency permit conditions.	Condition of Design/Build Contract. Biological Resources Management Plan (BRMP) and Construction plans
	Bio-MM#7: Delineate Environmentally Sensitive Areas and Environmentally Restricted Areas (on plans and in-field). See description above in Impact Bio#2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction/Post construction. Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	Bio-MM#8: Equipment Staging Areas. See description above in Impact Bio#2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract
	Bio-MM#10: Vehicle Traffic. See description above in Impact Bio#2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Report on weekly basis.	Condition of Design/Build Contract
	Bio-MM#13: 'Take' Notification and Reporting. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Following incident, immediately report to USFWS and/or CDFW. Prepare report and document in weekly/monthly report. CDFW	Condition of Design/Build Contract
	Bio-MM#14: Post-Construction Compliance Reports. See description above in Impact Bio#5: Construction of the HST would disturb suitable habitat that has potential to support the valley elderberry longhorn beetle.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor and Authority Each Contractor will submit a Post-Construction Compliance Report at substantial contract completion for its own scope of work. The Authority will aggregate all reports and continue post-construction compliance reporting as required. <i>Rev1</i>			X		Post-construction. Follow reporting requirements as established by regulatory compliance permits.	Condition of Design/Build Contract
	Bio-MM#35: Conduct Pre-Construction Surveys for Burrowing Owls. Prior to ground-disturbing activities, the Contractor will conduct pre-construction surveys in accordance with CDFW's <i>Staff Report on Burrowing Owl Mitigation</i> (CDFW 1995). The Contractor will conduct these surveys at appropriate timeframes within suitable habitat located in the construction footprint and a 500-foot buffer. Results of the surveys will be used to inform Bio-MM#36. The Contractor will submit a memorandum to the Authority documenting compliance on a weekly basis. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to ground-disturbing activities, the winter (December 1 through January 31) and breeding season (April 15 through July 15)	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	<p>Bio-MM#36: Burrowing Owl Avoidance and Minimization. Implement burrowing owl avoidance and minimization measures following CDFW's <i>Staff Report on Burrowing Owl Mitigation</i> (CDFW 1995).</p> <ul style="list-style-type: none"> The Contractor will not disturb occupied burrowing owl burrows during the nesting season (February 1 through August 31) unless it is verified that either the birds have not begun egg-laying and incubation, or that juveniles from the occupied burrows are foraging independently and are capable of independent survival as determined by the Contractor. Eviction outside the nesting season may be permitted pending evaluation of eviction plans and receipt of formal written approval from the CDFW authorizing the eviction. Unless otherwise authorized by CDFW, the Contractor will establish a 250-foot buffer (as an environmentally sensitive area) between the construction work area and nesting burrowing owls during the nesting season. The Contractor will maintain this protected area until August 31 or a time set at CDFW's discretion and based upon monitoring evidence, until the young owls are foraging independently. Unless otherwise authorized by CDFW, the Contractor will establish a 160-foot buffer (as an environmentally sensitive area) between the construction work area and occupied burrows during the non-breeding season (September 1 through January 31). The Contractor will maintain this protected area until January 31 or at CDFW's discretion and based upon monitoring evidence, until the young owls are foraging independently. <p>If burrowing owls must be moved away from the construction footprint, the Contractor will undertake the passive relocation measures in accordance with CDFW's (1995) guidelines. The Contractor will submit a memorandum to the Authority documenting compliance on a weekly basis.</p> <p><i>Rev1</i></p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X	X			Preconstruction burrow identification, during construction.	Condition of Design/Build Contract
Bio#13: Construction of the HST alternatives would disturb breeding or nonbreeding bats.	<p>Bio-MM#3: Prepare and Implement a Worker Environmental Awareness Program. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X	X			Training of all crew/construction personnel prior to start of construction. Provide weekly/monthly reporting as required by permit conditions.	Condition of Design/Build Contract
	<p>Bio-MM#5: Prepare and Implement a Biological Resources Management Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds.</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X				Following implementation and reporting schedule as established by agency permit conditions.	Condition of Design/Build Contract. Biological Resources Management Plan (BRMP) and Construction plans
	<p>Bio-MM#7: Delineate Environmentally Sensitive Areas and Environmentally Restricted Areas (on plans and in-field). See description above in Impact Bio#2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X	X			Prior to construction/Post construction. Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	Bio-MM#8: Equipment Staging Areas. See description above in Impact Bio#2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract
	Bio-MM#10: Vehicle Traffic. See description above in Impact Bio#2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Report on weekly basis.	Condition of Design/Build Contract
	Bio-MM#12: Work Stoppage. See description above in Impact Bio#4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Submit a memorandum to the Mitigation Manager documenting compliance within 1 day of the work stoppage and subsequent action.	Condition of Design/Build Contract
	Bio-MM#13: 'Take' Notification and Reporting. See description above in Impact Bio#5: Construction of the HST would disturb suitable habitat that has potential to support the valley elderberry longhorn beetle.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Following incident, immediately report to USFWS and/or CDFW. Prepare report and document in weekly/monthly report. CDFW	Condition of Design/Build Contract
	Bio-MM#14: Post-Construction Compliance Reports. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor and Authority Each Contractor will submit a Post-Construction Compliance Report at substantial contract completion for its own scope of work. The Authority will aggregate all reports and continue post-construction compliance reporting as required. <i>Rev1</i>			X		Post-construction. Follow reporting requirements as established by regulatory compliance permits.	Condition of Design/Build Contract
	Bio-MM#37: Conduct Pre-Construction Surveys for Special-Status Bat Species. Prior to any ground-disturbing activities, the Contractor will conduct a visual and acoustic pre-construction survey for roosting bats. Include a minimum of one day and one evening in the visual pre-construction survey. The Contractor will contact CDFW if any hibernation roosts or active nurseries are identified within the construction footprint, as appropriate. The Contractor will submit a memorandum to the Authority documenting compliance. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X	X		Pre-construction surveys, prior to ground-disturbing activities	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	<p>Bio-MM#38: Bat Avoidance and Relocation. During ground-disturbing activities, the Contractor will avoid active hibernation roosts. If avoidance of the hibernation roost is not feasible, the Contractor will prepare a relocation plan and coordinate the construction of an alternative bat roost with CDFW. The Contractor will implement the Bat Roost Relocation Plan prior to the commencement of construction activities.</p> <p>Remove roosts with approval from CDFW before hibernation begins (October 31), or after young are flying (July 31), using exclusion and deterrence techniques described in Bio-MM#39 below. The timeline to remove vacated roosts is between August 1 and October 31. All effort to avoid disturbance to maternity roosts will be made during construction activities. The Contractor will submit a memorandum to the Authority documenting compliance.</p> <p><i>Rev1</i></p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X	X	X		Ground-disturbing activities	Condition of Design/Build Contract
	<p>Bio-MM#39: Bat Exclusion and Deterrence. During ground-disturbing activities, if non-breeding or non-hibernating individuals or groups of bats are found within the construction footprint, the bats will be safely excluded by either opening the roosting area to change lighting and airflow conditions, or by installing one-way doors, or other appropriate methods specified by CDFW. The Contractor will leave the roost undisturbed by project-related activities for a minimum of one week after implementing exclusion and/or eviction activities. The Contractor will not implement exclusion measures to evict bats from established maternity roosts or occupied hibernation roosts. The Contractor will submit a memorandum to the Authority documenting compliance.</p> <p><i>Rev1</i></p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X	X	X		During ground-disturbing activities	Condition of Design/Build Contract
Bio#14: Construction of the HST alternatives would disturb American badger dens.	<p>Bio-MM#3: Prepare and Implement a Worker Environmental Awareness Program. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X	X			Training of all crew/construction personnel prior to start of construction. Provide weekly/monthly reporting as required by permit conditions.	Condition of Design/Build Contract
	<p>Bio-MM#5: Prepare and Implement a Biological Resources Management Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds.</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X				Following implementation and reporting schedule as established by agency permit conditions.	Condition of Design/Build Contract. Biological Resources Management Plan (BRMP) and Construction plans
	<p>Bio-MM#6: Prepare and Implement a Restoration and Revegetation Plan. See description above in Impact Bio#2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X	X	X		Prior to construction. Follow reporting requirements as established by agency permit conditions.	Condition of Design/Build Contract. Restoration and Revegetation Plan (RRP) for upland communities and Compliance reports to document implementation and performance standards
	<p>Bio-MM#7: Delineate Environmentally Sensitive Areas and Environmentally Restricted Areas (on plans and in-field). See description above in Impact Bio#2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X	X			Prior to construction/Post construction. Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	Bio-MM#8: Equipment Staging Areas. See description above in Impact Bio#2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract
	Bio-MM#10: Vehicle Traffic. See description above in Impact Bio#2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Report on weekly basis.	Condition of Design/Build Contract
	Bio-MM#11: Entrapment Prevention. See description above in Impact Bio#5: Construction of the HST would disturb suitable habitat that has potential to support the valley elderberry longhorn beetle.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Report on weekly basis.	Condition of Design/Build Contract
	Bio-MM#12: Work Stoppage. See description above in Impact Bio#4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Submit a memorandum to the Mitigation Manager documenting compliance within 1 day of the work stoppage and subsequent action.	Condition of Design/Build Contract
	Bio-MM#40: Conduct Pre-Construction Surveys for American Badger. Prior to ground-disturbing activities, the Contractor will conduct pre-construction surveys for American badger den sites within suitable habitats in the construction footprint. The Contractor will conduct these surveys no more than 30 days before the start of ground-disturbing activities and phase with project build out. The Contractor will submit a memorandum to the Authority documenting compliance. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to ground-disturbing activities	Condition of Design/Build Contract
	Bio-MM#41: American Badger Avoidance. The Contractor will establish a 50-foot buffer around occupied American badger dens. The Contractor will establish a 200-foot buffer around badger maternity dens through the pup-rearing season (February 15 through July 1). Adjustments to the buffer(s) will require prior approval by CDFW. The Contractor will submit a memorandum to the Authority documenting compliance. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction per approval by CDFW	Condition of Design/Build Contract
	Bio-MM#44: Restore Temporary Impacts on Jurisdictional Waters. See description above in Impact Bio#4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>		X	X		Construction and Post-construction Follow reporting as determined by regulatory agency permit conditions.	Condition of Design/Build Contract
	Bio-MM#45: Monitor Construction Activities within Jurisdictional Waters. See description above in Impact Bio#4: Construction of the HST would disturb	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>		X	X		During ground-disturbing activities and Construction Follow reporting as	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	suitable habitat that has potential to support vernal pool branchiopods. <i>Rev1</i>						determined by regulatory agency permit conditions.	
Bio#15: Construction of the HST alternatives would disturb San Joaquin kit fox dens.	Bio-MM#3: Prepare and Implement a Worker Environmental Awareness Program. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Training of all crew/construction personnel prior to start of construction. Provide weekly/monthly reporting as required by permit conditions.	Condition of Design/Build Contract
	Bio-MM#3: Prepare and Implement a Worker Environmental Awareness Program. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Training of all crew/construction personnel prior to start of construction. Provide weekly/monthly reporting as required by permit conditions.	Condition of Design/Build Contract
	Bio-MM#5: Prepare and Implement a Biological Resources Management Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Following implementation and reporting schedule as established by agency permit conditions.	Condition of Design/Build Contract. Biological Resources Management Plan (BRMP) and Construction plans
	Bio-MM#7: Delineate Environmentally Sensitive Areas and Environmentally Restricted Areas (on plans and in-field). See description above in Impact Bio#2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction/Post construction. Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract
	Bio-MM#8: Equipment Staging Areas. See description above in Impact Bio#2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract
	Bio-MM#10: Vehicle Traffic. See description above in Impact Bio#2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Report on weekly basis.	Condition of Design/Build Contract
	Bio-MM#11: Entrapment Prevention. See description above in Impact Bio#5: Construction of the HST would disturb suitable habitat that has potential to support the valley elderberry longhorn beetle.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Report on weekly basis.	Condition of Design/Build Contract
	Bio-MM#12: Work Stoppage. See description above in Impact Bio#5: Construction of the HST would disturb suitable habitat that has potential to support the valley elderberry longhorn beetle.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Submit a memorandum to the Mitigation Manager documenting compliance	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
							within 1 day of the work stoppage and subsequent action. CDFW	
	Bio-MM#13: 'Take' Notification and Reporting. See description above in Impact Bio#5: Construction of the HST would disturb suitable habitat that has potential to support the valley elderberry longhorn beetle.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Following incident, immediately report to USFWS and/or CDFW. Prepare report and document in weekly/monthly report.	Condition of Design/Build Contract
	Bio-MM#14: Post-Construction Compliance Reports. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor and Authority Each Contractor will submit a Post-Construction Compliance Report at substantial contract completion for its own scope of work. The Authority will aggregate all reports and continue post-construction compliance reporting as required. <i>Rev1</i>			X		Post-construction	Condition of Design/Build Contract
	Bio-MM#42: Conduct Pre-Construction Surveys for San Joaquin Kit Fox. The USFWS' <i>Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance</i> (USFWS 1999b) will be implemented as follows for construction related impacts. Prior to the start of ground-disturbing activities, the Contractor will conduct pre-construction surveys in accordance with the USFWS' <i>San Joaquin Kit Fox Survey Protocol for the Northern Range</i> (USFWS 1999c). The Contractor will submit a memorandum to the Authority documenting compliance. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Pre-construction surveys and prior to ground-disturbing activities	Condition of Design/Build Contract
	Bio-MM#43: Minimize Impacts on San Joaquin Kit Fox. The Contractor will Implement USFWS' <i>Standard Measures for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance</i> (USFWS 1999b) to minimize ground disturbance-related impacts on this species. The Contractor will submit a memorandum to the Authority documenting compliance. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Pre-construction surveys and prior to ground-disturbing activities	Condition of Design/Build Contract USFWS' Standard Measures for Protection of the San Joaquin Kit Fox
	Bio-MM#44: Restore Temporary Impacts on Jurisdictional Waters. See description above in Impact Bio#4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev</i>		X	X		Construction and Post-construction Follow reporting as determined by regulatory agency permit conditions.	Condition of Design/Build Contract
Bio#16: Construction of the HST alternatives would temporarily convert special-	Bio-MM#45: Monitor Construction Activities within Jurisdictional Waters. See description above in Impact Bio#4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>		X	X		During ground-disturbing activities and Construction Follow reporting as determined by regulatory agency permit conditions.	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
status plant communities (e.g., Great Valley mixed riparian forest, coastal and valley freshwater marsh, vernal pools).	Bio-MM#4: Prepare and Implement a Weed Control Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction/monthly memorandum to document the progress of the Weed Control Plan and implementation	Condition of Design/Build Contract
	Bio-MM#5: Prepare and Implement a Biological Resources Management Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Following implementation and reporting schedule as established by agency permit conditions.	Condition of Design/Build Contract. Biological Resources Management Plan (BRMP) and Construction plans
	Bio-MM#6: Prepare and Implement a Restoration and Revegetation Plan. See description above in Impact Bio#2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X	X		Prior to construction. Follow reporting requirements as established by agency permit conditions.	Condition of Design/Build Contract. Restoration and Revegetation Plan (RRP) for upland communities and Compliance reports to document implementation and performance standards
	Bio-MM#7: Delineate Environmentally Sensitive Areas and Environmentally Restricted Areas (on plans and in-field). See description above in Impact Bio#2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X	X		Prior to construction and Construction	Final construction plans (including grading and landscape plans) and Memorandum regarding the field delineation of all ESAs/ERAs
	Bio-MM#8: Equipment Staging Areas. See description above in Impact Bio#2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract
	Bio-MM#10: Vehicle Traffic. See description above in Impact Bio#2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Report on weekly basis.	Condition of Design/Build Contract
	Bio-MM#19: Conduct Pre-Construction Sampling and Assessment for Vernal Pool Fauna. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X	X		Prior to ground-disturbing activities Follow reporting requirements as established by regulatory compliance permits.	Condition of Design/Build Contract Plan for monitoring, salvage, relocation, and propagation of special-status plant species and Memorandum documenting compliance
	Bio-MM#20: Seasonal Vernal Pool Work Restriction. See description above in Impact Bio#4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Pre-construction and during construction. Seasonal restrictions: October 15 to June 1 (corresponding to the rainy season), or as determined through	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
							informal or formal consultation with the USFWS or USACE. Report within 1 month of completing the field work	
	Bio-MM#21: Implement and Monitor Vernal Pool Protection. See description above in Impact Bio#4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor If offsite mitigation is required, the Authority will be responsible for implementation, monitoring, and reporting. <i>Rev1</i>	X	X	X		Prior to construction/Post Construction monitoring and reporting as determined by regulatory agency permit conditions.	Condition of Design/Build Contract
	Bio-MM#44: Restore Temporary Impacts on Jurisdictional Waters. See description above in Impact Bio#4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>		X	X		Construction and Post-construction Follow reporting as determined by regulatory agency permit conditions.	Condition of Design/Build Contract
Bio#17: Construction of the HST alternatives would have indirect impacts on jurisdictional waters.	Bio-MM#45: Monitor Construction Activities within Jurisdictional Waters. See description above in Impact Bio#4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>		X	X		During ground-disturbing activities and Construction Follow reporting as determined by regulatory agency permit conditions.	Condition of Design/Build Contract
	Bio-MM#3: Prepare and Implement a Worker Environmental Awareness Program. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Training of all crew/construction personnel prior to start of construction. Provide weekly/monthly reporting as required by permit conditions.	Condition of Design/Build Contract
	Bio-MM#4: Prepare and Implement a Weed Control Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction/monthly memorandum to document the progress of the Weed Control Plan and implementation	Condition of Design/Build Contract
	Bio-MM#5: Prepare and Implement a Biological Resources Management Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Following implementation and reporting schedule as established by agency permit conditions.	Condition of Design/Build Contract. Biological Resources Management Plan (BRMP) and Construction plans
	Bio-MM#7: Delineate Environmentally Sensitive Areas and Environmentally Restricted Areas (on plans and in-field) See description above in Impact Bio#2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X	X		Prior to construction and Construction	Memorandum documenting compliance
	Bio-MM#8: Equipment Staging Areas. See description above in Impact Bio#2: Construction of the HST would disturb	Implementing Party: Contractor	X	X			Prior to construction Follow reporting	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	Great Valley mixed riparian forest and other riparian habitat.	Monitoring/Reporting Party: Contractor <i>Rev1</i>					requirements as established by agency permit conditions	
	Bio-MM#10: Vehicle Traffic. See description above in Impact Bio#2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During ground-disturbing activities. Report on weekly basis.	Condition of Design/Build Contract
	Bio-MM#15: Restore Temporary Riparian Impacts. See description above in Impact Bio#2: Construction of the HST would disturb Great Valley mixed riparian forest and other riparian habitat.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>			X		Post-construction. Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract Habitat Mitigation and Monitoring Plan (HMMP) and Memorandum documenting compliance and other reporting requirements in the 1600 Streambed Alteration Agreement.
	Bio-MM#19: Conduct Pre-Construction Sampling and Assessment for Vernal Pool Fauna. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X	X		Prior to ground-disturbing activities Follow reporting requirements as established by regulatory compliance permits.	Condition of Design/Build Contract Plan for monitoring, salvage, relocation, and propagation of special-status plant species and Memorandum documenting compliance
	Bio-MM#20: Seasonal Vernal Pool Work Restriction. See description above in Impact Bio#4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Pre-construction and during construction. Seasonal restrictions: October 15 to June 1 (corresponding to the rainy season), or as determined through informal or formal consultation with the USFWS or USACE. Report within 1 month of completing the field work	Condition of Design/Build Contract
	Bio-MM#21: Implement and Monitor Vernal Pool Protection. See description above in Impact Bio#4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor If offsite mitigation is required, the Authority will be responsible for implementation, monitoring, and reporting. <i>Rev1</i>	X	X	X		Prior to construction/Post Construction monitoring and reporting as determined by regulatory agency permit conditions.	Condition of Design/Build Contract
	Bio-MM#44: Restore Temporary Impacts on Jurisdictional Waters. See description above in Impact Bio#4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>		X	X		Construction and Post-construction Follow reporting as determined by regulatory agency permit conditions.	Condition of Design/Build Contract
	Bio-MM#45: Monitor Construction Activities within Jurisdictional Waters. See description above in Impact Bio#4: Construction of the HST would disturb	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>		X	X		During ground-disturbing activities and Construction Follow reporting as	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	suitable habitat that has potential to support vernal pool branchiopods. <i>Rev1</i>						determined by regulatory agency permit conditions.	
Bio#21: Construction of the HST alternatives would disturb Camp Pashayan (San Joaquin River Ecological Reserve).	Bio-MM#15: Restore Temporary Riparian Impacts. See description above in Impact Bio#6: Construction of the HST would disturb California tiger salamander habitat. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>			X		Post-construction. Follow reporting requirements as established by agency permit conditions	Condition of Design/Build Contract Habitat Mitigation and Monitoring Plan (HMMP) and Memorandum documenting compliance and other reporting requirements in the 1600 Streambed Alteration Agreement.
	Bio-MM#17: Conduct Pre-Construction Surveys for Special-Status Plant Species. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Pre-construction and Prior to ground-disturbing activities	Plan for monitoring, salvage, relocation, and propagation of special-status plant species and Memorandum documenting compliance
	Bio-MM#18: Prepare and Implement Plan for Salvage, Relocation and/or Propagation of Special-Status Plant Species. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X		X		Pre-construction and prior to ground-disturbing activities. Follow reporting requirements as established by regulatory compliance permits.	Condition of Design/Build Contract
	Bio-MM#19: Conduct Pre-Construction Sampling and Assessment for Vernal Pool Fauna. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X	X		Prior to ground-disturbing activities Follow reporting requirements as established by regulatory compliance permits.	Condition of Design/Build Contract Plan for monitoring, salvage, relocation, and propagation of special-status plant species and Memorandum documenting compliance
	Bio-MM#20: Seasonal Vernal Pool Work Restriction. See description above in Impact Bio#4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Pre-construction and during construction. Seasonal restrictions: October 15 to June 1 (corresponding to the rainy season), or as determined through informal or formal consultation with the USFWS or USACE. Report within 1 month of completing the field work	Condition of Design/Build Contract
	Bio-MM#21: Implement and Monitor Vernal Pool Protection. See description above in Impact Bio#4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor If offsite mitigation is required, the Authority will be responsible for implementation, monitoring, and reporting. <i>Rev1</i>	X	X	X		Prior to construction/Post Construction monitoring and reporting as determined by regulatory agency permit conditions.	Condition of Design/Build Contract
	Bio-MM#44: Restore Temporary Impacts on Jurisdictional Waters. See description above in Impact Bio#4: Construction of the HST would disturb	Implementing Party: Contractor Monitoring/Reporting Party: Contractor		X	X		Construction and Post-construction	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	suitable habitat that has potential to support vernal pool branchiopods.	<i>Rev1</i>					Follow reporting as determined by regulatory agency permit conditions.	
	Bio-MM#45: Monitor Construction Activities within Jurisdictional Waters. See description above in Impact Bio#4: Construction of the HST would disturb suitable habitat that has potential to support vernal pool branchiopods.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>		X	X		During ground-disturbing activities and Construction Follow reporting as determined by regulatory agency permit conditions.	Condition of Design/Build Contract
	PK-MM#4: Acquire Park Property for Camp Pashayan. Final design will continue to seek to minimize right-of-way impacts and pier placement in Camp Pashayan. Mitigation will include in-lieu fee for property impacts associated with pier installation as well as revegetation of disturbed areas with native plantings (consistent with CDFW vegetation/landscaping plans for the reserve). CDFW	Implementing Party: Contractor and Authority Monitoring/Reporting Party: Contractor in coordination with the Authority <i>Rev1</i>	X				Prior to construction/monthly reporting	The Authority will work with the California Department of Fish and Game to prepare and execute an agreement to acquire the property.
Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in Bio-IMPACT#16).	Bio-MM#14: Post-Construction Compliance Reports. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor and Authority Each Contractor will submit a Post-Construction Compliance Report at substantial contract completion for its own scope of work. The Authority will aggregate all reports and continue post-construction compliance reporting as required. <i>Rev1</i>			X		Post-construction	Condition of Design/Build Contract
	Bio-MM#49: Compensate for Permanent Riparian Impacts. The Authority will compensate for permanent impacts on Great Valley mixed riparian forest and other riparian habitats, determined in consultation with the appropriate agencies (e.g., CDFW), by restoring nearby areas to suitable habitat through permittee-responsible mitigation and/or by purchasing credits in a mitigation bank. Other relevant regulatory permits addressing riparian impacts include the CDFW 1600 Streambed Alteration Agreement, the USACE Section 404 Permit, and the SWRCB 401 Permit. The HMMP will provide the planning details as referenced in Bio-MM#58. Bio-MM#58 provides documentation and reporting requirements. Compensation will be based on the following ratios (acres of mitigation to acres of impact): <ul style="list-style-type: none">Great Valley Mixed Riparian Forest: 2:1Other Riparian: 2:1 <i>Rev1</i>	Implementing Party: Authority to compensate based on area of permanent riparian habitat impacted by the Contractor Monitoring/Reporting Party: Authority <i>Rev1</i>			X		Prior to Operations	Post-construction compliance reports consistent with the appropriate agency-issued permits
	Bio-MM#57: Conduct Delineation of Jurisdictional Waters and State Streambeds. The Contractor, prior to final design, will conduct a jurisdictional delineation, documenting jurisdictional waters and state streambeds consistent with USACE, SWRCB, and CDFW guidance. As part of the delineation, determine the functions and values of the jurisdictional waters using accepted methods such as the CRAM so that the functions and values have been replaced and that no net loss of jurisdictional waters and state streambed values occurs. Develop habitat replacement guidelines to identify and quantify habitats that are to be removed and identify the locations for restoring or relocating habitats. The	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Prior to ground-disturbing activities	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	Contractor will submit a memorandum to the Authority documenting compliance. <i>Rev1</i>							
	<p>Bio-MM#58: Prepare and Implement a Habitat Mitigation and Monitoring Plan. As part of the USFWS, USACE, SWRCB, and CDFW permit applications and prior to ground-disturbing activities, the Contractor will prepare an HMMP to mitigate for temporary and permanent impacts on jurisdictional waters and state streambeds. The HMMP will detail performance standards, including percent cover of native species, survivability, canopy cover requirements, wildlife utilization, the acreage basis, restoration ratios, and the combination of onsite and/or offsite mitigation. Preference shall be given to conduct the mitigation within the same watershed where the impact occurs. The Authority and Contractor will conduct work with the USACE, SWQCB, and CDFW to develop appropriate avoidance, minimization, mitigation, and monitoring measures to be incorporated into the HMMP. The intent of the HMMP is to mitigate for the lost functions and values of impacts on jurisdictional waters and state streambeds consistent with resource agency requirements and conditions presented in Sections 404 and 401 of the CWA and Section 1600 of the CFGC. It is also anticipated that since listed species such as California tiger salamander, colusa grass, and vernal pool branchiopods are nested within these habitats, the HMMP will also serve to mitigate for listed species through Section 7 of ESA and CESA 2081. The Contractor will submit a memorandum to the Authority documenting compliance. In the HMMP, the applicant or its designee shall incorporate the following standard requirements consistent with USACE, SWRCB, and CDFW guidelines:</p> <ul style="list-style-type: none"> • Description of the project impact/site. • Goal(s) (i.e., functions and values) of the compensatory mitigation project. • Description of the proposed compensatory mitigation site. • Implementation plan for the proposed compensatory mitigation site. • Maintenance activities during the monitoring period. • Monitoring plan for the compensatory mitigation site. • Completion of compensatory mitigation. • Contingency measures. <p>Additionally, the following will be included at a minimum for the implementation plan:</p> <ul style="list-style-type: none"> • Site analysis for appropriate soils and hydrology. • Site preparation specifications based on site analysis, including but not limited to grading and weeding. • Soil and plant material salvage from impact areas, as appropriate to the timing of impact and restoration as well as the location of restoration sites. • Specifications for plant and seed material appropriate to the locality of the mitigation site. • Specifications for site maintenance to establish the habitats, including but not limited to weeding and temporary irrigation. <p>Habitat restoration, enhancement, and/or establishment activities will be conducted on some of the compensatory (i.e., selected permittee-responsible) mitigation sites to achieve the mitigation goals. A detailed design of the mitigation habitats will be created in coordination with the permitting agencies</p>	<p>Implementing Party: Contractor and Authority Monitoring/Reporting Party: Contractor and Authority</p> <ol style="list-style-type: none"> 1. For off-site and compensatory mitigation activities, the Authority will be responsible for the production of that specific HMMP and implementation, monitoring and reporting against it 2. Any modifications of mitigation ratios will require consultation and agreement with Authority 3. Annual monitoring reports will be produced by the Contractor for its scope of work until substantial completion of the work at which time the Authority shall assume responsibility for production or assign the responsibility to other contractors. <p><i>Rev1</i></p>	X	X	X	X	Annual monitoring reports for 5 years (or less if success criteria are met as described earlier) and/or other documentation prescribed in the resource agency permits.	Documentation Reports demonstrating compliance with HMMP

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing					Implementation Mechanism or Tool
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	<p>and be described in the HMMP. It is recognized that several HMMPs will be developed consistent with the selected mitigation sites and the resources mitigated at each. The Contractor will ensure that construction is implemented in a manner that minimizes disturbance of such areas to the extent feasible. Temporary fencing will be used during construction to avoid sensitive biological resources that are adjacent to construction areas and can be avoided.</p> <p>Performance standards are targets for determining the effectiveness of the mitigation and assessing the need for adaptive management (e.g., mitigation design or maintenance revisions). Success criteria are formal criteria that must be met after a specific timeframe to meet regulatory requirements of the permitting agencies. Where applicable, replacement planting/seeding will be implemented if monitoring demonstrates that performance goals or success criteria are not met during a particular monitoring interval.</p> <p>The criteria for measuring performance will be used to determine whether the habitat improvement is trending toward sustainability (i.e., reduced human intervention) and to assess the need for adaptive management. These criteria must be met for the habitat improvement to be declared successful, both during a particular monitoring year and at the end of the establishment period. These performance criteria will be developed in consultation with the permitting agencies. The criteria include:</p> <ul style="list-style-type: none"> • Percent survival of planted trees (65–85%). • Percent survival of transplanted trees (60–85%). • Percent relative canopy cover (5–35%). • Percent cover of invasive species (<1%). • Percent cover of nonnative herbaceous plants (<10–25%). • Percent absolute cover of native species (>50–80%). • Percent relative cover of native species (>50%). • Percent total cover of plant species (20–75%). • Percent relative cover of wetland indicator species (75–90%). • Water level within +/-6 inches (or other measurement) of design. • Species composition and community diversity, relative to reference sites, and/or as described in the guidelines issued by permitting agencies (e.g., USFWS conservation guidelines for valley elderberry longhorn beetle). <p>Performance goals and success criteria will be provided for each of the years of monitoring and will be specific to habitat types at each permittee-responsible mitigation site. The monitoring schedule will be detailed in the site-specific HMMPs. To be deemed successful, the site may be required to meet the success criteria only in selected years. However, if success criteria are not met in specific years, remedial measures, including regrading, adjustment to modify the hydrological regime, and/or replacement planting or seeding, must be implemented and that year's monitoring must be repeated the following year until the success criteria are met. The success criteria specified must be reached without human intervention (e.g., irrigation, replacement plantings) aside from maintenance practices described in the site-specific HMMPs for maintenance during the establishment period.</p> <p>Where the HST alignment affects an existing mitigation bank, the Authority or its</p>							

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing					Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations			
	<p>designee will modify the mitigation ratio to meet the vernal pool mitigation requirement. The Authority or its designee will relocate the affected portion of the mitigation bank or compensate the landowner in accordance with the Uniform Relocation and Real Property Policy Act of 1970, as amended.</p> <p>The Contractor in coordination with the Authority will oversee the implementation of all HMMP elements and monitor consistent with the prescribed maintenance and performance monitoring requirements.</p> <p>The Contractor will prepare annual monitoring reports for 5 years (or less if success criteria are met as described earlier) and/or other documentation prescribed in the resource agency permits. In addition, the Contractor will document compliance and submit to the Authority.</p> <p><i>Rev1</i>CDFWContractor's biologist</p>								
	<p>Bio-MM#59: Compensate for Permanent Impacts on Jurisdictional Waters. The Authority will mitigate permanent wetland impacts through compensation determined in consultation with the USACE, SWRCB, USFWS, and CDFW, in order to be consistent with the HMMP (Bio-MM#58). Regulatory compliance for jurisdictional waters includes relevant terms and conditions from the USACE 404 Permit, SWRCB 401 Permit, and CDFW 1600 Streambed Alteration Agreement. The Authority will document compliance. Performance standards for jurisdictional waters are generally described in Bio-MM#58. It is important to recognize that Bio-MM#58 includes standards that apply to several resource areas (e.g., jurisdictional waters, riparian habitat, California tiger salamander habitat).</p> <p>Compensation could include one of the following:</p> <ul style="list-style-type: none"> • Purchase of credits from an agency-approved mitigation bank. • Fee-title-acquisition of natural resource agency-related property. • Purchase or establishment of a conservation easement with an endowment for long-term management of the property-specific conservation values. • In-lieu fee contribution determined through negotiation and consultation with the various natural resource regulatory agencies. <p>Base compensation for permanent impacts on the following ratios (acres of mitigation to acres of impact), pending agency confirmation:</p> <ul style="list-style-type: none"> • Vernal pools and other seasonal wetlands: 2:1 Preservation and 1:1 Creation. • Coastal and Valley Freshwater Marsh: 1:1. • Other Wetlands: Between 1.1:1 and 1.5:1 (1:1 onsite and 0.1 to 0.5:1 offsite), based on function and values lost. • Ratios determined in consultation with the appropriate agencies. <p>The Authority will mitigate impacts on jurisdictional waters by replacing,</p>	<p>Implementing Party: Authority to compensate based on area of permanent jurisdictional waters impacted by the Contractor</p> <p>Monitoring/Reporting Party: Authority</p> <p><i>Rev1</i></p>	X	X	X		Prior to Operations	Documentation of compliance with permit conditions	

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	<p>creating, restoring, or preserving the identified resource at the ratios presented below or other ratio that compensates for functions and values lost. The Authority or its designee will consider modifying the vernal pool mitigation ratio in the final permits based on site-specific conditions and the specific life history requirements of vernal pool branchiopods, California tiger salamanders, and western spadefoot toads.</p> <p>Where the HST Alternative affects an existing mitigation bank, the Authority or its designee will modify the mitigation ratio to meet the vernal pool mitigation requirement. Relocate the affected portion of the mitigation bank or provide compensation to the holder of the conservation easement, in accordance with the <i>Uniform Relocation and Real Property Policy Act of 1970</i>, as amended. Through the HMMP reporting program and the applicable terms and conditions from the USACE 404 Permit, SWRCB 401 Permit, and the CDFW 1600 Streambed Alteration Agreement, the Authority will document compliance.</p> <p><i>Rev1</i></p>							
	<p>Bio-MM#60: Offsite Habitat Restoration, Enhancement, and Preservation. Prior to site preparation at the mitigation site, the Authority or its designee will consider the offsite habitat restoration, enhancement, or preservation program, and identify short-term temporary and/or long-term permanent effects on the natural landscape. A determination will be made on any effects from the physical alteration of the site to onsite biological resources, including plant communities, land cover types, and the distribution of special-status plants and wildlife.</p> <p>Appropriate seasonal restrictions (e.g., breeding season) may be applicable if appropriate habitats exist onsite. Activities resulting in the physical alteration of the site include grading/modifications to onsite topography, stockpiling, storage of equipment, installation of temporary irrigation, removal of invasive species, and drainage feature treatments. In general, the long-term improvements to habitat functions and values will offset temporary effects during restoration, enhancement, or preservation activities.</p> <p>The offsite habitat restoration, enhancement, and preservation program will be designed, implemented, and monitored consistent with the terms and conditions of the USACE Section 404 Permit, CDFW 1600 Streambed Alteration Agreement, and CESA and federal ESA as they apply to their jurisdiction and resources onsite. Potential effects on site-specific hydrology and the downstream resources will be evaluated as a result of implementation of the restoration-related activity. Site-specific BMPs and an SWPPP will be implemented as appropriate.</p> <ul style="list-style-type: none"> The Authority or its designee will report on compliance with permitting requirements. The Authority will be responsible for the monitoring and tracking of the program and will document compliance. <p><i>Rev1</i></p>	<p>Implementing Party: Authority to implement offsite mitigation based on effects from the physical alteration of onsite biological resources by the Contractor</p> <p>Monitoring/Reporting Party: Authority</p> <p>The Contractor shall monitor any activities and prepare any reports required where its construction activities contribute to the requirement for this mitigation measure</p> <p><i>Rev1</i></p>	X	X	X		Pre-Construction, Construction, Post-Construction	Offsite habitat restoration, enhancement, and preservation program will be designed, implemented, and monitored consistent with the terms and conditions of the USACE Section 404 Permit, CDFW 1600 Streambed Alteration Agreement, and CESA and federal ESA as they apply to their jurisdiction and resources onsite
	<p>Bio-MM#4: Prepare and Implement a Weed Control Plan.</p> <p>See description above in Impact Bio#1: Introduction of Noxious Weeds.</p> <p><i>Rev1</i></p>	<p>Implementing Party: Contractor</p> <p>Monitoring/Reporting Party: Contractor</p> <p><i>Rev1</i></p>	X	X			Prior to construction/monthly memorandum to document the progress of the Weed Control Plan and implementation	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
Bio#23: Project period impacts from the HST alternatives would permanently convert suitable habitat that has potential to support special-status plant species.	Bio-MM#14: Post-Construction Compliance Reports. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor and Authority Each Contractor will submit a Post-Construction Compliance Report at substantial contract completion for its own scope of work. The Authority will aggregate all reports and continue post-construction compliance reporting as required. <i>Rev1</i>			X		Post-construction	Condition of Design/Build Contract
	Bio-MM#50: Compensate for Impacts on Special-Status Plant Species. Prior to Final Design and during the permitting process, the Authority will comply with CESA and the federal ESA by implementing the following measures: Purchase credits from an existing mitigation bank or conduct a special-status plant re-establishment program within the same watershed or in proximity to the impact area at a 1:1 ratio. The success of the special status plant species program is related to the success of the vernal pools. Restored areas must be similar in species composition and ecosystem function to the reference habitat to be considered completed and successful at the end of the monitoring period. In general, this means that data collected on restored or enhanced pools must fall within the range of data obtained from reference pools. General performance standards and guidelines are presented in Bio-MM#58. Mitigate the impacts on special-status plants in accordance with the USFWS Biological Opinion and/or CDFW 2081(b). The Authority will document compliance. <i>Rev1</i>	Implementing Party: Authority to compensate based on area of special-status plant species habitat impacted by the Contractor Monitoring/Reporting Party: Authority The Contractor shall monitor any activities and prepare any reports required where its construction activities contribute to the requirement for this mitigation measure <i>Rev1</i>	X	X	X		Prior to final design	Memorandum documenting compliance
	Bio-MM#51: Implement Conservation Guidelines During the Project Period for Valley Elderberry Longhorn Beetle. The Authority or its designee will conduct compensatory mitigation for the valley elderberry longhorn beetle, including transplantation and replacement of elderberry shrubs, and maintenance for replacement shrubs, following the USFWS' <i>Conservation Guidelines for the Valley Elderberry Longhorn Beetle</i> (USFWS 1999a). Performance standards for valley elderberry longhorn beetle habitat are generally described in Bio-MM#58. It is important to recognize that Bio-MM#58 includes standards that apply to several resource areas (e.g., jurisdictional waters, riparian habitat, California tiger salamander habitat). The Authority will document compliance. <i>Rev1</i>	Implementing Party: Authority to compensate based on area of Valley Elderberry Longhorn Beetle habitat impacted by the Contractor Monitoring/Reporting Party: Authority The Contractor shall monitor any activities and prepare any reports required where its construction activities contribute to the requirement for this mitigation measure <i>Rev1</i>			X		Prior to Operations	Memorandum documenting compliance
	Bio-MM#57: Conduct Delineation of Jurisdictional Waters and State Streambeds. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Prior to ground-disturbing activities	Condition of Design/Build Contract
	Bio-MM#58: Prepare and Implement a Habitat Mitigation and Monitoring Plan. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other	Implementing Party: Contractor and Authority Monitoring/Reporting Party: Contractor and Authority 1. For off-site and compensatory mitigation activities, the Authority will be responsible for the production	X	X	X	X	Annual monitoring reports for 5 years (or less if success criteria are met as described earlier) and/or	Documentation Reports demonstrating compliance with HMMP

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	<p>of that specific HMMP and implementation, monitoring and reporting against it</p> <p>2. Any modifications of mitigation ratios will require consultation and agreement with Authority</p> <p>3. Annual monitoring reports will be produced by the Contractor for its scope of work until substantial completion of the work at which time the Authority shall assume responsibility for production or assign the responsibility to other contractors.</p> <p><i>Rev1</i></p>					other documentation prescribed in the resource agency permits.	
	<p>Bio-MM#59: Compensate for Permanent Impacts on Jurisdictional Waters.</p> <p>See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).</p>	<p>Implementing Party: Authority to compensate based on area of permanent jurisdictional waters impacted by the Contractor</p> <p>Monitoring/Reporting Party: Authority</p> <p><i>Rev1</i></p>	X	X	X		Prior to Operations	Documentation of compliance with permit conditions
	<p>Bio-MM#60: Offsite Habitat Restoration, Enhancement and Preservation.</p> <p>See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).</p>	<p>Implementing Party: Authority to implement offsite mitigation based on effects from the physical alteration of onsite biological resources by the Contractor</p> <p>Monitoring/Reporting Party: Authority</p> <p>The Contractor shall monitor any activities and prepare any reports required where its construction activities contribute to the requirement for this mitigation measure</p> <p><i>Rev1</i></p>	X	X	X		Pre-Construction, Construction, Post-Construction	Offsite habitat restoration, enhancement, and preservation program will be designed, implemented, and monitored consistent with the terms and conditions of the USACE Section 404 Permit, CDFW 1600 Streambed Alteration Agreement, and CESA and federal ESA as they apply to their jurisdiction and resources onsite
	<p>Bio-MM#4: Prepare and Implement a Weed Control Plan.</p> <p>See description above in Impact Bio#1: Introduction of Noxious Weeds.</p>	<p>Implementing Party: Contractor</p> <p>Monitoring/Reporting Party: Contractor</p> <p><i>Rev1</i></p>	X	X			Prior to construction/monthly memorandum to document the progress of the Weed Control Plan and implementation	Condition of Design/Build Contract
Bio#24: Project period impacts from the HST alternatives would permanently convert suitable habitat that has the	<p>Bio-MM#14: Post-Construction Compliance Reports.</p> <p>See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.</p>	<p>Implementing Party: Contractor</p> <p>Monitoring/Reporting Party: Contractor and Authority</p> <p>Each Contractor will submit a Post-Construction Compliance Report at substantial contract completion for its own scope of work. The Authority will aggregate all reports and continue post-construction compliance reporting as required.</p> <p><i>Rev1</i></p>			X		Post-construction	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
potential to support vernal pool branchiopods.	Bio-MM#57: Conduct Delineation of Jurisdictional Waters and State Streambeds. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Prior to ground-disturbing activities	Condition of Design/Build Contract
	Bio-MM#58: Prepare and Implement a Habitat Mitigation and Monitoring Plan. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Contractor and Authority Monitoring/Reporting Party: Contractor and Authority 1. For off-site and compensatory mitigation activities, the Authority will be responsible for the production of that specific HMMP and implementation, monitoring and reporting against it 2. Any modifications of mitigation ratios will require consultation and agreement with Authority 3. Annual monitoring reports will be produced by the Contractor for its scope of work until substantial completion of the work at which time the Authority shall assume responsibility for production or assign the responsibility to other contractors. <i>Rev1</i>	X	X	X	X	Annual monitoring reports for 5 years (or less if success criteria are met as described earlier) and/or other documentation prescribed in the resource agency permits.	Documentation Reports demonstrating compliance with HMMP
	Bio-MM#59: Compensate for Permanent Impacts on Jurisdictional Waters. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Authority to compensate based on area of permanent jurisdictional waters impacted by the Contractor Monitoring/Reporting Party: Authority <i>Rev1</i>	X	X	X		Prior to Operations	Documentation of compliance with permit conditions
	Bio-MM#60: Offsite Habitat Restoration, Enhancement and Preservation. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Authority to implement offsite mitigation based on effects from the physical alteration of onsite biological resources by the Contractor Monitoring/Reporting Party: Authority The Contractor shall monitor any activities and prepare any reports required where its construction activities contribute to the requirement for this mitigation measure <i>Rev1</i>	X	X	X		Pre-Construction, Construction, Post-Construction	Offsite habitat restoration, enhancement, and preservation program will be designed, implemented, and monitored consistent with the terms and conditions of the USACE Section 404 Permit, CDFW 1600 Streambed Alteration Agreement, and CESA and federal ESA as they apply to their jurisdiction and resources onsite
	Bio-MM#4: Prepare and Implement a Weed Control Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction/monthly memorandum to document the progress of the Weed Control Plan and implementation	Condition of Design/Build Contract CDFW

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
Bio#25: Project period impacts from the HST alternatives would permanently convert suitable habitat that has the potential to support valley elderberry longhorn beetle.	Bio-MM#14: Post-Construction Compliance Reports. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor and Authority Each Contractor will submit a Post-Construction Compliance Report at substantial contract completion for its own scope of work. The Authority will aggregate all reports and continue post-construction compliance reporting as required. <i>Rev1</i>			X		Post-construction	Condition of Design/Build Contract
	Bio-MM#51: Implement Conservation Guidelines During the Project Period for Valley Elderberry Longhorn Beetle. See description above in Impact Bio#23: Project period impacts from the HST would permanently convert suitable habitat that has potential to support special-status plant species.	Implementing Party: Authority to compensate based on area of Valley Elderberry Longhorn Beetle habitat impacted by the Contractor Monitoring/Reporting Party: Authority The Contractor shall monitor any activities and prepare any reports required where its construction activities contribute to the requirement for this mitigation measure <i>Rev1</i>			X		Prior to Operations	Memorandum documenting compliance
	Bio-MM#60: Offsite Habitat Restoration, Enhancement and Preservation. See description above in Impact Bio #24: Project period impacts for the HST would permanently convert suitable habitat that has the potential to support vernal pool branchiopods.	Implementing Party: Authority to implement offsite mitigation based on effects from the physical alteration of onsite biological resources by the Contractor Monitoring/Reporting Party: Authority The Contractor shall monitor any activities and prepare any reports required where its construction activities contribute to the requirement for this mitigation measure <i>Rev1</i>	X	X	X		Pre-Construction, Construction, Post-Construction	Offsite habitat restoration, enhancement, and preservation program will be designed, implemented, and monitored consistent with the terms and conditions of the USACE Section 404 Permit, CDFW 1600 Streambed Alteration Agreement, and CESA and federal ESA as they apply to their jurisdiction and resources onsite
	Bio-MM#4: Prepare and Implement a Weed Control Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction/monthly memorandum to document the progress of the Weed Control Plan and implementation	Condition of Design/Build Contract CDFW
Bio#26: Project period impacts from the HST alternatives would permanently convert suitable habitat that has the potential to support California tiger salamander.	Bio-MM#14: Post-Construction Compliance Reports. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor and Authority Each Contractor will submit a Post-Construction Compliance Report at substantial contract completion for its own scope of work. The Authority will aggregate all reports and continue post-construction compliance reporting as required. <i>Rev1</i>			X		Post-construction	Condition of Design/Build Contract
	Bio-MM#52: Compensate for Impacts on California Tiger Salamander. The Authority or its designee will determine compensatory mitigation for the temporary and permanent loss of suitable upland and aquatic breeding habitat through agency consultation with the USFWS and CDFW. Performance standards for California tiger salamander habitat are generally described in Bio-MM#58. It is important to recognize that Bio-MM#58 includes standards that apply to several resource areas (e.g., jurisdictional waters, riparian habitat,	Implementing Party: Authority to compensate based on area of temporary and permanent California Tiger Salamander habitat impacted by the Contractor Monitoring/Reporting Party: Authority The Contractor shall monitor any activities and prepare any reports required where its construction activities contribute to the requirement for this mitigation measure	X	X	X		Prior to Operations	Memorandum documenting compliance with agency-issued BO and 2081 Determination.

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	<p>California tiger salamander habitat). Compensatory mitigation could include one of the following:</p> <ul style="list-style-type: none"> • Purchase of credits from an agency-approved mitigation bank. • Fee-title-acquisition of natural resource regulatory agency-approved property. • Purchase or establishment of a conservation easement with an endowment for long-term management of the property-specific conservation values. • In-lieu fee contribution determined through negotiation and consultation with the various natural resource regulatory agencies. • Implementation of USFWS Biological Opinion and/or CDFW 2081(b). <p>The Authority will document compliance.</p> <p><i>Rev1</i></p>	<i>Rev1</i>						
	<p>Bio-MM#57: Conduct Delineation of Jurisdictional Waters and State Streambeds. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor</p> <p><i>Rev1</i></p>	X				Prior to ground-disturbing activities	Condition of Design/Build Contract
	<p>Bio-MM#58: Prepare and Implement a Habitat Mitigation and Monitoring Plan. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).</p>	<p>Implementing Party: Contractor and Authority Monitoring/Reporting Party: Contractor and Authority</p> <ol style="list-style-type: none"> 1. For off-site and compensatory mitigation activities, the Authority will be responsible for the production of that specific HMMP and implementation, monitoring and reporting against it 2. Any modifications of mitigation ratios will require consultation and agreement with Authority 3. Annual monitoring reports will be produced by the Contractor for its scope of work until substantial completion of the work at which time the Authority shall assume responsibility for production or assign the responsibility to other contractors. <p><i>Rev1</i></p>	X	X	X	X	Annual monitoring reports for 5 years (or less if success criteria are met as described earlier) and/or other documentation prescribed in the resource agency permits.	Documentation Reports demonstrating compliance with HMMP
	<p>Bio-MM#59: Compensate for Permanent Impacts on Jurisdictional Waters. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).</p>	<p>Implementing Party: Authority to compensate based on area of permanent jurisdictional waters impacted by the Contractor Monitoring/Reporting Party: Authority</p> <p><i>Rev1</i></p>	X	X	X		Prior to Operations	Documentation of compliance with permit conditions

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	Bio-MM#60: Offsite Habitat Restoration, Enhancement and Preservation. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Authority to implement offsite mitigation based on effects from the physical alteration of onsite biological resources by the Contractor Monitoring/Reporting Party: Authority The Contractor shall monitor any activities and prepare any reports required where its construction activities contribute to the requirement for this mitigation measure <i>Rev1</i>	X	X	X		Pre-Construction, Construction, Post-Construction	Offsite habitat restoration, enhancement, and preservation program will be designed, implemented, and monitored consistent with the terms and conditions of the USACE Section 404 Permit, CDFW 1600 Streambed Alteration Agreement, and CESA and federal ESA as they apply to their jurisdiction and resources onsite
	Bio-MM#4: Prepare and Implement a Weed Control Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction/monthly memorandum to document the progress of the Weed Control Plan and implementation	Condition of Design/Build Contract CDFW
Bio#27: Project period impacts from the HST alternatives would permanently convert suitable habitat that has the potential to support western spadefoot toad.	Bio-MM#14: Post-Construction Compliance Reports. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor and Authority Each Contractor will submit a Post-Construction Compliance Report at substantial contract completion for its own scope of work. The Authority will aggregate all reports and continue post-construction compliance reporting as required. <i>Rev1</i>			X		Post-construction	Memorandum documenting compliance
	Bio-MM#25: Conduct Emergence and Larval Surveys for Western Spadefoot Toad. See above in Impact Bio#7: Construction of the HST would disturb western spadefoot toad habitat. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Pre-construction surveys. Prior to ground-disturbing activities. Follow reporting as determined by regulatory permit conditions.	Condition of Design/Build Contract
	Bio-MM#52: Compensate for Impacts on California Tiger Salamander. See description above in Impact Bio#26: Project period impacts from the HST would permanently convert suitable habitat that has the potential to support California tiger salamander. Contractor's biologist	Implementing Party: Authority to compensate based on area of temporary and permanent California Tiger Salamander habitat impacted by the Contractor Monitoring/Reporting Party: Authority The Contractor shall monitor any activities and prepare any reports required where its construction activities contribute to the requirement for this mitigation measure <i>Rev1</i>	X	X	X		Prior to Operations	Memorandum documenting compliance with agency-issued B) and 2081 Determination.
	Bio-MM#57: Conduct Delineation of Jurisdictional Waters and State Streambeds. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Prior to ground-disturbing activities	Condition of Design/Build Contract
	Bio-MM#58: Prepare and Implement a Habitat Mitigation and Monitoring Plan.	Implementing Party: Contractor and Authority Monitoring/Reporting Party: Contractor and Authority	X	X	X	X	Annual monitoring reports for 5 years (or less if	Documentation Reports demonstrating compliance with

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	<ol style="list-style-type: none"> For off-site and compensatory mitigation activities, the Authority will be responsible for the production of that specific HMMP and implementation, monitoring and reporting against it Any modifications of mitigation ratios will require consultation and agreement with Authority Annual monitoring reports will be produced by the Contractor for its scope of work until substantial completion of the work at which time the Authority shall assume responsibility for production or assign the responsibility to other contractors. <i>Rev1</i>					success criteria are met as described earlier) and/or other documentation prescribed in the resource agency permits.	HMMP
	Bio-MM#59: Compensate for Permanent Impacts on Jurisdictional Waters. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Authority to compensate based on area of permanent jurisdictional waters impacted by the Contractor Monitoring/Reporting Party: Authority <i>Rev1</i>	X	X	X		Prior to Operations	Documentation of compliance with permit conditions
	Bio-MM#60: Offsite Habitat Restoration, Enhancement and Preservation. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Authority to implement offsite mitigation based on effects from the physical alteration of onsite biological resources by the Contractor Monitoring/Reporting Party: Authority The Contractor shall monitor any activities and prepare any reports required where its construction activities contribute to the requirement for this mitigation measure <i>Rev1</i>	X	X	X		Pre-Construction, Construction, Post-Construction	Offsite habitat restoration, enhancement, and preservation program will be designed, implemented, and monitored consistent with the terms and conditions of the USACE Section 404 Permit, CDFW 1600 Streambed Alteration Agreement, and CESA and federal ESA as they apply to their jurisdiction and resources onsite
	Bio-MM#4: Prepare and Implement a Weed Control Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction/monthly memorandum to document the progress of the Weed Control Plan and implementation	Condition of Design/Build Contract CDFW
Bio#28: Project period impacts from the HST alternatives would permanently convert suitable habitat that has the potential to support western pond turtle.	Bio-MM#14: Post-Construction Compliance Reports. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor and Authority Each Contractor will submit a Post-Construction Compliance Report at substantial contract completion for its own scope of work. The Authority will aggregate all reports and continue post-construction compliance reporting as required. <i>Rev1</i>			X		Post-construction	Condition of Design/Build Contract
	Bio-MM#49: Compensate for Permanent Riparian Impacts. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Authority to compensate based on area of permanent riparian habitat impacted by the Contractor Monitoring/Reporting Party: Authority <i>Rev1</i>			X		Prior to Operations	Post-construction compliance reports consistent with the appropriate agency-issued permits

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	Bio-MM#53: Implement Western Pond Turtle Mitigation Measures. See description above in Impact Bio#8: Construction of the HST would disturb habitat that supports the western pond turtle. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X	X		Schedule according to BO and 2081 Determination	Memorandum documenting compliance with BO and 2081 Determination
	Bio-MM#57: Conduct Delineation of Jurisdictional Waters and State Streambeds. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Prior to ground-disturbing activities	Condition of Design/Build Contract
	Bio-MM#58: Prepare and Implement a Habitat Mitigation and Monitoring Plan. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Contractor and Authority Monitoring/Reporting Party: Contractor and Authority 1. For off-site and compensatory mitigation activities, the Authority will be responsible for the production of that specific HMMP and implementation, monitoring and reporting against it 2. Any modifications of mitigation ratios will require consultation and agreement with Authority 3. Annual monitoring reports will be produced by the Contractor for its scope of work until substantial completion of the work at which time the Authority shall assume responsibility for production or assign the responsibility to other contractors. <i>Rev1</i>	X	X	X	X	Annual monitoring reports for 5 years (or less if success criteria are met as described earlier) and/or other documentation prescribed in the resource agency permits.	Documentation Reports demonstrating compliance with HMMP
	Bio-MM#59: Compensate for Permanent Impacts on Jurisdictional Waters. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Authority to compensate based on area of permanent jurisdictional waters impacted by the Contractor Monitoring/Reporting Party: Authority <i>Rev1</i>	X	X	X		Prior to Operations	Documentation of compliance with permit conditions
	Bio-MM#60: Offsite Habitat Restoration, Enhancement and Preservation. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Authority to implement offsite mitigation based on effects from the physical alteration of onsite biological resources by the Contractor Monitoring/Reporting Party: Authority The Contractor shall monitor any activities and prepare any reports required where its construction activities contribute to the requirement for this mitigation measure <i>Rev1</i>	X	X	X		Pre-Construction, Construction, Post-Construction	Offsite habitat restoration, enhancement, and preservation program will be designed, implemented, and monitored consistent with the terms and conditions of the USACE Section 404 Permit, CDFW 1600 Streambed Alteration Agreement, and CESA and federal ESA as they apply to their jurisdiction and resources onsite
	Bio-MM#4: Prepare and Implement a Weed Control Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction/monthly memorandum to document the progress of the Weed Control Plan and implementation	Condition of Design/Build Contract CDFW

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
Bio#30: Project period impacts from the HST alternatives would permanently convert suitable habitat that has the potential to support nesting Swainson's hawk.	Bio-MM#4: Prepare and Implement a Weed Control Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction/monthly memorandum to document the progress of the Weed Control Plan and implementation	Condition of Design/Build Contract CDFW
	Bio-MM#14: Post-Construction Compliance Reports. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor and Authority Each Contractor will submit a Post-Construction Compliance Report at substantial contract completion for its own scope of work. The Authority will aggregate all reports and continue post-construction compliance reporting as required. <i>Rev1</i>			X		Post-construction	Condition of Design/Build Contract
	Bio-MM#49: Compensate for Permanent Riparian Impacts. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Authority to compensate based on area of permanent riparian habitat impacted by the Contractor Monitoring/Reporting Party: Authority <i>Rev1</i>			X		Prior to Operations	Post-construction compliance reports consistent with the appropriate agency-issued permits
	Bio-MM#54: Compensate for Loss of Swainson's Hawk Foraging Habitat. To compensate for the loss of Swainson's hawk foraging habitat, the Authority or its designee will provide compensatory mitigation that follows the ratios recommended by CDFW's (1994) Staff Report Regarding Mitigation for Impacts to Swainson's hawks in the Central Valley. The Authority will document compliance. The ratios are based on the distance from the construction footprint to the closest active nest site (which for this species is defined as a nest used one or more times in the last 5 years), as follows: <ul style="list-style-type: none"> • Compensate where impacts on foraging habitat occur within 1 mile of an active nest tree, at a 1:1 ratio on agricultural lands or other suitable foraging habitat; or at a 0.5:1 ratio where habitat can be managed for prey production. • Compensate where impacts on foraging habitat occur within 5 miles, but more than 1 mile from an active nest tree, at a 0.75:1 ratio. • Compensate where impacts on foraging habitat occur within 10 miles, but more than 5 miles from an active nest tree, at a 0.5:1 ratio. • Mitigate the impacts on special-status plants in accordance with the USFWS Biological Opinion and/or CDFW 2081(b). <i>Rev1</i>	Implementing Party: Authority to compensate based on area of Swainson's hawk foraging habitat impacted by the Contractor Monitoring/Reporting Party: Authority <i>Rev1</i>	X	X	X		Prior to Operations	Memorandum documenting compliance
	Bio-MM#57: Conduct Delineation of Jurisdictional Waters and State Streambeds. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Prior to ground-disturbing activities	Condition of Design/Build Contract
	Bio-MM#58: Prepare and Implement a Habitat Mitigation and Monitoring Plan. See description above in Impact Bio#22: Project period impacts from the HST	Implementing Party: Contractor and Authority Monitoring/Reporting Party: Contractor and Authority 1. For off-site and compensatory mitigation activities,	X	X	X	X	Annual monitoring reports for 5 years (or less if success criteria are met as	Documentation Reports demonstrating compliance with HMMP

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	<p>the Authority will be responsible for the production of that specific HMMP and implementation, monitoring and reporting against it</p> <p>2. Any modifications of mitigation ratios will require consultation and agreement with Authority</p> <p>3. Annual monitoring reports will be produced by the Contractor for its scope of work until substantial completion of the work at which time the Authority shall assume responsibility for production or assign the responsibility to other contractors.</p> <p><i>Rev1</i></p>					described earlier) and/or other documentation prescribed in the resource agency permits.	
	<p>Bio-MM#59: Compensate for Permanent Impacts on Jurisdictional Waters. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).</p>	<p>Implementing Party: Authority to compensate based on area of permanent jurisdictional waters impacted by the Contractor Monitoring/Reporting Party: Authority <i>Rev1</i></p>	X	X	X		Prior to Operations	Documentation of compliance with permit conditions
	<p>Bio-MM#60: Offsite Habitat Restoration, Enhancement and Preservation. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).</p>	<p>Implementing Party: Authority to implement offsite mitigation based on effects from the physical alteration of onsite biological resources by the Contractor Monitoring/Reporting Party: Authority The Contractor shall monitor any activities and prepare any reports required where its construction activities contribute to the requirement for this mitigation measure <i>Rev1</i></p>	X	X	X		Pre-Construction, Construction, Post-Construction	Offsite habitat restoration, enhancement, and preservation program will be designed, implemented, and monitored consistent with the terms and conditions of the USACE Section 404 Permit, CDFW 1600 Streambed Alteration Agreement, and CESA and federal ESA as they apply to their jurisdiction and resources onsite. CDFW
Bio#31: Project period impacts from the HST alternatives would permanently convert suitable habitat that has the potential to support burrowing owls.	<p>Bio-MM#14: Post-Construction Compliance Reports. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species. <i>Rev1</i></p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor and Authority Each Contractor will submit a Post-Construction Compliance Report at substantial contract completion for its own scope of work. The Authority will aggregate all reports and continue post-construction compliance reporting as required. <i>Rev1</i></p>			X		Post-construction	Condition of Design/Build Contract
	<p>Bio-MM#55: Compensate for Loss of Burrowing Owl Foraging and Breeding Habitat. The Authority or its designee will provide base compensatory mitigation for the temporary and permanent loss of foraging and breeding habitat on the number of western burrowing owl pairs or individuals affected. Compensation will be at a 6.5:1 ratio (acres of habitat: number of pairs or individuals). Mitigate each occupied burrow destroyed by enlarging or enhancing existing unsuitable burrows at a 2:1 ratio based on CDFW's (1995) <i>Staff Report on Burrowing Owl Mitigation</i>. The Authority will document compliance. <i>Rev1</i></p>	<p>Implementing Party: Authority to compensate based on area of Burrowing Owl foraging and breeding habitat impacted by the Contractor Monitoring/Reporting Party: Authority <i>Rev1</i></p>	X	X	X		Prior to Operations	Memorandum documenting compliance with CDFW guidance
Bio#32: Project	Bio-MM#14: Post-Construction Compliance Reports.	Implementing Party: Contractor			X		Post-construction	Condition of Design/Build Contract

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
<p>period impacts from the HST alternatives would permanently convert suitable habitat that has the potential to support breeding birds, including raptors and burrowing owls.</p>	See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	<p>Monitoring/Reporting Party: Contractor and Authority</p> <p>Each Contractor will submit a Post-Construction Compliance Report at substantial contract completion for its own scope of work. The Authority will aggregate all reports and continue post-construction compliance reporting as required.</p> <p><i>Rev1</i></p>						
	<p>Bio-MM#49: Compensate for Permanent Riparian Impacts.</p> <p>See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).</p>	<p>Implementing Party: Authority to compensate based on area of permanent riparian habitat impacted by the Contractor</p> <p>Monitoring/Reporting Party: Authority</p> <p><i>Rev1</i></p>			X		Prior to Operations	Post-construction compliance reports consistent with the appropriate agency-issued permits
	<p>Bio-MM#54: Compensate for Loss of Swainson’s Hawk Foraging Habitat.</p> <p>See description above in Impact Bio#30: Project period impacts from the HST would permanently convert suitable habitat that has the potential to support nesting Swainson’s hawk.</p>	<p>Implementing Party: Authority to compensate based on area of Swainson’s hawk foraging habitat impacted by the Contractor</p> <p>Monitoring/Reporting Party: Authority</p> <p><i>Rev1</i></p>	X	X	X		Prior to Operations	Memorandum documenting compliance
	<p>Bio-MM#55: Compensate for Loss of Burrowing Owl Foraging and Breeding Habitat.</p> <p>See description above in Impact Bio#31: Project period impacts from the HST would permanently convert suitable habitat that has the potential to support burrowing owls.</p> <p><i>Rev1</i></p>	<p>Implementing Party: Authority to compensate based on area of Burrowing Owl foraging and breeding habitat impacted by the Contractor</p> <p>Monitoring/Reporting Party: Authority</p> <p><i>Rev1</i></p>	X	X	X		Prior to Operations	Memorandum documenting compliance with CDFW guidance CDFW
	<p>Bio-MM#57: Conduct Delineation of Jurisdictional Waters and State Streambeds.</p> <p>See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).</p>	<p>Implementing Party: Contractor</p> <p>Monitoring/Reporting Party: Contractor</p> <p><i>Rev1</i></p>	X				Prior to ground-disturbing activities	Condition of Design/Build Contract
	<p>Bio-MM#58: Prepare and Implement a Habitat Mitigation and Monitoring Plan.</p> <p>See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).</p>	<p>Implementing Party: Contractor and Authority</p> <p>Monitoring/Reporting Party: Contractor and Authority</p> <ol style="list-style-type: none"> For off-site and compensatory mitigation activities, the Authority will be responsible for the production of that specific HMMP and implementation, monitoring and reporting against it Any modifications of mitigation ratios will require consultation and agreement with Authority Annual monitoring reports will be produced by the Contractor for its scope of work until substantial completion of the work at which time the Authority shall assume responsibility for production or assign the responsibility to other contractors. <p><i>Rev1</i></p>	X	X	X	X	Annual monitoring reports for 5 years (or less if success criteria are met as described earlier) and/or other documentation prescribed in the resource agency permits.	Documentation Reports demonstrating compliance with HMMP
	<p>Bio-MM#59: Compensate for Permanent Impacts on Jurisdictional Waters.</p> <p>See description above in Impact Bio#22: Project period impacts from the HST</p>	<p>Implementing Party: Authority to compensate based on area of permanent jurisdictional waters impacted by the Contractor</p>	X	X	X		Prior to Operations	Documentation of compliance with permit conditions

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Monitoring/Reporting Party: Authority <i>Rev1</i>						
	Bio-MM#60: Offsite Habitat Restoration, Enhancement and Preservation. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Authority to implement offsite mitigation based on effects from the physical alteration of onsite biological resources by the Contractor Monitoring/Reporting Party: Authority The Contractor shall monitor any activities and prepare any reports required where its construction activities contribute to the requirement for this mitigation measure <i>Rev1</i>	X	X	X		Pre-Construction, Construction, Post-Construction	Offsite habitat restoration, enhancement, and preservation program will be designed, implemented, and monitored consistent with the terms and conditions of the USACE Section 404 Permit, CDFW 1600 Streambed Alteration Agreement, and CESA and federal ESA as they apply to their jurisdiction and resources onsite
	Bio-MM#4: Prepare and Implement a Weed Control Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction/monthly memorandum to document the progress of the Weed Control Plan and implementation	Condition of Design/Build Contract CDFW
Bio#33: Project period impacts from the HST alternatives would permanently convert suitable habitat that has the potential to support special-status bats.	Bio-MM#14: Post-Construction Compliance Reports. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor and Authority Each Contractor will submit a Post-Construction Compliance Report at substantial contract completion for its own scope of work. The Authority will aggregate all reports and continue post-construction compliance reporting as required. <i>Rev1</i>			X		Post-construction	HMMP
	Bio-MM#49: Compensate for Permanent Riparian Impacts. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Authority to compensate based on area of permanent riparian habitat impacted by the Contractor Monitoring/Reporting Party: Authority <i>Rev1</i>			X		Prior to Operations	Post-construction compliance reports consistent with the appropriate agency-issued permits
	Bio-MM#57: Conduct Delineation of Jurisdictional Waters and State Streambeds. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Prior to ground-disturbing activities	Condition of Design/Build Contract CDFW
	Bio-MM#58: Prepare and Implement a Habitat Mitigation and Monitoring Plan. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Contractor and Authority Monitoring/Reporting Party: Contractor and Authority 1. For off-site and compensatory mitigation activities, the Authority will be responsible for the production of that specific HMMP and implementation, monitoring and reporting against it 2. Any modifications of mitigation ratios will require consultation and agreement with Authority 3. Annual monitoring reports will be produced by the	X	X	X	X	Annual monitoring reports for 5 years (or less if success criteria are met as described earlier) and/or other documentation prescribed in the resource agency permits.	Documentation Reports demonstrating compliance with HMMP

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
		Contractor for its scope of work until substantial completion of the work at which time the Authority shall assume responsibility for production or assign the responsibility to other contractors. <i>Rev1</i>						
	Bio-MM#59: Compensate for Permanent Impacts on Jurisdictional Waters. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Authority to compensate based on area of permanent jurisdictional waters impacted by the Contractor Monitoring/Reporting Party: Authority <i>Rev1</i>	X	X	X		Prior to Operations	Documentation of compliance with permit conditions
	Bio-MM#60: Offsite Habitat Restoration, Enhancement and Preservation. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Authority to implement offsite mitigation based on effects from the physical alteration of onsite biological resources by the Contractor Monitoring/Reporting Party: Authority The Contractor shall monitor any activities and prepare any reports required where its construction activities contribute to the requirement for this mitigation measure <i>Rev1</i>	X	X	X		Pre-Construction, Construction, Post-Construction	Offsite habitat restoration, enhancement, and preservation program will be designed, implemented, and monitored consistent with the terms and conditions of the USACE Section 404 Permit, CDFW 1600 Streambed Alteration Agreement, and CESA and federal ESA as they apply to their jurisdiction and resources onsite
	Bio-MM#4: Prepare and Implement a Weed Control Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction/monthly memorandum to document the progress of the Weed Control Plan and implementation	Condition of Design/Build Contract CDFW
Bio#34: Project period impacts from the HST alternatives would permanently convert suitable habitat that has the potential to support American badger dens.	Bio-MM#14: Post-Construction Compliance Reports. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor and Authority Each Contractor will submit a Post-Construction Compliance Report at substantial contract completion for its own scope of work. The Authority will aggregate all reports and continue post-construction compliance reporting as required. <i>Rev1</i>			X		Post-construction	Memorandum documenting compliance
	Bio-MM#47: Install Wildlife Fencing Prior to operation of the HST, the Contractor will install free-ranging mammal-proof fencing along portions of the proposed project consistent with final design. The Contractor will verify that the installation is consistent with the designated terms and conditions in the applicable permits. The Contractor will prepare and submit a memorandum to the Authority documenting compliance. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X	X		Post-construction	Memorandum documenting compliance
	Bio-MM#48: Construction in Wildlife Movement Corridors. Before ground-disturbing activities, the Contractor will submit a construction avoidance and minimization plan for the Eastman Lake-Bear Creek ECA to the Authority for concurrence. During ground-disturbing activities, the Contractor will keep the Eastman Lake-Bear Creek ECA riparian corridors (including Deadman and	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Post-construction	Memorandum documenting compliance

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	Dutchman creeks) free of all equipment, storage materials, construction materials, and any significant potential impediments. The Contractor will minimize ground-disturbing activities within the Eastman Lake-Bear Creek ECA riparian corridors (Deadman and Dutchman creeks) during nighttime hours to the extent practicable. In addition, keep nighttime illumination (e.g., for security) from spilling into the ECA or shield nighttime lighting to avoid illumination spilling into the ECA. Inspections by the Authority will check compliance and the Contractor will prepare and submit memorandum to the Authority to document compliance. <i>Rev1</i>							
	Bio-MM#57: Conduct Delineation of Jurisdictional Waters and State Streambeds. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Prior to ground-disturbing activities	Condition of Design/Build Contract
	Bio-MM#58: Prepare and Implement a Habitat Mitigation and Monitoring Plan. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Contractor and Authority Monitoring/Reporting Party: Contractor and Authority 1. For off-site and compensatory mitigation activities, the Authority will be responsible for the production of that specific HMMP and implementation, monitoring and reporting against it 2. Any modifications of mitigation ratios will require consultation and agreement with Authority 3. Annual monitoring reports will be produced by the Contractor for its scope of work until substantial completion of the work at which time the Authority shall assume responsibility for production or assign the responsibility to other contractors. <i>Rev1</i>	X	X	X	X	Annual monitoring reports for 5 years (or less if success criteria are met as described earlier) and/or other documentation prescribed in the resource agency permits.	Documentation Reports demonstrating compliance with HMMP
	Bio-MM#59: Compensate for Permanent Impacts on Jurisdictional Waters. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Authority to compensate based on area of permanent jurisdictional waters impacted by the Contractor Monitoring/Reporting Party: Authority <i>Rev1</i>	X	X	X		Prior to Operations	Documentation of compliance with permit conditions
	Bio-MM#60: Offsite Habitat Restoration, Enhancement and Preservation. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Authority to implement offsite mitigation based on effects from the physical alteration of onsite biological resources by the Contractor Monitoring/Reporting Party: Authority The Contractor shall monitor any activities and prepare any reports required where its construction activities contribute to the requirement for this mitigation measure <i>Rev1</i>	X	X	X		Pre-Construction, Construction, Post-Construction	Offsite habitat restoration, enhancement, and preservation program will be designed, implemented, and monitored consistent with the terms and conditions of the USACE Section 404 Permit, CDFW 1600 Streambed Alteration Agreement, and CESA and federal ESA as they apply to their jurisdiction and resources onsite

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	Bio-MM#4: Prepare and Implement a Weed Control Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction/monthly memorandum to document the progress of the Weed Control Plan and implementation	Condition of Design/Build Contract CDFW
Bio#35: Project period impacts from the HST alternatives would permanently convert suitable habitat that has the potential to support San Joaquin kit fox dens.	Bio-MM#14: Post-Construction Compliance Reports. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor and Authority Each Contractor will submit a Post-Construction Compliance Report at substantial contract completion for its own scope of work. The Authority will aggregate all reports and continue post-construction compliance reporting as required. <i>Rev1</i>			X		Post-construction	Condition of Design/Build Contract
	Bio-MM#47: Install Wildlife Fencing. See description above in Impact Bio#34: Project period impacts from the HST would permanently convert suitable habitat that has the potential to support American badger dens.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>			X		Post-construction	Condition of Design/Build Contract
	Bio-MM#48: Construction in Wildlife Movement Corridors. See description above in Impact Bio#34: Project period impacts from the HST would permanently convert suitable habitat that has the potential to support American badger dens.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Pre-construction and during construction	Condition of Design/Build Contract
	Bio-MM#56: Compensate for Destruction of Natal Dens. The Authority will mitigate the destruction of kit fox natal dens by the purchase of suitable, approved habitat (USFWS and CDFW). Replace habitat at a minimum of 1:1 acre of habitat in order to provide additional protection and habitat in a location consistent with the recovery of the species. Mitigate the impacts on San Joaquin kit fox in accordance with the USFWS Biological Opinion and/or CDFW 2081(b). The Authority will document compliance. <i>Rev1</i>	Implementing Party: Authority to compensate based on area of kit fox natural den habit impacted by the Contractor Monitoring/Reporting Party: Authority <i>Rev1</i>			X		Prior to Operations	Memorandum documenting compliance with BO and 2081 Determination
	Bio-MM#57: Conduct Delineation of Jurisdictional Waters and State Streambeds. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Prior to ground-disturbing activities	Condition of Design/Build Contract
	Bio-MM#58: Prepare and Implement a Habitat Mitigation and Monitoring Plan. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Contractor and Authority Monitoring/Reporting Party: Contractor and Authority 1. For off-site and compensatory mitigation activities, the Authority will be responsible for the production of that specific HMMP and implementation, monitoring and reporting against it 2. Any modifications of mitigation ratios will require consultation and agreement with Authority 3. Annual monitoring reports will be produced by the Contractor for its scope of work until substantial	X	X	X	X	Annual monitoring reports for 5 years (or less if success criteria are met as described earlier) and/or other documentation prescribed in the resource agency permits.	Documentation Reports demonstrating compliance with HMMP

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
		completion of the work at which time the Authority shall assume responsibility for production or assign the responsibility to other contractors. <i>Rev1</i>						
	Bio-MM#59: Compensate for Permanent Impacts on Jurisdictional Waters. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Authority to compensate based on area of permanent jurisdictional waters impacted by the Contractor Monitoring/Reporting Party: Authority <i>Rev1</i>	X	X	X		Prior to Operations	Documentation of compliance with permit conditions
	Bio-MM#60: Offsite Habitat Restoration, Enhancement and Preservation. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Authority to implement offsite mitigation based on effects from the physical alteration of onsite biological resources by the Contractor Monitoring/Reporting Party: Authority The Contractor shall monitor any activities and prepare any reports required where its construction activities contribute to the requirement for this mitigation measure <i>Rev1</i>	X	X	X		Pre-Construction, Construction, Post-Construction	Offsite habitat restoration, enhancement, and preservation program will be designed, implemented, and monitored consistent with the terms and conditions of the USACE Section 404 Permit, CDFW 1600 Streambed Alteration Agreement, and CESA and federal ESA as they apply to their jurisdiction and resources onsite
	Bio-MM#4: Prepare and Implement a Weed Control Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction/monthly memorandum to document the progress of the Weed Control Plan and implementation	Condition of Design/Build Contract CDFW
Bio#36: Project period impacts from the HST alternatives would permanently convert special-status plant communities (Great Valley Mixed Riparian and other riparian addressed in Bio#22).	Bio-MM#14: Post-Construction Compliance Reports. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor and Authority Each Contractor will submit a Post-Construction Compliance Report at substantial contract completion for its own scope of work. The Authority will aggregate all reports and continue post-construction compliance reporting as required. <i>Rev1</i>			X		Post-construction	Condition of Design/Build Contract
	Bio-MM#49: Compensate for Permanent Riparian Impacts. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Authority to compensate based on area of permanent riparian habitat impacted by the Contractor Monitoring/Reporting Party: Authority <i>Rev1</i>			X		Prior to Operations	Post-construction compliance reports consistent with the appropriate agency-issued permits
	Bio-MM#51: Implement Conservation Guidelines During the Project Period for Valley Elderberry Longhorn Beetle. See description above in Impact Bio#23: Project period impacts from the HST would permanently convert suitable habitat that has potential to support special-status plant species.	Implementing Party: Authority to compensate based on area of Valley Elderberry Longhorn Beetle habitat impacted by the Contractor Monitoring/Reporting Party: Authority The Contractor shall monitor any activities and prepare any reports required where its construction activities contribute to the requirement for this mitigation measure			X		Prior to Operations	Memorandum documenting compliance

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
		<i>Rev1</i>						
	<p>Bio-MM#57: Conduct Delineation of Jurisdictional Waters and State Streambeds. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X				Prior to ground-disturbing activities	Condition of Design/Build Contract
	<p>Bio-MM#58: Prepare and Implement a Habitat Mitigation and Monitoring Plan. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).</p>	<p>Implementing Party: Contractor and Authority Monitoring/Reporting Party: Contractor and Authority</p> <ol style="list-style-type: none"> For off-site and compensatory mitigation activities, the Authority will be responsible for the production of that specific HMMP and implementation, monitoring and reporting against it Any modifications of mitigation ratios will require consultation and agreement with Authority Annual monitoring reports will be produced by the Contractor for its scope of work until substantial completion of the work at which time the Authority shall assume responsibility for production or assign the responsibility to other contractors. <p><i>Rev1</i></p>	X	X	X	X	Annual monitoring reports for 5 years (or less if success criteria are met as described earlier) and/or other documentation prescribed in the resource agency permits.	Documentation Reports demonstrating compliance with HMMP
	<p>Bio-MM#59: Compensate for Permanent Impacts on Jurisdictional Waters. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).</p>	<p>Implementing Party: Authority to compensate based on area of permanent jurisdictional waters impacted by the Contractor Monitoring/Reporting Party: Authority <i>Rev1</i></p>	X	X	X		Prior to Operations	Documentation of compliance with permit conditions
	<p>Bio-MM#60: Offsite Habitat Restoration, Enhancement and Preservation. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).</p>	<p>Implementing Party: Authority to implement offsite mitigation based on effects from the physical alteration of onsite biological resources by the Contractor Monitoring/Reporting Party: Authority The Contractor shall monitor any activities and prepare any reports required where its construction activities contribute to the requirement for this mitigation measure <i>Rev1</i></p>	X	X	X		Pre-Construction, Construction, Post-Construction	Offsite habitat restoration, enhancement, and preservation program will be designed, implemented, and monitored consistent with the terms and conditions of the USACE Section 404 Permit, CDFW 1600 Streambed Alteration Agreement, and CESA and federal ESA as they apply to their jurisdiction and resources onsite
	<p>Bio-MM#4: Prepare and Implement a Weed Control Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds.</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X	X			Prior to construction/monthly memorandum to document the progress of the Weed Control Plan and implementation	Condition of Design/Build Contract CDFW

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
Bio#37: Project period impacts from the HST alternatives would permanently convert jurisdictional waters.	Bio-MM#4: Prepare and Implement a Weed Control Plan. See description above in Impact Bio#1: Introduction of Noxious Weeds. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Prior to construction/monthly memorandum to document the progress of the Weed Control Plan and implementation	Condition of Design/Build Contract
	Bio-MM#14: Post-Construction Compliance Reports. See description above in Impact Bio#3: Construction of the HST would disturb suitable habitat that has potential to support special-status plant species.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor and Authority Each Contractor will submit a Post-Construction Compliance Report at substantial contract completion for its own scope of work. The Authority will aggregate all reports and continue post-construction compliance reporting as required. <i>Rev1</i>			X		Post-construction	Condition of Design/Build Contract
	Bio-MM#57: Conduct Delineation of Jurisdictional Waters and State Streambeds. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Prior to ground-disturbing activities	Condition of Design/Build Contract
	Bio-MM#58: Prepare and Implement a Habitat Mitigation and Monitoring Plan. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Contractor and Authority Monitoring/Reporting Party: Contractor and Authority 1. For off-site and compensatory mitigation activities, the Authority will be responsible for the production of that specific HMMP and implementation, monitoring and reporting against it 2. Any modifications of mitigation ratios will require consultation and agreement with Authority 3. Annual monitoring reports will be produced by the Contractor for its scope of work until substantial completion of the work at which time the Authority shall assume responsibility for production or assign the responsibility to other contractors. <i>Rev1</i>	X	X	X	X	Annual monitoring reports for 5 years (or less if success criteria are met as described earlier) and/or other documentation prescribed in the resource agency permits.	Documentation Reports demonstrating compliance with HMMP
	Bio-MM#59: Compensate for Permanent Impacts on Jurisdictional Waters. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Authority to compensate based on area of permanent jurisdictional waters impacted by the Contractor Monitoring/Reporting Party: Authority <i>Rev1</i>	X	X	X		Prior to Operations	Documentation of compliance with permit conditions
	Bio-MM#60: Offsite Habitat Restoration, Enhancement and Preservation. See description above in Impact Bio#22: Project period impacts from the HST would permanently convert Great Valley mixed riparian forest and other riparian habitat (Coastal and Valley Freshwater Marsh and vernal pools addressed in BIO IMPACT #16).	Implementing Party: Authority to implement offsite mitigation based on effects from the physical alteration of onsite biological resources by the Contractor Monitoring/Reporting Party: Authority The Contractor shall monitor any activities and prepare any reports required where its construction activities contribute to the requirement for this mitigation measure	X	X	X		Pre-Construction, Construction, Post-Construction	Offsite habitat restoration, enhancement, and preservation program will be designed, implemented, and monitored consistent with the terms and conditions of the USACE Section 404 Permit, CDFW 1600 Streambed

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
		<i>Rev1</i>						Alteration Agreement, and CESA and federal ESA as they apply to their jurisdiction and resources onsite
	<p>PK-MM#1: Compensate for Staging in Park Property for Construction. The Authority will coordinate with the respective jurisdictions to establish appropriate compensation in terms of allowance or additional property to accommodate for displaced park use during construction. Options will include preparing a plan for alternative public recreation resources during the period of closure, and preparing signs and newsletters describing the project, its schedule, and the alternative public recreational opportunities. Alternative parks and recreational resources will include the installation of recreational facilities, trails, and landscaping on lands currently owned by the city but not already developed, or it will include temporary park development on open lands until the park can be reopened. Landscaping replacement will include replacement grass areas, tree replacement on a ratio of two 5-inch caliber trees for every tree removed and two shrubs for every shrub removed. All other facilities will be replaced or moved on a one-for-one ratio, including play equipment, benches, and the like.</p> <p><i>Rev1</i></p>	<p>Implementing Party: Authority to implement park property mitigation based on displaced park use by the Contractor Monitoring/Reporting Party: Authority The Contractor shall monitor any activities and prepare any reports required where its construction activities contribute to the requirement for this mitigation measure</p> <p><i>Rev1</i></p>	X	X	X		Prior to construction/Post construction. Authority to coordinate with local jurisdictions.	The Authority and contractor will work with respective jurisdictions to develop a staging plan. CDFW
Bio#40: All of the HST alternatives would affect Camp Pashayan (within the San Joaquin River Ecological Reserve).	<p>Bio-MM#30: Conduct Pre-Construction Surveys and Delineate Active Nest Exclusion Areas For Other Breeding Birds. In the event active bird nests are encountered during the pre-construction survey, the Contractor will determine the nest avoidance buffer zones as appropriate. The Contractor will establish the suitable buffers consistent with the intent of the MBTA. The Contractor will delineate nest avoidance buffers established for ground nesting birds in a manner that does not create predatory bird perch points in close proximity (150 feet) to the active nest site. The Contractor will monitor active bird nests weekly or more frequently pending status of nest and status of fledgling development. The Contractor will maintain the nest avoidance buffer zone until nestlings have fledged or the nest is abandoned. The Contractor will submit a memorandum to the Authority documenting compliance.</p> <p><i>Rev1</i></p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor</p> <p><i>Rev1</i></p>	X				Pre-construction surveys and during construction	Condition of Design/Build Contract
	<p>Bio-MM#31: Raptor Protection on Power Lines. See description above in Impact Bio#10: Construction of the HST would disturb nesting Swainson's hawk.</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor</p> <p><i>Rev1</i></p>	X				Final design, completed prior to construction.	Condition of Design/Build Contract
NMFS Biological Opinion Measures								
NMFS#1 Bridge Construction would negatively impact special status anadromous fish populations and their	<p>NMFS-MM#1: Conduct Pre Construction Snorkel Surveys. Pre-construction fish surveys (snorkel surveys following CDFW Salmonid Restoration Manual techniques) will be conducted by qualified fisheries biologist to determine the presence and density of salmonids utilizing the Resource Study Area (RSA).</p> <p>During construction a qualified fisheries biologist with experience in snorkel</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor</p> <p><i>Rev1</i></p>	X				Prior to bridge construction or ground disturbing activities affecting the buffer area under the jurisdiction of NMFS	Condition of Design/Build Contract and Condition of NMFS Biological Opinion

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing					Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations			
migration(s)	surveys and salmonid identification will be conducting fish presence surveys immediately prior to any in-water work (e.g. installation of temporary sheet piles to isolate work area) and surveys will be conducted again if there is a multi-day pause or lapse in construction activities.								
NMFS#2 Dewatering of the San Joaquin River will cause mortality to fish stocks, including special status anadromous fish	NMFS-MM#2 Prepare a Fish Rescue Plan. Implement Fish Rescue Plan to minimize fish stranding and mortality inside the cofferdam that will be dewatered for bridge construction. The contractor's fishery will develop and implement a fish rescue plan acceptable to the CDFW, USFWS, and NMFS.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Prior to bridge construction or ground disturbing activities affecting the buffer area under the jurisdiction of NMFS	Condition of Design/Build Contract and Condition of NMFS Biological Opinion	
	NMFS-MM#3: Conduct Fish Relocation and Monitoring During and After Dewatering. The contractor will ensure that a qualified fisheries biologist with a current CDFW collection permit conducts the fish rescue and relocation efforts behind the cofferdam. The fish rescue effort will be implemented during the dewatering of the areas behind the cofferdam(s) and involve capture and return of those fish to suitable habitat within the adjacent waterways. The area will first be seined, followed by electrofishing to remove fish that are behind the cofferdam. A fisheries biologist will be on-site during initial pumping (dewatering) to ensure compliance with the plan.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			During bridge construction	NMFS-MM#3: Conduct Fish Relocation and Monitoring During and After Dewatering. The contractor will ensure that a qualified fisheries biologist with a current CDFW collection permit conducts the fish rescue and relocation efforts behind the cofferdam. The fish rescue effort will be implemented during the dewatering of the areas behind the cofferdam(s) and involve capture and return of those fish to suitable habitat within the adjacent waterways. The area will first be seined, followed by electrofishing to remove fish that are behind the cofferdam. A fisheries biologist will be on-site during initial pumping (dewatering) to ensure compliance with the plan.	
Hydrology and Water Resources									
No significant impacts on hydrology and water resources have been identified.									
Geology, Soils, and Seismicity									
With implementation of standard engineering design measures and BMPs, impacts for elevated structures, retained cuts, retained fills, and at-grade segments of each alternative would be less than significant. Therefore, mitigation measures are not required.									
Hazardous Materials and Wastes									
HMW#1: Handling of Extremely Hazardous Materials within 0.25 mile of a School	HMW-MM#1: Limit use of extremely hazardous materials near schools. The contractor shall not handle an extremely hazardous substance (as defined in California Public Resources Code Section 21151.4) or a mixture containing extremely hazardous substances in a quantity equal to or greater than the state threshold quantity specified pursuant to subdivision (j) of Section 25532 of the Health and Safety Code within 0.25 mile of a school. Signage would be used to delimit all work areas within 0.25 mile of a school	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>		X			Construction/Monthly reporting	Contract Requirements/Specifications	

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	and the contractor would be required to monitor all use of extremely hazardous substances.							
Station Planning, Land Use, and Development								
No impacts on land use have been identified that would be significant under NEPA. All three alternatives and the HMF sites are consistent with local and regional land use plans, policies, and regulations adopted for the purpose of avoiding or mitigating an environmental effect. The alternatives and the HMF sites would not cause significant changes in land use patterns or intensities that would be incompatible with adjacent land uses. Station effects related to increased density and TOD are considered beneficial and would result in infill development and redevelopment of the downtown centers, which would reduce pressures on the surrounding agricultural lands.								
Agricultural Lands								
Ag#1: Permanent Conversion of Agricultural Land to Nonagricultural Use.	Ag-MM#1: Preserve the Total Amount of Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland. The Authority will enter into an agreement with the DOC California Farmland Conservancy Program to implement the preservation of farmland. The Authority will fund the California Farmland Conservancy Program's work to identify suitable agricultural land for mitigation of impacts and to 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 as the impacts occur, at a replacement ratio of not less than 1:1. The California Farmland Conservancy Program will work with local, regional, or statewide entities whose purpose includes the acquisition and stewardship of agricultural conservation easements. The Authority and California Farmland Conservancy Program will develop selection criteria under this agreement to guide the pursuit and purchase of conservation easements. These will include, but are not limited to, provisions to ensure that the easements will conform to the requirements of Public Resources Code Section 10252 and to prioritize the acquisition of willing seller easements on lands that are adjacent to other protected agricultural lands or that would support the establishment of greenbelts and urban separators. This mitigation measure would be effective given the nationwide and local success of farmland preservation programs using agricultural conservation easements and the experience of the DOC California Farmland Conservancy program. However, because the mitigation does not anticipate the creation of new farmland (conversion of natural lands to agriculture), the Authority and FRA are not claiming that the mitigation measure would reduce impacts to a less than significant level.	Implementing Party: Authority & California Farmland Conservancy Monitoring/Reporting Party: Authority	X				Prior to construction/Monthly reporting Prior to construction	The Authority will enter into an agreement with the DOC California Farmland Conservancy Program to implement the preservation of farmland. The Authority and California Farmland Conservancy Program will develop selection criteria under this agreement to guide the pursuit and purchase of conservation easements.
Electromagnetic Fields and Electromagnetic Interference								
The project would comply with applicable federal and state regulations and implement design strategies as outlined in the Final Statewide Program EIR/EIS (Authority and FRA 2005). No significant impacts would occur during construction nor operation of the Project Alternatives or HMFs.								
Parks, Recreation, and Open Space								
PK#4: Camp Pashayan (City of Fresno) Construction Impacts	PK-MM#1: Compensate for Staging in Park Property for Construction. The Authority will coordinate with the respective jurisdictions to establish appropriate compensation in terms of allowance or additional property to accommodate for displaced park use during construction. This will include screening stockpiled material and construction excavations through the use of temporary construction barriers and other screens, where they are exposed to	Implementing Party: Authority to implement park property mitigation based on displaced park use by the Contractor Monitoring/Reporting Party: Authority The Contractor shall monitor any activities and prepare any reports required where its construction activities contribute to	X	X	X		Prior to construction/Post construction. Authority to coordinate with local jurisdictions.	The Authority and contractor will work with respective jurisdictions to develop a staging plan.

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing					Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations			
	<p>park users; and restoring affected portions of the property after construction and use native plant materials for revegetation where appropriate. The temporary impacts will be restored in place, to its natural state before construction. This restoration plan will be developed and described in the work plan prepared by the contractor and approved by CDFW. The construction would be coordinated activities to avoid scheduled weekend activities, when appropriate. For example, existing access entry points to Camp Pashayan will remain open during construction, since project construction would occur along the southern boundary of the property and vehicle/bicycle/pedestrian access entry points are well north of the construction zone; visitors would continue to be able to access Camp Pashayan as they do currently. Only the southern end of Camp Pashayan in the construction zone would be access-restricted during construction. If any additional CDFW management and maintenance resources are needed to accommodate the work, such as use of public restrooms, or on-site assistance, there will be compensation for those resources.</p> <p>Construction activities would be coordinated with the CDFW to plan for using the area under the elevated tracks as available Ecological Reserve land, contingent upon consistency with the Authority's policy on air-rights with restrictions related to HST operations and maintenance, as well as approval/acceptance by FRA Office of Safety and the Department of Homeland Security.</p>	the requirement for this mitigation measure <i>Rev1</i>							
PK#7: Acquisition of Camp Pashayan Park Property. At Camp Pashayan, 0.6 acre of park area would be acquired for support columns and easement for elevated structure.	PK-MM#4: Acquire Park Property for Camp Pashayan. Final design will continue to seek to minimize right-of-way impacts and pier placement in Camp Pashayan. Mitigation will include in-lieu fee for property impacts associated with pier installation as well as revegetation of disturbed areas with native plantings (consistent with CDFW vegetation/landscaping plans for the reserve).	Implementing Party: Contractor and Authority Monitoring/Reporting Party: Contractor in coordination with the Authority <i>Rev1</i>	X				Prior to construction/monthly reporting	The Authority will work with the California Department of Fish and Game to prepare and execute an agreement to acquire the property.	
PK#8: Noise Impacts at Roeding Park (City of Fresno)	PK-MM#5: Address Noise at Roeding Park with City of Fresno. To mitigate the noise impacts, a sound barrier approximately 2,800 feet in length will be constructed. It is assumed that a sound barrier will be 10 to 14 feet tall and have aesthetic treatment. A 10-foot-high sound barrier will reduce noise to 64 dBA at 250 feet inside the park and residual noise effects will occur. A 14-foot-high sound barrier will reduce noise effects to within 1 dB of no impact. The sound barrier will result in visual effects, but would not change the existing visual quality. The visual character of the eastern part of the park will change as one moves closer to the edge of the park. The landscape character at the park's edge will change with the presence and build of the sound barrier compared to the existing chain link fence, flat roadway, and open views. However, the sound barrier, with aesthetic treatment of shrubs located along the park side of the wall, will improve the park's visual quality and setting by blocking views of the existing transportation facilities outside the park's visual quality and setting by blocking views of the existing transportation facilities outside the park that detract from its setting. Aesthetic treatment of the sound barrier will be selected with input from the community. The mitigation	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Design and Construction	The Authority will work with the City of Fresno as the resource owner to address noise impacts. It is possible that the City of Fresno would view the projected noise levels as acceptable and preferable to the implementation of mitigation measures.	

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	measure will be further refined in consultation with the owners and maintenance keepers of the park and recreational facilities. <i>Rev1</i>							
Aesthetics and Visual Resources								
During final design of elevated guideways and the Merced and Fresno stations, the Authority will coordinate with local jurisdictions on the design of these facilities so that they are designed appropriately to fit in with the visual context of the areas near them.	<p>VQ-MM#3: Incorporate Design Criteria for Elevated and Station Elements That Can Adapt to Local Context. During final design of elevated guideways and the Merced and Fresno stations, the Authority will coordinate with local jurisdictions on the design of these facilities so that they are designed appropriately to fit in with the visual context of the areas near them. This will include the following activities:</p> <ul style="list-style-type: none"> For stations: During the station design process, establish a local consultation process with the City of Merced and the City of Fresno to identify and integrate local design features into the station design through a collaborative context-sensitive solutions approach. The process will include activities to solicit community input in their respective station areas. This effort will be coordinated with the station area planning process that will be undertaken by those cities under their station area planning grants. For elevated guideways in cities or unincorporated communities: During the elevated guideway design process, establish a process with the city or county with jurisdiction over the land along the elevated guideway to advance the final design through a collaborative context-sensitive solutions approach. Participants in the consultation process will meet on a regular basis to develop a consensus on the urban design elements to be incorporated into the final guideway designs. The process will include activities to solicit community input in the affected neighborhoods. <p>Actions taken to help achieve integration with the local design context during the context-sensitive solutions process will include the following:</p> <ul style="list-style-type: none"> Design HST stations and associated structures such as elevators, escalators, and walkways to be attractive architectural elements or features that add visual interest to the streetscapes near them. Design HST station parking structures and adjacent areas to integrate visually into the areas where they would be located. Where the city has adopted applicable downtown design guidelines, the parking structures and adjacent areas will be designed to be compatible with the policies and principles of those guidelines. For the elevated guideways and columns, incorporate architectural elements, such as graceful curved or tapered sculptural forms and decorative surfaces, to provide visual interest. Include decorative texture treatments on large-scale concrete surfaces such as parapets and other portions of elevated guideways. Include a variety of texture, shadow lines, and other surface articulation to add visual and thematic interest. Closely coordinate the design of guideway columns and parapets with station and platform architecture to promote unity and coherence where guideways lie adjacent to stations. Integrate trees and landscaping into the station streetscape and plaza plans where possible to soften and buffer the appearance of guideways, columns, and elevated stations. This will be consistent with the principles of crime 	<p>Implementing Party: Contractor Monitoring/Reporting Party: Mitigation Manager to review plans to verify compliance with measure.</p>	X				Final design and Construction/Monthly reporting	Established local consultation process with City of Merced and City of Fresno

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	prevention through environmental design. For the stations, structures, and related open spaces: incorporate design features that provide interest and reflect the local design context. These features could include landscaping, lighting, and public art.							
	VQ-MM#3a: Integrate the Elevated Guideways with Affected City Parks, Trails, and Urban Core Design Guidelines. During development of the final design, the Authority will work with the affected cities and counties to develop a project site and landscape design plan for the areas disturbed by the project. As a result of following these plans, the design features identified in VQ-MM#3 and the park mitigation measure PK-MM#3 will be implemented.	Implementing Party: Contractor Monitoring/Reporting Party: Mitigation Manager to review plans to verify compliance with measure.	X	X			Final design and Construction/Monthly reporting	Established local consultation process with City of Merced and City of Fresno
	VQ-MM#3b: Screen Elevated Guideways Adjacent to Residential Areas. Consistent with the design features developed under VQ-MM#3, the Authority will plant trees along the edges of the rights-of way in locations adjacent to residential areas. This will help reduce the visual contrast between the elevated guideway and the residential area. The species of trees to be installed will be selected on the basis of their mature size and shape, growth rate, hardiness, and drought tolerance. No species that is listed on the Invasive Species Council of California's list of invasive species will be planted. The crowns of trees used should ultimately be tall enough so that upon maturity they will partially, or fully, block or screen views of the elevated guideway from adjacent at-grade areas. Trees should allow ground-level views under the crowns (with pruning if necessary) while not interfering with the 15-foot clearance requirement for the guideway. The trees will be continuously maintained and appropriate irrigation systems will be installed within the tree planting areas. Invasive Species Council of California's list of invasive species will be planted. The landscaped areas will be continuously maintained and appropriate irrigation systems will be installed.	Implementing Party: Contractor Monitoring/Reporting Party: Mitigation Manager to review plans to verify compliance with measure.	X	X			Final design and Construction/Monthly reporting	Established local consultation process with City of Merced and City of Fresno
VQ #11. Sound Barrier and Retaining Wall Would Block Views.	VQ-MM#5: Provide Landscape Treatments along the HST Project Overcrossings and Retained Fill Elements of the HST. Upon the completion of construction, the Authority will plant the surface of the ground supporting the overpasses (slope-fill overpasses) and retained fill elements with vegetation consistent with the surrounding landscape in terms of vegetative type, color, texture, and form. During final design, the Authority will consult with the affected cities and counties regarding the landscaping program for planting the slopes of the overcrossings and retained fill. Plant species will be selected on the basis of their mature size and shape, growth rate, and drought tolerance. No species that is listed on the Invasive Species Council of California's list of invasive species will be planted. The landscaping will be continuously maintained and appropriate irrigation systems will be installed, if needed. Where wall structures supporting the overpasses or retained fill are proposed, the structure will employ architectural details and low-maintenance trees and other vegetation to screen the structure, minimize graffiti, and reduce the effects of large walls. Surface coatings will be applied on wood and concrete to facilitate cleaning and the removal of graffiti. Any graffiti or visual defacement or damage of fencing and walls will be painted over or repaired within a reasonable time after notification.	Implementing Party: Contractor/Authority Monitoring/Reporting Party: Mitigation Manager to review plans to verify compliance with measure.			X		Pre and Post Construction/monthly reporting	Contract Requirements/ Specifications
	VQ-MM#6: Provide Sound Barrier Treatments. The Authority will design a	Implementing Party: Contractor		X			Construction/monthly	Contract Requirements/

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	<p>range of sound barrier treatments for visually sensitive areas, such as those where residential views of open landscaped areas would change or in urban areas where sound barriers would adversely affect the existing character and setting. The Authority will develop the treatments during final design and integrate them into the final project design. The treatments will include, but are not limited to, the following:</p> <ul style="list-style-type: none"> • Sound barriers along elevated guideways may incorporate transparent materials, where sensitive views would be adversely affected by solid sound barriers. • Sound barriers will use non-reflective materials and will be of a neutral color. • Surface design enhancements and vegetation appropriate to the visual context of the area will be installed with the sound barriers. Vegetation will be installed consistent with the provisions of VQ-MM#5. Surface enhancements will be consistent with the design features and will include architectural elements (i.e. stamped pattern, surface articulation, and decorative texture treatment as determined acceptable to the local jurisdiction. Surface coatings will be used on wood and concrete sound barriers to facilitate cleaning and the removal of graffiti. 	<p>Monitoring/Reporting Party: Mitigation Manager to review construction plans to verify compliance with this measure.</p>					reporting	Specifications
	<p>VQ-MM#7: Screen Traction Power Distribution Station. Upon completion of station construction, the Authority will screen the traction power substations (located at approximately 30-mile intervals along any of the HST alternatives) from public view through the use of landscaping or solid walls/fences. This will consist of context-appropriate landscaping of a type and scale that does not draw attention to the station. Plant species will be selected on the basis of their mature size and shape, growth rate, hardiness, and drought tolerance. No species that is listed on the Invasive Species Council of California’s list of invasive species will be planted. The landscaping will be continuously maintained and appropriate irrigation systems will be installed within the landscaped areas. Walls will be constructed of cinder-block or similar material and will be painted a neutral color to blend in with the surrounding context. If a chain-link or cyclone fence is used, it will include wood slats in the fencing. Any graffiti or visual defacement or damage of fencing and walls will be painted over or repaired within a reasonable period as agreed between the Authority and local jurisdiction.</p>	<p>Implementing Party: Contractor/Authority Monitoring/Reporting Party: Mitigation Manager to review construction plans to verify compliance with this measure.</p>			X		Post Construction	Contract Requirements/ Specifications
<p>VQ IMPACT #12. Traction Power Distribution Stations Would Alter Visual Character or Block Views.</p>	<p>VQ-MM#7: Screen Traction Power Distribution Station. Upon completion of station construction, the Authority will screen the traction power substations (located at approximately 30-mile intervals along any of the HST alternatives) from public view through the use of landscaping or solid walls/fences. This will consist of context-appropriate landscaping of a type and scale that does not draw attention to the station. Plant species will be selected on the basis of their mature size and shape, growth rate, hardiness, and drought tolerance. No species that is listed on the Invasive Species Council of California’s list of invasive species will be planted. The landscaping will be continuously maintained and appropriate irrigation systems will be installed within the landscaped areas. Walls will be constructed of cinder-block or similar material and will be painted a neutral color to blend in with the surrounding context. If a chain-link or cyclone fence is used, it will include wood slats in the fencing. Any graffiti or visual defacement or damage of fencing and walls will be painted over or repaired within a reasonable period as agreed between the Authority and local jurisdiction.</p>	<p>Implementing Party: Contractor/Authority Monitoring/Reporting Party: Mitigation Manager to review construction plans to verify compliance with this measure.</p>			X		Post Construction	Contract Requirements/ Specifications

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
Cultural and Paleontological Resources								
Archaeological Resources								
Arch#1: Effect on Significant Prehistoric and Historic-Era Archaeological Resources During Construction	<p>Arch-MM#1: Conduct Archaeological Training. Prior to ground-disturbing activities within the project alternatives, a qualified professional archaeologist, who meets the Secretary of the Interior’s (SOI’s) Standards for Archaeology, will develop a training program and printed material to be presented to construction personnel. The purpose of this training and accompanying materials will be to familiarize construction personnel with the relevant legal (Section 106/NEPA/CEQA) context for cultural resources of the project and with the types of cultural sites, features, and artifacts that could be uncovered during construction activities. These training sessions will be conducted prior to commencing construction within discrete portions of the project alternatives or as needed as construction crews and supervisors may change. The archaeological training program is further detailed in the Archaeological Treatment Plan (ATP), which will focus on the treatment of known buried historic properties and will provide guidance in the event of unanticipated discoveries. This is being developed with input from all consulting parties, including:</p> <ul style="list-style-type: none"> • Merced County • City of Merced • City of Merced Design Review Board/Commission and Historic Preservation Commission • Fresno County • City of Fresno • City of Fresno Historic Preservation Program • Fresno County Landmarks and Records Advisory Commission • Madera County • City of Madera • California State Historic Preservation Office (SHPO) • Advisory Council on Historic Preservation (ACHP) <p>In addition, consultation is being undertaken with participating parties and entities that have expressed a formal interest in being involved with the project, including Native American tribes. The ATP will reflect the input of all parties. The ATP is a living document, monitored by all of the consulting parties so that compliance activities and mitigation commitments can be tracked. The ATP will be also be tied to the Memorandum of Agreement (MOA), which will also contain compliance and tracking stipulations tied to each specific mitigation item. The combination of the ATP and the MOA, along with ongoing coordination with the consulting parties, tracks and measures the commitments.</p> <p><i>Rev1</i></p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X				<p>Prior to ground-disturbing activities/weekly monitoring See below for Section 106 MOA Reporting Requirements</p>	<p>Worker Environmental Awareness Program training ATP MOA An Unanticipated Discoveries Plan is a part of the ATP and has been developed, in coordination with the consulting parties, to detail the specific procedures to be followed if archaeological materials are found during construction. Implement an ADRP if the circumstances warrant an ADRP. The Authority will provide the ADRP, as an element of the treatment plan prepared for the section, to the MOA signatories and MOA concurring parties for review and comment. Programmatic Agreement (PA)</p>
	<p>Arch-MM#2: Halt Work in the Event of an Archaeological Discovery. If any cultural resources are discovered during ground-disturbing activities, all work within 50 feet of the resources will halt, and the project proponent will consult with a qualified archaeologist to assess the significance of the find and any work may proceed on other parts of the project site while mitigation for historical</p>	<p>Implementing Party: Contractor, in consultation with the California State Lands Commission, the Native American Heritage Commission, and the State Historic Preservation Office, as appropriate.</p>		X			<p>Construction See below for Section 106 MOA Reporting Requirements</p>	<p>ATP MOA</p>

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing					Implementation Mechanism or Tool
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	<p>resources or unique archaeological resources is being carried out. An Unanticipated Discoveries Plan will be developed in coordination with the consulting parties to detail the specific procedures to be followed if archaeological materials are found during construction. This plan is a part of the ATP, which is also being developed through a consultative process.</p> <p>The California State Lands Commission (CSLC) will be notified if the find is a cultural resource on or in the submerged lands of California, consequently under the jurisdiction of the CSLC. The project proponent will comply with all applicable rules and regulations promulgated by CSLC with respect to cultural resources located in submerged lands, and in accordance with the Programmatic Agreement (PA) and the Memorandum of Agreement (MOA).</p> <p>If human remains are encountered, the project proponent will comply with applicable laws and regulations regarding notification and disposition of the remains. If the coroner determines that the remains are Native American, the coroner will notify the Native American Heritage Commission (NAHC).</p> <p>If any find is determined to be significant, the project proponent and the archaeologist will meet to determine the appropriate avoidance measures or other appropriate mitigation in conjunction with the State Historic Preservation Officer (SHPO) and the MOA signatories. All significant cultural materials recovered will be, as necessary and at the discretion of the consulting archaeologist, subject to scientific analysis, professional museum curation, and documentation according to current professional standards as determined in the MOA. In considering any suggested mitigation proposed by the consulting archaeologist to mitigate impacts on historical resources or unique archaeological resources, a determination will be made whether avoidance is necessary and feasible in light of factors such as the nature of the find, project design, costs, and other considerations.</p> <p>If, in consultation with the consulting archaeologist, it is determined that a significant archaeological resource is present and that the resource could be adversely affected by the proposed project, one of the following actions may be followed, as feasible:</p> <ul style="list-style-type: none"> • If prudent and feasible, redesign the project to avoid any adverse effect on the significant archaeological resource. • Implement Arch-MM#3, Intentional Site Burial for Site Preservation. • Implement an archaeological data recovery program (ADRP) (unless the archaeologist determines that the archaeological resource is of greater interpretive use than research significance and that interpretive use of the resource is feasible). If the circumstances warrant an ADRP, such a program will be conducted. Together with a project archaeologist, the scope of the ADRP will be determined. The archaeologist will prepare a draft ADRP, which will identify the scientific/historical research questions that are applicable to the expected resource, the data classes the resource is expected to possess, and how the expected data classes will address the applicable research questions. The Authority will provide the ADRP, as an element of the treatment plan prepared for the section, to the MOA signatories and MOA concurring parties for review and comment. Data recovery, in general, 	<p>Monitoring/Reporting Party: Contractor, in coordination with Authority, SHPO and appropriate consulting agencies</p> <p><i>Rev1</i></p>						

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing					Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations			
	<p>should be limited to the portions of the historical property that could be adversely affected by the proposed project. Destructive data recovery methods will not be applied to portions of the archaeological resources if nondestructive methods are practical.</p> <p>Performance tracking of this mitigation measure will be based upon successful implementation and approval of the documentation by the SHPO and appropriate consulting parties.</p>								
	<p>Arch-MM#3: Plan an Intentional Site Burial Preservation In-Place. If project engineering concludes that avoidance is not feasible, a process to determine whether the site can be preserved through intentional site burial will be considered. When complete avoidance is not possible, preservation in-place is the preferred form of mitigation for an "historical resource of an archaeological nature" because it retains the relationships between artifact and context, and may avoid conflicts with groups associated with the site, pursuant to CEQA Guidelines 15126.4(b)(3)(A). The process, presented in overview below, is specified in detail in the ATP, which is being developed in coordination with all of the project's consulting parties.</p> <p>To intentionally bury a site, it will be necessary to conduct test excavations to determine the vertical and horizontal extent of the identified resources discovered as planning proceeds or through accidental discovery. If excavations have not yet been conducted for the purpose of evaluating the site for eligibility in accordance with Section 106 of the NHPA, the Authority will contract with a qualified archaeologist to conduct a formal excavation of the site to delineate the site boundaries and to determine the site's eligibility for the CRHR or NRHP.</p> <p>If found to be eligible and avoidance is not possible, consideration will be given to intentional site burial. The contracted archaeologist will, in addition to the formal delineation of the site boundaries, prepare and implement a design plan to dictate the conditions of the intentional site burial according to the recommendations discussed in the National Park Service Technical Brief Number 5, Intentional Site Burial: A Technique to Protect Against National or Mechanical Loss (Thorne 1991).</p> <p>Among the requirements of an effective capping, the mechanical process of burying the site must be designed in a manner that will make sure that the site matrix is protected during the placement process and during the operation of the HST. Preconstruction testing can be used to determine the construction equipment and fill material load limits that are allowable without causing compression or warpage of the artifact and feature components of the site.</p> <p>If the preconstruction testing determines that compression or warpage of the site is probable and the mitigation will not effectively reduce the effects of the project to less than significant levels, additional mitigation, such as data recovery, will be necessary. Furthermore, if it is determined that the engineering requirements of the construction and operation of the HST at the location of the site prohibit the effective avoidance of the site, or if the surrounding conditions prohibit the protection or preservation of the archaeological components, the mitigation of data recovery will be the only feasible mitigation (see Arch-MM#2 above). In addition, the Authority will make provisions with the contracted archaeologist to monitor the site after the burial</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor, in coordination with the Authority, SHPO and appropriate consulting agencies Site burial monitoring reports will be produced by the Contractor for its scope of work until substantial completion of the work at which time the Authority shall assume responsibility for production or assign the responsibility to other contractors.</p> <p><i>Rev1</i></p>	X	X	X		<p>Prior to construction/Weekly reporting See below for Section 106 MOA Reporting Requirements</p>	<p>ATP MOA</p>	

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	<p>process is completed.</p> <p>Performance tracking of this mitigation measure will be based upon successful implementation and the approval of the documentation by the SHPO and appropriate consulting parties.</p> <p><i>Rev1</i></p>							
	<p>Arch-MM#4: Conduct Archaeological Monitoring in Proximity to Identified Sites or Areas of Sensitivity. Ground-disturbing activities that have the potential to affect archaeological remains may occur in areas that have been identified as either the location of a known archaeological site, or in an area known to be sensitive for the presence of buried cultural resources. The Authority will retain the services of a qualified archaeological monitor who will be present during all ground-disturbing construction activities occurring in native sediments/soils. The process for archaeological monitoring, presented in overview below, will be specified in detail in the ATP, developed in coordination with all of the project's consulting parties.</p> <p>In the event that cultural resources are exposed during construction, following guidelines presented in the ATP, the archaeological monitors will be empowered to temporarily halt activities in the immediate vicinity of the discovery while it is evaluated for significance. If the archaeologist determines that the cultural resources exposed are unique archaeological resources as defined by Section 21083.2 of CEQA, then the archaeologist will conduct additional excavations to avoid impacts on these resources by the development. If they are not "unique," then no further mitigation will be required. Unique cultural resources will be determined based on the criteria set forth in Section 21083.2 of CEQA. The Authority will seek Native American input and consultation under terms and conditions specified in the ATP and MOA.</p> <p>Performance tracking of this mitigation measure is based upon successful implementation and approval of the documentation by the SHPO and appropriate consulting parties.</p> <p><i>Rev1</i></p>	<p>Implementing Party: Contractor</p> <p>Monitoring/Reporting Party: Contractor, in coordination with the Authority, SHPO and appropriate consulting agencies</p> <p><i>Rev1</i></p>	X	X	X		<p>Construction/Weekly reporting</p> <p>See below for Section 106 MOA Reporting Requirements</p>	<p>ATP</p> <p>MOA</p>
Section 106 MOA Reporting Requirements								

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	See Description for Arch MM#1-4	Implementing Party: Contractor Monitoring/Reporting Party: Contractor, in coordination with the Authority, SHPO and appropriate consulting agencies <i>Rev1</i>	X	X	X		Monthly progress reports documenting the implementation of the ATP and BETP to be prepared by the implementing contractor, to the cultural resources point of contact at the Authority and FRA. Annual Report prepared by the Authority, in consultation with FRA, documenting the implementation of the MOA	ATP Section 106 MOA
Paleontological Resources								
Pale#2: Effect on Paleontological Resources during Construction	Pale-MM#1: Engage a Paleontological Resources Specialist to Direct Monitoring during Construction. At least 120 days prior to construction, a paleontological resources specialist (PRS) will be designated for the project and will be responsible for determining where and when paleontological resources monitoring should be conducted. Paleontological resources monitors (PRMs) will be selected by the PRS based on their qualifications, and the scope and nature of their monitoring will be determined and directed based on the Paleontological Resource Monitoring and Mitigation Plan (PRMMP). The PRS will be responsible for developing and implementing their portion of the Worker Environmental Awareness Program training. All management and supervisory personnel and construction workers involved with ground-disturbing activities will be required to take this training prior to beginning work on the project and will be provided with the necessary resources for response in case paleontological resources are found during construction. The PRS will document any discoveries, as needed, evaluate the potential resource, and assess the significance of the find under the criteria set forth in CEQA Guidelines Section 15064.5. <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Authority <i>Rev1</i>	X	X			Identify PRS at least 120 days prior to construction The PRS will document any discoveries, as needed, evaluate the potential resource, and assess the significance of the find.	Paleontological Resource Monitoring and Mitigation Plan (PRMMP)
	Pale-MM#2: Prepare and Implement a Paleontological Resource Monitoring and Mitigation Plan (PRMMP). Paleontological monitoring and mitigation measures are restricted to those construction-related activities that will result in the disturbance of paleontologically sensitive sediments. The PRMMP will include a description of when and where construction monitoring will be required; emergency discovery procedures; sampling and data recovery procedures; procedures for the preparation, identification, analysis, and curation of fossil specimens and data recovered; preconstruction coordination procedures; and procedures for reporting the results of the monitoring and mitigation program. In general, the monitoring program will reflect site-specific construction of the	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X			Construction	PRMMP Worker Environmental Awareness Program training

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	<p>selected option. The PRMMP will be consistent with Society of Vertebrate Paleontology guidelines (SVP 1995a,b) for the mitigation of construction-related impacts on paleontological resources. The PRMMP will also be consistent with the SVP (1996) conditions for receivership of paleontological collections and any specific requirements of the designated repository for any fossils collected.</p> <p><i>Rev1</i></p>							
	<p>Pale-MM#3: Halt Construction when Paleontological Resources Are Found. If fossil or fossil-bearing deposits are discovered during construction, regardless of the individual making a paleontological discovery, construction activity in the immediate vicinity of the discovery will cease. This requirement will be spelled out in both the PRMMP and the Worker Environmental Awareness Program. Construction activity may continue elsewhere provided that it continues to be monitored as appropriate. If the discovery is made by someone other than a PRM or the PRS, a PRM or the PRS will immediately be notified.</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor to halt construction and notify Authority of discovery.</p> <p><i>Rev1</i></p>	X	X			Construction/weekly reporting	A Built Environment Treatment Plan (BETP) provides additional detail on the methodology for the avoidance of adverse vibration effects, and how that will be implemented during the project.
Historic Architectural Resources								
<p>Hist#1: Effect on Historically Significant Built-Environment Resources During Construction</p>	<p>Hist-MM#1: Avoid Adverse Vibration Effects. The HST Project will develop construction methods to avoid indirect adverse effects or substantial adverse change to historic properties from vibration caused by construction activities. Vibration from impact pile-driving during construction could cause the physical destruction, damage, or alteration of historic properties or historical resources if the pile-driving is within 25 to 50 feet of the building. Because this impact pile-driving could cause adverse effects or substantial adverse changes, alternative construction methods causing less than 0.12 peak particle velocity of one inch per second (0.12 PPV in/sec) measured at the receptor would be developed for construction activities near historic properties or historical resources if they are determined to be extremely susceptible to vibration damage. If piling is more than 50 feet from buildings, or if alternative methods such as push piling or auger piling can be used, damage from construction vibration should not be an issue. Preconstruction surveys conducted at locations within 50 feet of piling would document existing condition of buildings in case there is an issue during or after construction. The mitigation measure described above is consistent with FRA's High-Speed Ground Transportation Noise and Vibration Impact Assessment (2005) for evaluation of noise and vibration impacts associated with HSTs.</p> <p>A BETP will be prepared that provides additional detail on the methodology for the avoidance of adverse vibration effects, and how that will be implemented during the project. The BETP is being developed in coordination with the project's consulting parties to verify that all parties have a role in the generation of this plan. Performance tracking of this mitigation measure is based upon successful implementation and the approval of the documentation by the SHPO and appropriate consulting parties.</p> <p><i>Rev1</i></p>	<p>Monitoring/Reporting Party: Contractor and Authority, in consultation with the SHPO and appropriate consulting agencies.</p> <p><i>Rev1</i></p>	X	X	X		Preconstruction surveys and Construction	BETP PA

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing					Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations	Implementation Schedule/ Reporting Schedule	
	<p>Hist-MM#2: Develop Protection and Stabilization Measures. The Built Environment Treatment Plan (BETP) will identify historic properties/historical resources that require protection and/or stabilization prior to the start of construction of the project. Properties subject to this mitigation activity include any that are physically affected, and/or relocated, and/or in close enough proximity to require protection. This mitigation will be used to confirm that adverse effects on historic properties/historical resources will be either avoided entirely, or minimized to the extent possible. This mitigation was developed in consultation with the SHPO and the MOA signatories, as required by the PA. Such measures will include, but will not be limited to, vibration monitoring of construction in the vicinity of historic properties; cordoning off of resources, such as traffic, equipment storage, and personnel, from construction activities; shielding of resources from dust or debris; and stabilization of buildings adjacent to construction. For buildings that are to be moved, such measures will include stabilization of buildings and structures before, during, and after relocation; protection of buildings and structures during temporary storage; and relocation at a new site and during subsequent rehabilitation. Moving buildings could result in minor impacts on air emissions from equipment and vehicles and minor effects on developed or undeveloped sites.</p> <p>Protection and stabilization measures proposed for impacted resources will be presented in more detail in the BETP, a plan that is being developed with critical input from all of the project's consulting parties. This mitigation measure is consistent with best practices within the professional historic preservation community and is commensurate with mitigation measures for similar scale transportation projects. Similar mitigation measures have proven to be effective in achieving the stewardship goals of Section 106 and CEQA review. Performance tracking of this mitigation measure is based upon successful implementation and the approval of the documentation by the SHPO and appropriate consulting parties.</p> <p><i>Rev1</i></p>	<p>Implementing Party: Contractor and Authority, in consultation with the landowner, land-owning agencies, SHPO, and the MOA signatories, as required by the Programmatic Agreement (PA).</p> <p>Monitoring/Reporting Party: Contractor and Authority, in consultation with the SHPO and appropriate consulting agencies</p>	X	X			Preconstruction surveys and Construction/weekly reporting	BETP PA Historic Structure Report (HSR) and the relocation plan
	<p>Hist-MM#3: Minimize Adverse Effects through Relocation of Historic Structures. The BETP will identify historic properties/historical resources that will be relocated to help avoid destruction and minimize the direct adverse effect of their physical damage or alteration. The plan for relocation and implementation of relocation will take place prior to construction. The relocation of the historic properties/historical resources will take into account the historic site and layout (i.e., the orientation of the buildings to the cardinal directions), as well as their potential re-use. All structures will be thoroughly recorded in a Historic Structure Report (HSR) (see below), and the relocation plan will provide for stabilization of the structures before, during, and after the move.</p> <p>The project's consulting parties provided input to develop the relocation of historic structures section of the BETP in an effort to provide a comprehensive and thorough approach that would best meet the needs of the parties as well as the resources. This mitigation measure is consistent with best practices within the professional historic preservation community and is commensurate with mitigation measures for similar scale transportation projects. Relocating historic structures has proven to be effective in achieving the stewardship goals of Section 106 and CEQA review. Performance tracking of this mitigation</p>	<p>Implementing Party: Contractor</p> <p>Monitoring/Reporting Party: Contractor and Authority, in consultation with the SHPO and appropriate consulting agencies</p> <p><i>Rev1</i></p>	X	X			Prior to construction/monthly reporting	BETP (current BETP does not specify any resources requiring mitigation; however, future amendments to the BETP may identify such resources) Photographs and nomination document

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	measure is based upon successful relocation of resources and the approval of the process by the SHPO and appropriate consulting parties. <i>Rev1</i>							
	Hist-MM#5: Prepare and Submit NRHP Nominations. The BETP will identify specific historic properties/historical resources for nomination to the NRHP Program of the National Park Service (NPS). Properties subject to this mitigation will be treated in consultation with the landowner, or land-owning agencies, and the Authority. Current photographs of the property used in the nomination(s) will be taken prior to the start of project construction. The nomination document may also use other current and/or historic images prepared as part of other mitigation activities. This mitigation measure is consistent with best practices within the professional historic preservation community and is commensurate with mitigation measures for similar scale transportation projects. Preparing and submitting NRHP nominations has proven to be effective in achieving the stewardship goals of Section 106 and CEQA review. Performance tracking of this mitigation measure is based upon successful implementation and approval of the documentation by the SHPO and appropriate consulting parties. <i>Rev1</i>	Implementing Party: Authority Monitoring/Reporting Party: Authority, in consultation with the SHPO and appropriate consulting agencies <i>Rev1</i>	X	X			Prior to construction/monthly reporting	BETP (current BETP does not specify any resources requiring mitigation; however, future amendments to the BETP may identify such resources) Photographs and nomination document
	Hist-MM#6: Prepare and Submit CRHR Nominations. The BETP identifies specific historical resources for nomination to the CRHR Program at the California OHP. Current photographs of the resource used in the nomination(s) will be made prior to the start of construction. The nomination document may also use current and/or historic images prepared as part of other mitigation activities. Properties subject to this mitigation will be treated in consultation with the landowner, or land-owning agencies, and the Authority. This mitigation measure is consistent with best practices within the professional historic preservation community and is commensurate with mitigation measures for similar scale transportation projects. Preparing and submitting CRHR nominations has proven to be effective in achieving the stewardship goals of Section 106 and CEQA review. Performance tracking of this mitigation measure is based upon successful implementation and approval of the documentation by the SHPO and appropriate consulting parties. <i>Rev1</i>	Implementing Party: Authority Monitoring/Reporting Party: Authority, in consultation with the SHPO and appropriate consulting agencies	X	X			Prior to construction	BETP Photographs and recordation document per National Parks Service (NPS) HABS/HAER/HALS guidelines (up to Level II HABS written data standards)
	Hist-MM#7: Prepare and Submit HABS/ HAER/ HALS Documentation. The BETP identifies specific historical resources that would be physically altered, damaged, relocated, or destroyed by the project and that may be documented in compliance with the HABS/HAER/HALS programs. Consultation with the SHPO, NPS, and the consulting parties will be required if any of the resources must be documented to these standards. Prior to the start of construction, in consultation with the Western Regional Office of the NPS, Oakland, California, large-format (4-inch by 5-inch, or larger, negative-size) black and white photographs will be taken of these historic properties/historical resources showing them in context, as well as details of character-defining features. The photographs will be processed for archival permanence in accordance with HABS/HAER/HALS photographic specifications. Each view will be fully captioned and, if necessary, perspective corrected. Oblique aerial photography will be considered as a photographic recordation	Implementing Party: Authority, in consultation with the Western Regional Office of the NPS Monitoring/Reporting Party: Authority, in consultation with the SHPO and appropriate consulting agencies	X				Prior to construction	BETP HSR

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	<p>option in these coordination efforts.</p> <p>The recordation will follow the NPS HABS/HAER/HALS guidelines, and the report format, views, and other documentation details will be coordinated with the NPS. It is anticipated that the recordation of historic properties will be completed to Level II HABS written data standards and will include archival and digital reproduction of historic images, plans, and drawings, if available. Copies of the documentation will be offered to the appropriate local governments, historical societies and agencies, and libraries. The documentation will also be offered in printed and electronic form to any repository or organization upon which SHPO, the Authority, and local agency with jurisdiction over the property, through consultation, may agree. The electronic copy of the report may also be placed on an agency or organization's web site.</p> <p>This mitigation measure is consistent with best practices within the professional historic preservation community and is commensurate with mitigation measures for similar scale transportation projects. Preparing and submitting HABS/HAER/HALS documentation has proven to be effective in achieving the stewardship goals of Section 106 and CEQA review. Performance tracking of this mitigation measure is based upon successful implementation and approval of the documentation by the SHPO and appropriate consulting parties.</p> <p><i>Rev1</i></p>							
	<p>Hist-MM#8: Prepare Historic Structure Reports. The BETP identifies historic properties/historical resources that would be physically altered, damaged, or relocated that would be subject to an HSR. The HSR will be prepared prior to the start of construction. The HSR will follow the general guidelines for such reports as described in the California OHP publication, <i>Historic Structure Report Format</i>.⁴ The scope of each HSR will be developed in consultation with the land-owning agencies, the SHPO, and appropriate consulting parties. The HSR will include documentation of existing landscaping, if appropriate. The HSRs may be used in the ongoing planning process and re-use of the properties, and may be coordinated with the other mitigation documentation activities, such as HABS/HAER records.</p> <p>This mitigation measure is consistent with best practices within the professional historic preservation community and is commensurate with mitigation measures for similar scale transportation projects. Preparing HSRs has proven to be effective in achieving the stewardship goals of Section 106 and CEQA review. Performance tracking of this mitigation measure is based upon successful implementation and approval of the documentation by the SHPO and appropriate consulting parties.</p> <p><i>Rev1</i></p>	<p>Implementing Party: Authority Monitoring/Reporting Party: Authority, in consultation with the SHPO and appropriate consulting agencies</p>	X				<p>Prior to construction</p>	<p>BETP</p> <p>Interpretive exhibits</p> <p>Informative permanent metal plaques</p>

⁴ California Office of Historic Preservation. 2012. *Historic Structure Report Format*. Available at http://ohp.parks.ca.gov/?page_id=1069. Accessed June 2012. Sacramento, The Selected Alternative includes the Hybrid Alternative, Merced Downtown Station, and Fresno Mariposa Street Station Alternative, as described in the Record of Decision and Chapter 2 of the Merced to Fresno Section Final EIR/EIS

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing					Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
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	<p>Hist-MM#9: Prepare Interpretive Exhibits. Some historic properties/historical resources may be identified in the BETP for historic interpretation. Interpretive exhibits will provide information regarding the specific historic property or historical resource. The interpretive exhibits will utilize images, narrative history, drawings, or other material produced for the mitigation described above, including the HABS/HAER reports, NRHP and CRHR nominations, or other archival sources. The interpretive exhibits may be in the form of, but are not limited to, interpretive display panels and/or printed material for dissemination to the public. The interpretive exhibits may be installed at local libraries, historical societies, or public buildings.</p> <p>All historic properties/historical resources demolished by the project will be the subject of informative permanent metal plaques that will be installed at the site of the demolished historic property, or at nearby public locations. The plaques will provide a brief history of the property, its engineering/architectural features and characteristics, and the reasons for and date of its demolition.</p> <p>This mitigation measure is consistent with best practices within the professional historic preservation community and is commensurate with mitigation measures for similar scale transportation projects. Preparing interpretive exhibits has proven to be effective in achieving the stewardship goals of Section 106 and CEQA review. Performance tracking of this mitigation measure is based upon successful implementation and approval of the documentation by the SHPO and appropriate consulting parties.</p> <p><i>Rev1</i></p>	<p>Implementing Party: Authority Monitoring/Reporting Party: Authority, in consultation with the SHPO and appropriate consulting agencies <i>Rev1</i></p>			X		Post-construction/annual reporting	<p>BETP</p> <p>Photographic documentation</p> <p>Plan for repairs to historic properties</p>	
	<p>Hist-MM#10: Plan Repair of Inadvertent Damage. The BETP provides a plan for the treatment of inadvertent damage to historic properties/historical resources. The plan will be developed prior to construction, and it states that damage resulting from the project to any of the historic properties/ historical resources near construction activities will be treated in accordance with the SOI's Standards for the Treatment of Historic Properties. The HSR, and/or HABS/HAER, recordation will photographically document the condition of historic properties/historical resources prior to the start of construction to establish the baseline condition for assessing damage. A copy of this photographic documentation will be provided to the landowner or land-owning agencies. Prior to implementation, plans for any repairs to historic properties will be submitted for SHPO review and comment to verify conformance with the SOI's Standards for Rehabilitation.</p> <p>This mitigation measure is consistent with best practices within the professional historic preservation community and is commensurate with mitigation measures for similar scale transportation projects. This type of measure and proven to be effective in achieving the stewardship goals of Section 106 and CEQA review. Performance tracking of this mitigation measure is based upon successful treatment of any damage to historic properties/historical resources and approval of that work by the SHPO and appropriate consulting parties.</p> <p><i>Rev1</i></p>	<p>Implementing Party: Authority Monitoring/Reporting Party: Authority, in consultation with the SHPO and appropriate consulting agencies</p>		X	X		Prior to construction	<p>Historic American Building Survey (HABS)/Historic American Engineering Record (HAER)/</p> <p>Conformance with SOI's Standards of Rehabilitation</p>	

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing					Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
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: Effect on Historically Significant Built-Environment Resources During Construction	Hist-MM#1: Avoid Adverse Construction Vibration Effects. See description above in Impact Hist#1: Effect on Historically Significant Built-Environment Resources During Construction <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor and Authority in consultation with the SHPO and appropriate consulting agencies. <i>Rev1</i>	X	X	X		Preconstruction surveys and Construction	BETP PA	
	Hist-MM#2: Develop Protection and Stabilization Measures. See description above in Impact Hist#1: Effect on Historically Significant Built-Environment Resources During Construction <i>Rev1</i>	Implementing Party: Contractor and Authority, in consultation with the landowner, land-owning agencies, SHPO, and the MOA signatories, as required by the Programmatic Agreement (PA). Monitoring/Reporting Party: Contractor and Authority, in consultation with the SHPO and appropriate consulting agencies	X	X			Preconstruction surveys and Construction Construction/weekly reporting	BETP PA Historic Structure Report (HSR) and the relocation plan	
	Hist-MM#3: Minimize Adverse Effects through Relocation of Historic Structures. See description above in Impact Hist# 1: Effect on Historically Significant Built Environment Resources During Construction <i>Rev1</i>	Implementing Party: Contractor Monitoring/Reporting Party: Contractor and Authority, in consultation with the SHPO and appropriate consulting agencies <i>Rev1</i>	X	X			Preconstruction surveys and Construction/weekly reporting	BETP (current BETP does not specify any resources requiring mitigation; however, future amendments to the BETP may identify such resources) Photographs and nomination document	

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing					Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
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	<p>N&V-MM#1: Construction noise mitigation measures. Monitor construction noise to verify compliance with the limits. Provide the contractor the flexibility to meet the FTA construction noise limits in the most efficient and cost-effective manner. The contractor would have the flexibility of either prohibiting certain noise-generating activities during nighttime hours or providing additional noise control measures to meet the noise limits. To meet required noise limits, the following noise control mitigation measures will be implemented as necessary, for nighttime and daytime:</p> <ul style="list-style-type: none"> • Install a temporary construction site sound barrier near a noise source. • Avoid nighttime construction in residential neighborhoods. • 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. • During nighttime work, use smart back-up alarms, which automatically adjust the alarm level based on the background noise level, or switch off back-up alarms and replace with spotters. • Use low-noise emission equipment. • Implement noise-deadening measures for truck loading and operations. • Monitor and maintain equipment to meet noise limits. • 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. • Prohibit aboveground jackhammering and impact pile driving during nighttime hours. • Minimize the use of generators to power equipment. • Limit use of public address systems. • Grade surface irregularities on construction sites. • Use moveable sound barriers at the source of the construction activity. • Limit or avoid certain noisy activities during nighttime hours. <p>To mitigate noise related to pile driving, the use of an augur to install the piles instead of a pile driver would reduce noise levels substantially. If pile driving is necessary, limit the time of day that the activity can occur.</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>		X			Construction/weekly reporting	Contract Requirements/ Specifications	

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
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	<p>Hist-MM#5: Prepare and Submit NRHP Nominations. See description above in Hist#1: Effect on Historically Significant Built-Environment Resources During Construction <i>Rev1</i></p>	<p>Implementing Party: Authority Monitoring/Reporting Party: Authority, in consultation with the SHPO and appropriate consulting agencies <i>Rev1</i></p>	X	X			Prior to construction/monthly reporting	<p>BETP (current BETP does not specify any resources requiring mitigation; however, future amendments to the BETP may identify such resources)</p> <p>Photographs and nomination document</p>
	<p>Hist-MM#6: Prepare and Submit CRHR Nominations. See description above in Impact Hist#1: Effect on Historically Significant Built-Environment Resources During Construction <i>Rev1</i></p>	<p>Implementing Party: Authority Monitoring/Reporting Party: Authority, in consultation with the SHPO and appropriate consulting agencies <i>Rev1</i></p>	X	X			Prior to construction	<p>BETP (current BETP does not specify any resources requiring mitigation; however, future amendments to the BETP may identify such resources)</p> <p>Photographs and nomination document</p> <p>Photographs and recordation document per National Parks Service (NPS) HABS/HAER/HALS guidelines (up to Level II HABS written data standards)</p>
	<p>Hist-MM#7: Prepare and submit HABS/ HAER/ HALS Documentation. See description above in Impact Hist#1: Effect on Historically Significant Built-Environment Resources During Construction <i>Rev1</i></p>	<p>Implementing Party: Authority, in consultation with the Western Regional Office of the NPS Monitoring/Reporting Party: Authority, in consultation with the SHPO and appropriate consulting agencies <i>Rev1</i></p>	X				Prior to construction	<p>BETP</p> <p>HSR</p>
	<p>Hist-MM#8: Prepare Historic Structure Reports. See description above in Impact Hist#1: Effect on Historically Significant Built-Environment Resources During Construction <i>Rev1</i></p>	<p>Implementing Party: Authority Monitoring/Reporting Party: Authority, in consultation with the SHPO and appropriate consulting agencies <i>Rev1</i></p>	X				Prior to construction	<p>BETP (current BETP does not specify any resources requiring mitigation; however, future amendments to the BETP may identify such resources)</p>

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing				Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations		
	<p>Hist-MM#9: Prepare Historic Structure Exhibits. See description above in Impact Hist#1: Effect on Historically Significant Built-Environment Resources During Construction <i>Rev1</i></p>	<p>Implementing Party: Authority Monitoring/Reporting Party: Authority, in consultation with the SHPO and appropriate consulting agencies <i>Rev1</i></p>	X				Post-construction/annual reporting	<p>BETP (current BETP does not specify any resources requiring mitigation; however, future amendments to the BETP may identify such resources)</p> <p>Interpretive exhibits</p> <p>Informative permanent metal plaques</p>
	<p>Hist-MM#10: Plan Repair of Inadvertent Damage. See description above in Impact Hist#1: Effect on Historically Significant Built-Environment Resources During Construction <i>Rev1</i></p>	<p>Implementing Party: Authority Monitoring/Reporting Party: Authority, in consultation with the SHPO and appropriate consulting agencies <i>Rev1</i></p>		X	X		Prior to construction	<p>Historic American Building Survey (HABS)/ Historic American Engineering Record (HAER)/</p> <p>Conformance with SOI's Standards of Rehabilitation</p>
<p>Hist#3: Effect on Historically Significant Built-Environment Resources During Operation</p>	<p>PK-MM#5: Address Noise at Roeding Park with City of Fresno. See description above in Impact PK#7: Acquisition of Camp Pashayan Park Property. At Camp Pashayan, 0.6 acre of park area would be acquired for support columns and easement for elevated structure. <i>Rev1</i></p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X				Design and Construction	<p>The Authority will work with the City of Fresno as the resource owner to address noise impacts. It is possible that the City of Fresno would view the projected noise levels as acceptable and preferable to the implementation of mitigation measures.</p>
	<p>Hist-MM#4: Minimize Adverse Operational Noise Effects. The BETP will identify historic properties/historical resources that will be subject to treatment to help minimize indirect adverse effects caused by operational noise of the HST Project. Properties subject to this mitigation will be identified in the BETP and will be treated in consultation with the landowner, or land-owning agencies, and the CEQA lead agency (Authority). Preliminary project design options, such as noise walls, have been developed to help reduce noise impacts and follow FRA methodologies for noise abatement. <i>Rev1</i></p>	<p>Implementing Party: Contractor, consultation with the landowner, or land-owning agencies, and the CEQA lead agency Monitoring/Reporting Party: Contractor and Authority <i>Rev1</i></p>	X	X	X		Construction/weekly reporting	<p>Contract Requirements/ Specifications</p>

Table 2
Voluntary Mitigation Measures per CEQA

Significant Impact	Mitigation Measure	Implementing Party and Monitoring / Reporting Party	Mitigation Timing					Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations			
Noise and Vibration									
N&V#2: Construction Vibration Construction impacts would have moderate intensity under NEPA, but due to the temporary nature and adherence to local noise ordinances, construction noise and vibration impacts would not be significant under NEPA.	N&V-MM#2: Construction Vibration Mitigation Measures. Building damage from construction vibration is only anticipated from impact pile driving at very close distances to buildings. If piling is more than 25 to 50 feet from buildings, or if alternative methods such as push piling or augur piling can be used, damage from construction vibration is not expected to occur. Other sources of construction vibration do not generate high enough vibration levels for damage to occur. When a construction scenario has been established, preconstruction surveys will be conducted at locations within 50 feet of piling to document the existing condition of buildings in case damage is reported during or after construction. Damaged buildings would be repaired or compensation paid.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X	X		Ongoing monitoring during construction/post-construction monitoring as needed to assess damage to buildings	Contract Requirements/Specifications	
N&V#3: Severe Operational Vibration Impacts Vibration levels from HST operations are not projected to exceed the threshold outside the right-of-way along the Hybrid alternative, and this impact would not be significant under NEPA.	N&V-MM#7: Implement Proposed California High-Speed Train Project Noise and Vibration Mitigation Guidelines. Implement vibration-reducing measures such as those listed in Table 3.4-28 [of the Final Project EIR/EIS]. The table lists where the mitigation procedure will be applied, such as at the source, sensitive receiver, or along the propagation path from the source to the sensitive receiver.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X	X		Construction/weekly reporting	Noise and Vibration Mitigation Guidelines	
Public Utilities and Energy									
PUE #1: Conflicts with Existing Substations. The impacts on public utilities during operation of the HST would not be significant under NEPA.	PUE-MM#1: Redesign to Avoid Substation. Roadway modifications associated with the Hybrid Alternative would affect a substation. The final project design will avoid these conflicts through refinements of project features.	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X				Prepare construction management plan/weekly reporting	Condition of Design/Build Contract	

Table 2, Continued
Voluntary Mitigation Measures per CEQA

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing					Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations			
Safety and Security									
<p>S&S #2: Increased demand for fire, rescue, and emergency services at stations and HMF.</p> <p>No significant impacts were identified under NEPA.</p>	<p>S&S-MM#2: Monitor Response of Local Fire, Rescue and Emergency Service Providers to Incidents at Stations and the HMF and Provide a Fair Share of Cost of Service. Upon approval of the Merced to Fresno Section, the Authority will monitor service levels in the vicinity of the Merced and Fresno stations, in order to determine baseline service demands. "Service levels" consist of the monthly volume of calls for fire and police protection, as well as city- or fire protection district-funded EMT/ambulance calls that occur within the station and HMF site service areas. Prior to operation of the stations for HST service, the Authority will enter into an agreement with the public service providers of fire, police, and emergency services to fund the Authority's fair share of services above the average baseline service demand level for the station and HMF service areas (as established during the monitoring period). The fair share will be based on projected passenger use for the first year of operations, with a growth factor for the first 5 years of operation. This cost-sharing agreement will include provisions for ongoing monitoring and future negotiated amendments as the stations are expanded or passenger use increases. Such amendments will be made on a regular basis for the first 5 years of station operation, as will be provided in the agreement. To make sure that services are made available, impact fees will not constitute the sole funding mechanism, although impact fees may be used to fund capital improvements or fixtures (for example, police substation, additional fire vehicles, onsite defibrillators) necessary to service delivery.</p> <p>After the first 5 years of operation, the Authority will enter into a new or revised agreement with the public service providers of fire, police, and emergency services to fund the Authority's fair share of services. The fair share will take into account the volume of ridership, past record and trends in service demand at the stations and HMF site, new local revenues derived from station area development, and any services that the Authority may be providing at the station.</p>	<p>Implementing Party: Authority Monitoring/Reporting Party: Authority</p>	X	X	X	X	<p>Monitoring of service levels during construction in the vicinity of the Merced and Fresno stations to determine baseline service demands.</p> <p>Prior to operation of the stations for HST service</p>	<p>Authority to fund through fair share of services agreement.</p>	
Socioeconomics, Communities, and Environmental Justice									
<p>SO: The Project would result in impacts on property owners and businesses, including low income households and minority populations, and to maintain access to local businesses, residences, and emergency services.</p>	<p>SO-MM#7: Develop measures to minimize the potential for physical deterioration. The Authority will work with the communities on the design of these features consistent with Technical Memorandum 200.6, Aesthetic Guidelines for Non-Station Structures (Authority 2012). Local communities will provide input on the use of the area underneath the elevated guideway, which could be used as a trail or for business parking for new and existing businesses, making the area underneath the guideway an attractive setting for economic development or recreational uses. Where the elevated guideway is adjacent to residential areas, the Authority will plant trees along the edges of the rights-of-way to help reduce the visual contrast. The Authority will also plant vegetation within lands acquired for the project after construction is complete.</p>	<p>Implementing Party: Contractor and Authority in coordination with affected jurisdictions. Monitoring/Reporting Party: Authority</p>	X		X		<p>During Final Design/monthly and annual reporting</p>		

Table 2, Continued
Voluntary Mitigation Measures per CEQA

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing					Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations			
The impacts related to displaced residential and business properties and the impacts on school district funding would not be considered significant under NEPA.	SO-MM#8: Provide access modifications to affected farmlands. In cases where partial property acquisitions result in the division of farmlands, the Authority will provide overcrossings or undercrossings of the HST guideway to allow continued access and use of farmlands. This would include the design of overcrossings or undercrossings to allow the passage of farm equipment. Refer to Section 3.14, Agricultural Lands, for additional information. This mitigation measure will be effective because it will maintain access to farmlands for farmers whose property is bisected.	Implementing Party: Contractor and Authority in coordination with affected jurisdictions. Monitoring/Reporting Party: Authority	X					Prior to acquisitions/monthly reporting	
SO#3: Displacement of Community Facility. Acquisition of a homeless shelter in the City of Merced. Impacts on community facilities in the cities of Merced and Fresno would be of moderate intensity. Also adequate available replacement sites currently exist for affected facilities and design could further avoid the impacts. The impacts would not be considered significant under NEPA.	SO-MM#4: Implement measures to reduce impacts associated with the relocation of community facilities. Minimize impacts associated with the acquisition of the homeless shelter in Merced by conducting outreach and coordinating with the facility prior to acquisition. Coordinate with the respective parties prior to land acquisition to reconfigure or relocate facilities, as necessary, to minimize disruption to activities. To reduce disruption to the use of these community facilities, the Authority will make sure that reconfiguring of land uses or buildings or relocating of community facilities is completed before the demolition of any existing structures. Work with the City of Merced and Merced City School District to facilitate the construction of the facilities prior to demolition of the existing structures. During the design process, the Outreach Team will conduct targeted outreach efforts for these facilities to understand and determine their needs for siting criteria. This mitigation measure will be effective in minimizing the impacts of the project by completing new facilities prior to relocation being necessary, and by involving affected facilities in the process of identifying new locations for their facilities.	Implementing Party: Authority Monitoring/Reporting Party: N/A	X	X				Final design and Prior to acquisitions/monthly reporting	Outreach efforts - recruitment, training, and job set-aside programs
	SO-MM#5: Continue outreach to disproportionately and negatively affected environmental justice communities of concern. The Authority will continue to conduct substantial environmental justice outreach activities in adversely affected neighborhoods to obtain resident feedback on potential impacts and suggestions for mitigation measures. Input from these communities will be used to refine project features during the design phase and facilitate the identification of the highest priority mitigation measures developed for the Merced to Fresno section. In addition, to offset any disproportionate effects, the Authority will develop special recruitment, training, and job set-aside programs so that minority and low-income populations are able to benefit from the jobs created by the project. This type of outreach is common for large infrastructure projects with long construction periods and has been found to be effective.	Implementing Party: Contractor and Authority in coordination with affected agencies Monitoring/Reporting Party: Authority	X					Prior to acquisitions/monthly reporting	Relocation Mitigation Plan
Aesthetics and Visual Resources									
VQ#1: Visual Disturbance during Construction. Construction activities would cause visual impacts in urban areas. Under NEPA,	VQ-MM#1: Minimize Visual Disruption During Construction and from Construction Activities. Adhere to local jurisdiction construction requirements (if applicable) regarding construction-related visual/aesthetic disruption. In order to minimize visual disruption, construction will employ the following activities: <ul style="list-style-type: none"> Minimize pre-construction clearing to that necessary for construction. Limit the removal of buildings to those that would obstruct project 	Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i>	X	X				Construction/Weekly reporting	Contract Requirements/ Specifications

Table 2, Continued
Voluntary Mitigation Measures per CEQA

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing					Implementation Mechanism or Tool
			Pre-Construction	Construction	Post-Construction	Operations	Implementation Schedule/ Reporting Schedule	
construction impacts were determined to be of moderate intensity.	<p>components.</p> <ul style="list-style-type: none"> When possible, preserve existing vegetation, particularly vegetation along the edge of construction areas that may help screen views. After construction, regrade areas disturbed by construction, staging, and storage to original contours and revegetate with plant material similar in replacement numbers and type to that which was removed upon completion of construction, based upon local jurisdictional requirements. If there are no local jurisdictional requirements to follow, replace removed vegetation at a 1:1 replacement ratio for shrubs and small trees, and 2:1 replacement ratio for mature trees. For example, if 10 mature trees in an area are removed, replant 20 younger trees that after 5 to 15 years (depending upon the growth rates of the trees) would provide coverage that was similar to the coverage provided by the trees that were removed for construction. To the extent feasible, do not locate construction staging sites within immediate foreground distance (0 to 500 feet) of existing residential, recreational, or other high-sensitivity receptors. Where such siting is unavoidable, staging sites will be screened from sensitive receptors using appropriate solid screening materials such as temporary fencing and walls. Any graffiti or visual defacement of temporary fencing and walls will be painted over or removed within 5 business days. 							
	<p>VQ-MM#3: Incorporate Design Criteria for Elevated and Station Elements That Can Adapt to Local Context.</p> <p>During final design of elevated guideways and the Merced and Fresno stations, the Authority will coordinate with local jurisdictions on the design of these facilities so that they are designed appropriately to fit in with the visual context of the areas near them. This will include the following activities:</p> <p>For stations: During the station design process, establish a local consultation process with the City of Merced and the City of Fresno to identify and integrate local design features into the station design through a collaborative context-sensitive solutions approach. The process will include activities to solicit community input in their respective station areas. This effort will be coordinated with the station area planning process that will be undertaken by those cities under their station area planning grants.</p> <p>For elevated guideways in cities or unincorporated communities: During the elevated guideway design process, establish a process with the city or county with jurisdiction over the land along the elevated guideway to advance the final design through a collaborative context-sensitive solutions approach. Participants in the consultation process will meet on a regular basis to develop a consensus on the urban design elements to be incorporated into the final guideway designs. The process will include activities to solicit community input in the affected neighborhoods.</p> <p>Actions taken to help achieve integration with the local design context during the context-sensitive solutions process will include the following:</p> <p>Design HST stations and associated structures such as elevators, escalators,</p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X	X			Final design and Construction/Monthly reporting	Established local consultation process with City of Merced and City of Fresno

Table 2, Continued
Voluntary Mitigation Measures per CEQA

Significant Impact	Mitigation Measure	Implementing Party and Monitoring /Reporting Party	Mitigation Timing					Implementation Schedule/ Reporting Schedule	Implementation Mechanism or Tool
			Pre- Construction	Construction	Post- Construction	Operations			
	<p>and walkways to be attractive architectural elements or features that add visual interest to the streetscapes near them.</p> <p>Design HST station parking structures and adjacent areas to integrate visually into the areas where they would be located. Where the city has adopted applicable downtown design guidelines, the parking structures and adjacent areas will be designed to be compatible with the policies and principles of those guidelines.</p> <p>For the elevated guideways and columns, incorporate architectural elements, such as graceful curved or tapered sculptural forms and decorative surfaces, to provide visual interest. Include decorative texture treatments on large-scale concrete surfaces such as parapets and other portions of elevated guideways. Include a variety of texture, shadow lines, and other surface articulation to add visual and thematic interest. Closely coordinate the design of guideway columns and parapets with station and platform architecture to promote unity and coherence where guideways lie adjacent to stations.</p> <p>Integrate trees and landscaping into the station streetscape and plaza plans where possible to soften and buffer the appearance of guideways, columns, and elevated stations. This will be consistent with the principles of crime prevention through environmental design.</p> <p>For the stations, structures, and related open spaces: incorporate design features that provide interest and reflect the local design context. These features could include landscaping, lighting, and public art.</p>								
<p>VQ#2: Nighttime Lighting during Construction. Nighttime lighting would affect Merced and Fresno urban areas. Under NEPA, construction impacts were determined to be of negligible intensity.</p>	<p>VQ-MM#2: Minimize Light Disturbance During Construction. Where construction lighting will be required during nighttime construction, shield such lighting and direct it downward in such a manner that the light source is not visible offsite, and so that the light does not fall outside the boundaries of the project site to avoid light spillage offsite. Implementation of this mitigation measure is not expected to result in secondary impacts. <i>Rev1</i></p>	<p>Implementing Party: Contractor Monitoring/Reporting Party: Contractor <i>Rev1</i></p>	X	X			Construction/Weekly reporting	Contract Requirements/ Specifications	

APPENDIX A
Project Design Features

Project Design Features

This section includes project design features, as of September 2012, that are incorporated into, and considered a part of, the Selected Alternative⁶ for the Merced to Fresno Section of the California HST System, described generally in Chapter 2 of the Merced to Fresno Section Project EIR/EIS (referred to hereafter as the Draft or Final EIS). These design features are organized by the Final EIS resource topics and include design features described in the Final EIS chapters, as modified by the Errata (see Appendix E of the Record of Decision).

1.0 Transportation Design Features

During project design and construction, the California High-Speed Rail Authority (Authority) and Federal Railroad Administration (FRA) will implement the following design features to reduce impacts on transportation.

- 1. Off-Street Parking for Construction-Related Vehicles.** Provide adequate off-street parking for all construction-related vehicles throughout the construction period. If adequate parking cannot be provided on the construction sites, designate a remote parking area and use a shuttle bus to transfer construction workers to the job site.
- 2. Maintenance of Pedestrian Access.** Prepare specific construction management plans to address maintenance of pedestrian access during the construction period. Pedestrian access-limiting actions will include, but not be limited to, sidewalk closures, bridge closures, crosswalk closures or pedestrian rerouting at intersections, placement of construction-related material within pedestrian pathways or sidewalks, and other actions that may affect the mobility or safety of pedestrians during the construction period. If sidewalks are maintained along the construction site frontage, provide covered walkways. Pedestrian access should be maintained unless maintaining access will be unsafe for pedestrians.
- 3. Maintenance of Bicycle Access.** Prepare specific construction management plans to address maintenance of bicycle access during the construction period. Bicycle access-limiting actions will include, but not be limited to, bike lane closures or narrowing, closure or narrowing of streets that are designated bike routes, bridge closures, placement of construction-related materials within designated bike lanes or along bike routes, and other actions that may affect the mobility or safety of bicyclists during the construction period. Bicycle access should be maintained unless maintaining access will be unsafe for bicyclists.
- 4. Restriction on Construction Hours.** Construction activities, such as material deliveries and construction employees arriving and departing the site, will generally occur outside peak periods of travel on weekdays in areas that experience congestion during those hours.
- 5. Construction Truck Routes.** Deliver all construction-related equipment and materials on the local- government-designated truck routes. Prohibit heavy construction vehicles from accessing the site via other routes.

⁶ The Selected Alternative includes the Hybrid Alternative, Merced Downtown Station, and Fresno Mariposa Street Station Alternative, as described in the Record of Decision and Chapter 2 of the Merced to Fresno Section Final EIR/EIS.

- 6. Protection of Public Roadways and Railways (freight and passenger rail) during Construction.** Repair any structural damage to public roadways and railways (freight and passenger rail), returning any damaged sections to their original structural condition. Survey the condition of the public roadways along truck routes providing access to the proposed project site both before construction and after construction is complete. For railways, a “shoofly” track will be constructed within the right-of-way, where necessary, to allow existing train lines to bypass any areas closed for construction activities. Upon completion, tracks will be opened and repaired; or new mainline track will be constructed, and the “shoofly” will be removed. Complete a before-and-after survey report and submit to the Authority for review, indicating the location and extent of any damage.
- 7. Maintenance of Public Transit Access and Routes.** Coordinate with the appropriate transit jurisdiction before limiting access to public transit or limiting movement of public transit vehicles. Potential actions that will affect access to transit include, but are not limited to, relocating or removing bus stops, limiting access to bus stops or transfer facilities, or otherwise restricting or constraining public transit operations. Public transit access and routing will be maintained where feasible.
- 8. Construction Transportation Plan.** The design-builder will prepare a detailed construction transportation plan for the purpose of minimizing the impact of construction and construction traffic on adjoining and nearby roadways. The construction transportation plan will be prepared in close consultation with the pertinent city or county, and will be reviewed and approved by the Authority prior to commencing any construction activities. This plan will address in detail the activities to be carried out in each construction phase, with the requirement of maintaining traffic flow during peak travel periods. Such activities include, but are not limited to, the routing and scheduling of materials deliveries, materials staging and storage areas, construction employee arrival and departure schedules, employee parking locations, and temporary road closures, if any. The plan will provide traffic controls pursuant to the *California Manual on Uniform Traffic Control Devices*⁷ sections on temporary traffic controls and will include a traffic control plan that includes, at minimum, the following elements:

 - Temporary signage to alert drivers and pedestrians to the construction zone.
 - Flag persons or other methods of traffic control.
 - Traffic speed limitations in the construction zone.
 - Temporary road closures and provisions for alternative access during the closure.
 - Detour provisions for temporary road closures. Alternating one-way traffic will be considered as an alternative to temporary closures where practical and where it will result in better traffic flow than a detour.
 - Identified routes for construction traffic.
 - Provisions for safe pedestrian and bicycle passage, or convenient detour.

⁷ California Department of Transportation (Caltrans). 2012. *California Manual on Uniform Traffic Control Devices*.

- Provisions to minimize access disruption to residents, businesses, customers, delivery vehicles, and buses to the extent practical. Where road closures are required during construction, limit to the hours that are least disruptive to access for the adjacent land uses.
 - Provisions for farm equipment access.
 - Provisions for 24-hour access by emergency vehicles.
 - Safe vehicular and pedestrian access to local businesses and residences during construction. The plan will provide for scheduled transit access where construction will otherwise impede such access. Where an existing bus stop is within the work zone, the design-builder will provide a temporary bus stop at a convenient location away from where construction is occurring. Adequate measures will be taken to separate students and parents walking to and from the temporary bus stop from the construction zone.
 - Advance notification to the local school district of construction activities and rigorously maintained traffic control at all school bus loading zones, to ensure the safety of school children
 - Project Design Features 1-7 and 9-10.
- 9. Construction during Special Events.** Provide a mechanism to prevent roadway construction activities from reducing roadway capacity below pre-project capacity during major athletic events or other special events that attract a substantial number of visitors. Mechanisms to maintain roadway capacity include police officers directing traffic, special event parking, and use of traffic cones and within-the-curb parking or shoulder lanes for through traffic.
- 10. Additional Features in the Cities of Merced and Fresno.** In addition to the measures listed above, the Authority will also perform the following in the cities of Merced and Fresno:
- During construction, vehicle detection will be maintained on the existing, temporary, or new roadway alignment for all intersection approaches that have existing detection.
 - Changeable message signs (CMSs) will be employed to advise motorists of lane closures or detours ahead. The CMSs will be deployed 7 days prior to the start of construction at that location.
 - Where project construction will cause delays on major roadways during the construction period, the Selected Alternative will provide for a network of CMS locations to provide adequate driver notification. For example, construction-related delays at the railroad grade separations that lead to State Route (SR) 99 freeway interchanges will require CMS placement to the east to allow drivers to make alternate route decisions. In the case of work on Shaw Avenue in Fresno, recommended placement will be a CMS at Shaw Avenue just east of SR 41 and a CMS at Shaw Avenue just east of Palm Avenue. Similar CMS usage will be required

along Ashlan Avenue, Clinton Avenue, McKinley Avenue, Olive Avenue, and Belmont Avenue.

- The Authority, in conjunction with the City of Fresno Public Works Department and the City of Merced, will develop a traffic management plan on the surface transportation network to ensure minimum public safety service levels.
- During project construction, the alignment of roadways will be grade-separated and freeway overpasses to be reconstructed will be offset from the existing alignment to facilitate staged construction wherever possible.
- In Fresno in particular, Clinton Avenue over SR 99 and Ashlan Avenue over UPRR will be offset from their existing alignments to allow for the existing roadway to remain open while the new structure is being built. This type of staging may necessitate temporary ramps to and from SR 99 during various phases of construction. Four travel lanes will be maintained from 7 a.m. to 9 a.m. and from 4 p.m. to 6 p.m. on Shaw Avenue from Cornelia to Blythe Avenue (at UPRR), on Ashlan Avenue from Parkway to Valentine Avenue (at UPRR), and on Clinton Avenue from Marks Avenue to Weber Avenue (at SR 99).
- The Veterans Boulevard overpass and construction of new alignments of Golden State Boulevard and Bullard Avenue will be completed and open to traffic prior to the closure of the Carnegie Avenue at grade railroad crossing.
- During any Belmont Avenue closures that are determined to be necessary, the adjacent crossings of Olive Avenue and Divisadero Street will remain open with no lane closures at the two crossings.
- With regard to the existing railroad crossings at Divisadero, Tuolumne, and Stanislaus streets, two of the three crossings will remain open during construction.

2.0 Air Quality and Global Climate Change Design Features

During project design and construction, the Authority and FRA will implement the following design features to reduce impacts on air quality:

- Trucks will be covered to reduce significant fugitive dust emissions while hauling soil and other similar material.
- All trucks and equipment will be washed before exiting the construction site.
- Exposed surfaces and unpaved roads will be watered three times daily.
- Vehicle travel speed on unpaved roads will be reduced to 15 miles per hour (mph).
- Any dust-generating activities will be suspended when wind speed exceeds 25 mph.
- All disturbed areas, including storage piles, that are not being actively used for construction purposes will be effectively stabilized for dust emissions using water or a chemical stabilizer/suppressant, or covered with a tarp or other suitable cover or vegetative ground cover.

- All onsite unpaved roads and offsite unpaved access roads will be effectively stabilized for dust emissions using water or a chemical stabilizer/suppressant.
- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities will be effectively controlled for fugitive dust emissions by an application of water or by presoaking. With the demolition of buildings up to six stories in height, all exterior surfaces of the buildings will be wetted during demolition.
- All materials transported offsite will be covered or effectively wetted to limit visible dust emissions, and at least 6 inches of freeboard space from the top of the container will be maintained.
- All operations will limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden.
- Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, piles will be effectively stabilized for fugitive dust emissions using sufficient water or a chemical stabilizer/suppressant.
- Within urban areas, trackout will be immediately removed when it extends 50 or more feet from the site and at the end of each workday.
- Any site with 150 or more vehicle trips per day will prevent carryout and trackout.
- Use of low-volatile organic compound (VOC) paint that contains less than 10% of VOC contents. (VOC, 10%). A Super-compliant or Clean Air paint that has a lower VOC content than those required by South Coast Air Quality Monitoring District Rule 1113, will also be used when available.

2.1 Air Quality Fugitive Dust Control

Fugitive dust control measures are administered through Rule 8011. According to Rule 8011, the San Joaquin Valley Air Pollution Control District requires the implementation of control measures for fugitive dust emission sources. These measures are not considered mitigation measures because they are required by law.

3.0 Noise and Vibration Design Features

During construction, the Authority will follow FRA and Federal Transit Administration (FTA) guidelines for minimizing noise and vibration impacts at sensitive receptors.

4.0 Electromagnetic Fields/Electromagnetic Interference Design Features

The California HST Project will comply with applicable federal and state laws and regulations related to electromagnetic fields/electromagnetic interference (EMF/EMI). Project design includes an electromagnetic compatibility program plan (EMCPP), which provides for electromagnetic compatibility of HST equipment and facilities with themselves, with equipment and facilities of the HST's neighbors, and with passengers, workers, and neighbors of the HST.

The EMCPP also will guide and coordinate the EMC design, analysis, test, documentation, and certification activities among HST project management, systems, and sections through the project phases; conform with the EMC-related HST system requirements; and comply with applicable regulatory requirements, including EMC requirements in Title 49 Code of Federal Regulations (C.F.R.) Sections 200–299 for the HST systems and sections will follow the EMCPP to avoid EMF/EMI conflicts with HST operational safety.

5.0 Public Utilities/Energy Design Features

The project design incorporates precautions to avoid existing utilities and design elements that minimize electricity consumption (e.g., using regenerative braking, and energy saving equipment and facilities).

To enhance the benefits of the HST, the Authority has set a goal to procure renewable electricity to provide power for HST operations. The Authority is a member of the Sustainability Partnership with FRA, the U.S. Department of Housing and Urban Development (Region 9), FTA (Region 9), and the U.S. Environmental Protection Agency (EPA) (Region 9), established by a memorandum of understanding (MOU). The MOU serves as an umbrella agreement covering broad efforts to promote sustainability for the HST System, including implementing the renewable energy policy goal for HST operations. The Authority accessed technical assistance from the Department of Energy's National Renewable Energy Laboratory through the EPA as part of this partnership. The laboratory developed a strategic energy plan that provides signatory agencies and the Authority with guidelines to meet the goals established in the MOU. The plan recommended a net-zero approach to powering operations with 100% renewable energy. HST Project buildings will conform to U.S. Green Building Council Leadership in Energy and Environmental Design (i.e., LEED) rating standards for environmentally sustainable new construction; HST facilities, including HST stations and a heavy maintenance facility (HMF), will be certified, at minimum, at the Silver Level, and will be required to meet or exceed energy efficiency targets with the goal of zero net energy use for facilities. Achieving the Authority's policy goal of using up to 100% renewable energy sources for the HST System would result in a total estimated reduction in fossil fuel energy resources for the HST System of up to 12.7 million barrels of oil annually by 2030.⁸

6.0 Biological Resources Design Features

The Selected Alternative includes project design features such as those that minimize effects from crossing the San Joaquin River, effectively manage and reduce runoff and discharges, and facilitate wildlife movement.

6.1 Wildlife-dedicated Crossings

Crossing structures dedicated to facilitating wildlife movement will be included in the design, as discussed in Chapter 2 of the Final EIS.

⁸ Authority. 2008. *The Use of Renewable Energy Sources to Provide Power to California's High Speed Rail*. Prepared by Navigant Consulting, Inc. Rancho Cordova, CA. September 3, 2008.

6.2 Project Design Options for the San Joaquin River

A program-level environmental document (Draft Program EIS/EIR for the San Joaquin River Restoration Program⁹) for the San Joaquin River Remediation Project (SJRRP) has been prepared. The location of the project crossing is in Reach 1, which has been identified as the reach where spawning may occur. During an initial coordination meeting with Bureau of Reclamation (Reclamation) and the Department of Water Resources (DWR) on June 6, 2011, it was determined that the project design will not conflict with the SJRRP; however, this will be further evaluated as part of the permitting process, including Endangered Species Act Section 7 consultation with the National Marine Fisheries Service (NMFS). The Authority will continue to coordinate with the SJRRP.

Since the release of the Merced to Fresno Section Draft EIS, additional coordination has occurred under Section 7 of the Federal Endangered Species Act with the USFWS and NMFS for the preparation and submittal of the Biological Assessments. This coordination, particularly with NMFS, has resulted in two project design options for the crossing of the San Joaquin River.

- One design option for the river crossing utilizes a continuation (as on upland areas) of the spacing of the columns of the elevated structure as it approaches the river crossing within the inundated river channel. The proposed configuration or span arrangement utilizes piers/foundations at a spacing of 110 feet and results in the placement of three piers within the wetted perimeter of the typical low flow channel of the river. Construction will require work in the river channel for placement of the piers.
- A second design option has a configuration that uses a combination of the typical precast segmental construction up to the north bank of the river with a two-span (320- to 160-foot) steel truss superstructure spanning the main portion of the low flow channel. This second design minimizes the need to enter the wetted perimeter of the low-flow river channel. Construction will require temporary work in the river channel, including for placement of temporary piers.

As required, the construction of foundations within the edge of the active waterway will use construction methods such as the installation of sheet pile cofferdams to isolate the activity from the water column to minimize the potential for adverse effects on anadromous fish within the construction footprint. In addition, for the installation of both temporary and permanent steel casings for cast-in-drilled-hole pile construction, sheet piling for cofferdams, and pipe or H-piling for falsework, vibratory pile hammers will be used to minimize underwater acoustic impacts.

The number of foundation elements is directly related to the span arrangement necessary to meet the requirements for bridge hydraulics. Since the future crossing will be located upstream from the two existing bridge structures that carry SR 99 and the UPRR, the hydraulic effect of the placement of new piers within the river corridor on downstream structures and the geomorphology of the channel will be considered during the design of the final configuration of the structure. The HST crossing will be designed with the planned increase in river flows and will not conflict with the goals of the restoration flows.

⁹ Reclamation and DWR. 2011. *Draft Program Environmental Impact Statement/Environmental Impact Report for the San Joaquin River Restoration Program, California – Executive Summary*. April 2011.

Regardless of the design option, the HST crossing will be designed with due consideration for the anticipated increases in river flows resulting from the implementation of the SJRRP and to minimize any appreciable changes in scour, sediment transport and deposition, or changes in geomorphic processes that could alter habitat conditions in a manner that will impede the reestablishment of these species. The Authority, in partnership with the design-build team, will design and conduct a hydraulics/hydrology analysis with appropriate modeling tools and incorporate site-specific data including the needed geotechnical investigations, to establish the design requirements, including sizing and siting of features as well as construction techniques, that are compatible with habitat conditions that support salmonid utilization of the San Joaquin River within the area affected by the proposed HST crossing.

The design will be evaluated in consultation with NMFS, the California Department of Fish and Game, Reclamation, and the U.S. Army Corps of Engineers (USACE).

6.3 Project Design Features for Stormwater Management and Treatment

During the detailed design phase, the design-build team will evaluate each receiving stormwater system's capacity to accommodate project runoff. As necessary, this phase will include the following:

- Design onsite stormwater management measures, such as detention or selected upgrades to the receiving system, to provide adequate capacity.
- Design and construct onsite stormwater management facilities to capture runoff and provide treatment prior to discharge for pollutant-generating surfaces, including station parking areas, access roads, new road overpasses and underpasses, reconstructed interchanges, and new or relocated roads and highways.
- Consider the use of constructed wetland systems, biofiltration and bioretention systems, wet ponds, organic mulch layers, planting soil beds, and vegetated systems (biofilters) such as vegetated swales and grass filter strips.
- Use portions of the HMF site for onsite infiltration of runoff, if feasible, or for stormwater detention if not. Incorporate vegetated setbacks from streams.

6.4 Project Design Features for Flood Protection

Design of the Selected Alternative will allow the HST to remain operational during flood events and will minimize increases in 100-year flood elevations, including the following:

- In Special Flood Hazard Areas, raise the track at least 4 feet above the 100-year flood elevation.
- Minimize development within the floodplain as appropriate. Avoid placement of facilities in the floodplain (e.g., at the Castle Commerce Center HMF site and the Gordon-Shaw HMF) or raise the ground with fill above the base-flood elevation.

Crossing design will maintain a floodwater surface elevation of no greater than 0.1 foot above current levels (zero rise within designated floodways). The following design considerations will minimize the effects of pier placement in the floodways:

- Design site crossings to be as nearly perpendicular to the channel as feasible to minimize bridge length.
- Orient piers to be parallel to the expected high water flow direction to minimize flow disturbance.
- Elevate bridge crossings at least 3 feet above the high water surface elevation to provide adequate clearance for floating debris or as required by local agencies. (The Central Valley Flood Protection Board requires that the bottom members [soffit] of a proposed bridge be at least 3 feet above the calculated water surface elevation for the design flood. The required clearance may be reduced to 2 feet on minor streams at sites where significant amounts of stream debris are unlikely.)
- Conduct engineering analyses of channel scour depths at each crossing to evaluate the necessary embedment depth for bridge piers. Implement scour-control measures to reduce erosion potential.
- Use quarry stone, cobblestone, or their equivalent for erosion control along rivers and streams, complemented with native riparian plantings or other natural stabilization alternatives that will restore and maintain a natural riparian corridor, where feasible.
- Place bedding materials under stone protection at locations where the underlying soils require stabilization resulting from streamflow velocity.

6.5 Construction Stormwater Pollution Prevention Plan

The State Water Resources Control Board (SWRCB) Construction General Permit (2009-0009-DWQ)¹⁰ establishes three erosion risk levels that are based on site erosion and receiving-water risk factors. A preliminary analysis indicates that most of the Selected Alternative will fall under Erosion Risk Level 1, the lowest risk level. The portion of the project vicinity draining to the San Joaquin River will fall under Erosion Risk Level 2. Erosion Risk Level 2 measures also will be carried out anywhere in the project vicinity where construction activities are conducted within or immediately adjacent to sensitive environmental areas such as streams, wetlands, and vernal pools.

The Construction General Permit requires preparation and implementation of a stormwater pollution prevention plan (SWPPP), which will identify best management practices (BMPs) to minimize potential short-term increases in sediment transport caused by construction, including erosion control requirements, stormwater management, and channel dewatering for affected stream crossings. These BMPs could include measures to provide permeable surfaces where feasible and to retain and treat stormwater on site. Other BMPs include strategies to manage the overall amount and quality of stormwater runoff. Typical BMPs include:

- Practices to minimize the contact of construction materials, equipment, and maintenance supplies with stormwater.

¹⁰ SWRCB. 2009. *National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges associated with Construction and Land Disturbance Activities*. Order No. 2009-0009-DWQ. Adopted September 2, 2009. Sacramento, CA. Available at http://www.swrcb.ca.gov/board_decisions/adopted_orders/water_quality/2009/wqo/wqo2009_00_09_dwq.pdf.

Accessed September 6, 2010.

- Limiting fueling and other activities using hazardous materials to areas distant from surface water, providing drip pans under equipment, and daily checks for vehicle condition.
- Practices to reduce erosion of exposed soil, including soil stabilization, watering for dust control, perimeter silt fences, placement of rice straw bales, and sediment basins.
- Practices to maintain water quality including silt fences, stabilized construction entrances, grass buffer strips, ponding areas, organic mulch layers, inlet protection, and Baker tanks and sediment traps to settle sediment.
- Practices to capture and provide proper offsite disposal of concrete washwater, including isolation of runoff from fresh concrete during curing to prevent it from reaching the local drainage system, and possible treatment with dry ice or other acceptable means to reduce the alkaline character of the runoff (high pH) that typically results from new concrete.
- Development of a spill prevention and emergency response plan to manage potential fuel or other spills.
- Use of diversion ditches to intercept offsite surface runoff.
- Where feasible, avoidance of areas that may have substantial erosion risk, including areas with erosive soils and steep slopes.
- Where feasible, limiting construction to dry periods when flows in water bodies are low or absent.

6.6 Central Valley Regional Water Quality Board, Order No. 5-00-175, Waste Discharge Requirements General Order for Dewatering and Other Low Threat Discharges to Surface Waters

This order is a permit that covers construction dewatering discharges and some other listed discharges that do not contain significant quantities of pollutants, and that either: (1) are 4 months or less in duration, or (2) have an average dry-weather discharge that does not exceed 0.25 million gallons per day.

The CVFPB regulates specific river, creek, and slough crossings for flood protection. These crossings must meet the provisions of Title 23 of the California Code of Regulations. Title 23 requires that new crossings maintain hydraulic capacity through such measures as in-line piers, adequate streambank height (freeboard), and measures to protect against streambank and channel erosion. Section 208.10 requires that improvements, including crossings, be constructed in a manner that does not reduce the channel's capacity or functionality, or that of any federal flood control project. The CVFPB reviews encroachment permit applications for approval of a new channel crossing or other channel modification. For a proposed crossing or placement of a structure near a federal flood control project, the CVFPB coordinates review of the encroachment permit application with USACE pursuant to assurance agreements with USACE and the USACE operation and maintenance manuals under Title 33 C.F.R., Section 208.10 and Title 33 United States Code, Section 408. Under Section 408 of the Rivers and Harbors Act, USACE must approve any proposed modification that involves a federal flood control project. A Section 408 permit would be required if construction modifies a federal levee. A Section 208.10 permit would be required where the Selected Alternative encroaches on a federal facility but does not modify it.

6.7 Maintain Pre-Project Hydrology

Avoid increasing existing peak stormwater flows from the project site. This will be accomplished by emphasizing onsite retention of stormwater runoff using measures such as flow dispersion, infiltration, and evaporation, supplemented by detention, where required. Additional flow control measures could be implemented where local regulations or drainage requirements dictate.

6.8 Industrial Stormwater Pollution Prevention Plan

The stormwater general permit (97-03-DWQ)¹¹ requires the preparation of an SWPPP and a monitoring plan for industrial facilities, including vehicle maintenance facilities associated with transportation operations. The permit includes performance standards for pollution control.

7.0 Hydrology and Water Quality Design Features

During project design and construction, the Authority will ensure the measures outlined below are implemented to reduce and avoid impacts on water resources as discussed in the Final EIS Section 3.8.5, Environmental Consequences. Appendix C of the Merced to Fresno Section Hydraulics and Floodplain Technical Report¹² provides a matrix that lists relevant standards and regulations for these impacts. These measures and standards are discussed in greater detail in support documents prepared for the preliminary design, including the following:

- HST *Technical Memorandum 2.6.5, Hydraulics and Hydrology Design Guidelines*.¹³
- *Hydraulics and Floodplain Technical Report, California High-Speed Train Project EIR/EIS, Merced to Fresno Section*¹⁴ (project-wide, and for Construction Package 1A).
- *Merced to Fresno Section Stormwater Management Plan, California High-Speed Train Project EIR/EIS, Merced to Fresno Section*¹⁵ (project-wide, and for Construction Package 1A).

These measures are considered to be part of the Selected Alternative and are described in the following text. Additionally, the Selected Alternative will require an Individual Section 404 Permit from USACE. This permit will have conditions to further minimize water quality impacts.

¹¹ State Water Resources Control Board (SWRCB). 2000. *Water Quality Order No. 97-03-DWQ National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000001 (General Permit). Waste Discharge Requirements (WDRS) for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities*. Sacramento, CA. Available at http://www.swrcb.ca.gov/water_issues/programs/stormwater/docs/induspmnt.pdf.

¹² Authority and FRA. 2012. *Hydraulics and Floodplain Technical Report, California High-Speed Train Project EIR/EIS, Merced to Fresno Section*. Prepared by AECOM and CH2M HILL. Sacramento, CA, and Washington, DC. April 2012.

¹³ Authority. 2010. *Technical Memorandum 2.6.5, Hydraulics and Hydrology Design Guidelines*. Available at <http://www.cahighspeedrail.ca.gov/>. Prepared by Parsons Brinckerhoff. Sacramento, CA. June 10, 2010.

¹⁴ Authority and FRA. 2012. *Hydraulics and Floodplain Technical Report, California High-Speed Train Project EIR/EIS, Merced to Fresno Section*. Prepared by AECOM and CH2M HILL. Sacramento, CA, and Washington, DC. April 2012.

¹⁵ Authority and FRA. 2012. *Stormwater Management Plan, California High-Speed Train Project EIR/EIS, Merced to Fresno Section*. Sacramento, CA. April 2012.

7.1 Project Design Features for Stormwater Management and Treatment

During the detailed design phase, evaluate each receiving stormwater system's capacity to accommodate project runoff. As necessary, design onsite stormwater management measures, such as detention or selected upgrades to the receiving system, to provide adequate capacity. Design and construct onsite stormwater management facilities to capture runoff and provide treatment prior to discharge for pollutant-generating surfaces, including station parking areas, access roads, new road overpasses and underpasses, reconstructed interchanges, and new or relocated roads and highways. Use low-impact development techniques to retain runoff onsite and to reduce offsite runoff, to the extent practical. Consider the use of constructed wetland systems, biofiltration and bioretention systems, wet ponds, organic mulch layers, planting soil beds, and vegetated systems (biofilters) such as vegetated swales and grass filter strips. Use portions of the HMF site for onsite infiltration of runoff, if feasible, or for stormwater detention, if not. Incorporate vegetated set-backs from streams, such as Canal Creek and Berenda Creek.

8.0 Geology, Soils, and Seismicity Design Features

Project design will incorporate existing design measures and BMPs based on federal and state regulations and based on the Program EIR/EIS documents. Table 5-1 in the Merced to Fresno Section Geology and Soils Technical Report¹⁶ provides a matrix that lists relevant standards and regulations for the impacts identified in the Final EIS Section 3.9.5, Environmental Consequences. Site-specific explorations will be carried out as design work progresses so that the Authority can incorporate site-specific engineering solutions that adhere to standard engineering design practices and codes into the design to reduce risks associated with geology, soils, and seismicity. Versions of the standard engineering design guidelines and standards applicable at the time this document was prepared (2011) are described below; the versions of these guidelines and standards applicable at the time of final design and construction will be used:

- **American Association of State Highway and Transportation Officials (AASHTO) Manuals:** 2010 AASHTO Load and Resistance Factor Design (LRFD) Bridge Design Specifications (5th Edition)¹⁷ and the 2009 AASHTO Guide Specifications for LRFD Seismic Bridge Design¹⁸ provide guidance for characterization of soils, as well as methods to be used in the design of bridge foundations and structures, retained cuts and retained fills, at-grade segments, and buried structures. These design specifications will provide minimum specifications for evaluating the seismic response of the soil and structures.
- **Federal Highway Administration Circulars and Reference Manuals:** These documents provide detailed guidance on the characterization of geotechnical conditions at sites, methods for performing foundation design, and recommendations on foundation construction. These guidance documents include methods for designing retaining walls used for retained cuts and retained fills, foundations for elevated structures, and at-grade segments. Some of the documents include guidance on methods of mitigating geologic hazards that are encountered during design.

¹⁶ Authority and FRA. 2012. *Geology, Soils, and Seismicity Technical Report, Merced to Fresno Section Project EIR/EIS*. April 2012.

¹⁷ AASHTO. 2010. *2010 AASHTO Load and Resistance Factor Design (LRFD) Bridge Design Specifications (5th Edition)*. Washington, DC.

¹⁸ AASHTO. 2009. *2009 AASHTO Guide Specifications for LRFD Seismic Bridge Design*. Washington, DC.

- **American Railway Engineering and Maintenance-of-Way Association Manual:** These guidelines deal with rail systems. Although they cover many of the same general topics as AASHTO, they are more focused on best practices for rail systems. The manual includes principles, data, specifications, plans, and economics pertaining to the engineering, design, and construction of railways.¹⁹
- **California Building Code (CBC):** The CBC is based on the 2006 International Building Code (IBC). This code contains general building design and construction requirements relating to fire and life safety, structural safety, and access compliance.
- **IBC and American Society of Civil Engineers (ASCE)-7:** These codes and standards provide minimum design loads for buildings and other structures. They will be used for the design of the maintenance facilities and stations. Sections in the IBC and ASCE-7 provide minimum requirements for geotechnical investigations, levels of earthquake ground shaking, minimum standards for structural design, and inspection and testing requirements.^{20,21}
- **Caltrans Design Standards:** Caltrans has specific minimum design and construction standards for all aspects of transportation system design, ranging from geotechnical explorations to construction practices. Caltrans design standards include state-specific amendments to the AASHTO LRFD Bridge Design Specifications²² and Guide Specifications for LRFD Seismic Bridge Design.²³ These amendments provide specific guidance for the design of deep foundations used to support elevated structures, for design of mechanically stabilized earth walls used for retained fills, and for design of various types of cantilever (e.g., soldier pile, secant pile, and tangent pile) and tie-back walls used for retained cuts.
- **ASTM International (ASTM):** ASTM has developed standards and guidelines for all types of material testing, from soil compaction testing to concrete strength testing. The ASTM standards also include minimum performance requirements for materials. Most of the guidelines and standards cited above use ASTM or a corresponding series of standards from AASHTO so that quality is achieved in the constructed project.²⁴

To manage geologic, soils, and seismic hazards, projects implement specific design measures to reduce and avoid impacts during construction and operation. These practices include the following:

- **Limit Groundwater Withdrawal:** Control the amount of groundwater withdrawal, re-inject groundwater at specific locations, or use alternate foundations to offset the potential for settlement. This control is important for locations with retained cuts in areas of high groundwater and where existing buildings are located near the depressed track section.

¹⁹ American Railway Engineering and Maintenance-of-Way Association. 2009. *Manual for Railway Engineering*. January 1, 2009.

²⁰ IBC. 2006. *2006 International Building Code (IBC)*. Washington, DC.

²¹ ASCE. 2010. *Minimum Design Loads for Buildings and Other Structures ASCE 7-10*. May 12, 2010.

²² AASHTO. 2010. *2010 AASHTO Load and Resistance Factor Design (LRFD) Bridge Design Specifications (5th Edition)*. Washington, DC.

²³ AASHTO. 2009. *2009 AASHTO Guide Specifications for LRFD Seismic Bridge Design*. Washington, DC.

²⁴ ASTM. 2012. *Annual Book of ASTM Standards. Volume 4.02 Concrete and Aggregate; Volume 4.08 Soil and Rock; Volume 4.09 Soil and Rock II; Volume 4.03 Geosynthetics*. West Conshohocken, PA.

- **Monitor Slopes:** Incorporate slope monitoring into final design where a potential for long-term instability exists from gravity or seismic loading. This practice is important near at-grade sections where slope failure could result in loss of track support or where slope failure could result in additional earth loading to foundations supporting elevated structures.
- **Suspend Operations before and after Earthquake:** Use motion-sensing instruments to provide ground-motion data; implement a control system to shut down HST operations temporarily during or after an earthquake to reduce risks. Monitoring is appropriate for any location where high ground motions could damage the HST track system. Candidate locations include elevated guideways, retained earth, retained cut, and at-grade segments.
- **Conduct Geotechnical Inspections:** Prior to and throughout construction, conduct geotechnical inspections to verify that no new, unanticipated conditions are encountered and to determine the locations of unstable soils in need of improvement.
- **Improve Unstable Soils:** For unstable soils the risk of ground failure can be minimized or avoided by various methods. If the soft or loose soils are shallow, they can be excavated and replaced with competent soils. Where unsuitable soils are deeper, ground improvement methods such as stone columns, cement deep soil mixing (CDSM), or jet grouting could be used. Alternately, if sufficient construction time is available, preloading in combination with prefabricated vertical drains (wicks) and staged construction can be used to gradually improve the strength of the soil without causing bearing capacity failures. Both over-excavation and ground improvement methods have been successfully used to improve similar soft or loose soils. The application of these methods is most likely at stream and river crossings, where soft soils could occur; however, localized deposits could occur at other locations along the alignment. The ground improvement or over-excavation methods may also be necessary at the start of approach fills for elevated track sections or retained earth segments of the alignment if the earth loads exceed the bearing capacity of the soil. Alternately, at these locations earth fills might be replaced by light-weight fill such as extruded polystyrene (geofoam), or short columns and cast-in-drill hole (CIDH) piles might be used to support the transition from the elevated track to the at-grade alignment.
- **Improve Settlement-Prone Soils:** Settlement-prone soils are improved prior to facility construction. Ground improvement is used to transfer new earth loads to deeper, more competent soils. Another alternative is to use preloads and surcharges with wick drains to accelerate settlement within areas that are predicted to undergo excessive settlement. By using the preload and surcharge with wick drains, settlement would be forced to occur. The application of these methods is most likely at stream and river crossings, where soft soils are more likely to occur. Where groundwater is potentially within 50 feet of the ground surface, any below-ground excavations use well points in combination with sheetpile walls to limit the amount of settlement of adjacent properties from temporary water drawdown. Alternately, water can be re-injected to make up for localized water withdrawal.
- **Prevent Water and Wind Erosion:** Many engineering methods exist for controlling water and wind erosion of soils. These include use of straw bales and mulches, revegetation, and covering areas with geotextiles. Where the rate of water runoff could be high, rip rap and rip rap check dams could be used to slow down the rate of water runoffs. Other BMPs for water are discussed in the Final EIS Section 3.8, Hydrology and Water Resources. Implementation of these methods is important where large sections of earth is exposed during construction, such as for retained-cut segments.

- Modify or Remove and Replace Soils with Shrink-Swell Potential and Corrosion Characteristics:** One option is to excavate and replace soils that represent the highest risk. In locations where shrink-swell potential is marginally unacceptable, soil additives would be mixed with existing soil to reduce the shrink-swell potential. The decision whether to remove or treat the soil is made on the basis of specific shrink-swell potential or corrosivity characteristics of the soil, the additional costs for treatment versus excavation and replacement, as well as the long-term performance characteristics of the treated soil. This practice is important for at-grade segments of the alignment because these are most likely to be affected by shrink-swell potential or corrosive soils.
- Evaluate and Design for Large Seismic Ground Shaking:** Conduct detailed seismic studies to establish the most up-to-date estimation of levels of ground motion. Use updated Caltrans seismic design criteria in the design of any structures supported in or on the ground. These design procedures and features reduce the potential that moments, shear forces, and displacements that result from inertial response of the structure lead to collapse of the structure. In critical locations, pendulum base isolators can reduce the levels of inertial forces. New composite materials can enhance seismic performance.
- Secondary Seismic Hazards:** As discussed above, various ground improvement methods can be implemented to reduce the potential for liquefaction, liquefaction-induced lateral spreading or flow of slopes, or post-earthquake settlement. Ground improvement around CIDH piles improves the lateral capacity of the CIDH during seismic loading. CDSM or jet grouting develop resistance to lateral flow or spreading of liquefied soils.

9.0 Hazardous Materials and Wastes Design Features

As part of the Selected Alternative, materials and wastes will be handled, transported, and disposed of in accordance with applicable state and federal regulations, such as the Resource Conservation and Recovery Act, the Comprehensive Environmental Response, Compensation, and Liability Act, the Hazardous Materials Release Response Plans and Inventory Law, and the Hazardous Waste Control Act (see the Final EIS Section 3.3, Air Quality and Global Climate Change, for regulations applying to hazardous air pollutants). During the property acquisition process, analysis of properties acquired for construction of the HST will be conducted, including title searches and determination of which properties require further assessment for hazardous material contamination. Where current site conditions or documented past land use practices provide a reason to believe that an unusual buildup of potentially hazardous materials has occurred, the Authority will conduct a Phase 1 environmental site assessment in accordance with standard ASTM methodologies to characterize the site. The determination of which parcels require soil testing and where sampling should occur will be informed by the Phase 1 environmental site assessment and made in conjunction with state and local agency officials. Testing and appropriate remediation will be conducted prior to construction. Remediation activities may include removal of contamination, in situ treatment, or soil capping. Nominal design variances, such as the addition of a plastic barrier beneath the ballast material to limit the potential release of volatile subsurface contaminants, may be implemented in conjunction with site investigation and remediation. All work within 1,000 feet of a landfill will require methane protection measures, including gas detection systems and personnel training, pursuant to Title 27, the hazardous materials contingency plan, and BMPs.

Undocumented contamination could be encountered during construction activities and the Authority will work closely with local agencies to resolve any such conflicts. A construction

management plan will be developed that will include provisions for the disturbance of undocumented contamination. In addition, demolition plans will be prepared for the safe dismantling and removal of building components and debris. The demolition plans will include a plan for lead and asbestos abatement. Further, a spill prevention, control, and countermeasures (SPCC) plan or, for smaller quantities, a spill prevention and response plan will be implemented that prescribes BMPs to follow to clean up any hazardous material release. During operation of the HST, hazardous materials monitoring plans, such as a hazardous materials business plan and an SPCC plan, will be implemented.

To the extent feasible, the Authority is committed to identifying, avoiding, and minimizing hazardous substances in the material selection process for construction, operation, and maintenance of the HST System. Moreover, the Authority will evaluate the full inventory of hazardous materials employed on an annual basis and replace hazardous substances with nonhazardous materials to the extent possible. These standards and material specifications will aid in promoting safety for passengers and employees.

Existing standards and regulations address many of the impacts identified in this analysis. Table 6-4 in the Merced to Fresno Section Hazardous Materials/Wastes Technical Report²⁵ provides a matrix that indicates relevant standards and regulations for these impacts.

10.0 Safety and Security Design Features

Project design will incorporate engineering measures and best management practices based on federal and state regulations and on Program EIR/EIS documents. The standard engineering design guidelines and regulatory requirements include the following:

- Final design includes development of a detailed construction transportation plan that will involve coordination with local jurisdictions on emergency vehicle access. The plan will also include a traffic control plan that addresses temporary road closures, detour provisions, allowable routes, and alternative access. Engineering design and construction phases include preliminary hazard analysis, collision hazard analysis, and threat and vulnerability assessment methods.
- Preliminary hazard analyses follow the U.S. Department of Defense System Safety Program Plan Requirements (MIL-STD-882D)²⁶ to identify and evaluate the facility hazards and vulnerabilities so that the design can address and either eliminate or minimize them.
- Threat and vulnerability assessments establish provisions for the deterrence and detection of, as well as the response to, criminal and terrorist acts for rail facilities and system operations. Provisions include security education and employee training specific to terrorism awareness, right-of-way fencing, intrusion detection, closed-circuit televisions, and other design features to reduce criminal and terrorist activities. Intrusion detection technology could also alert to the presence of inert objects, such as toppled tall structures or derailed freight trains, and could stop HST operations to avoid collisions.

²⁵ Authority and FRA. 2012. *Hazardous Materials/ Wastes Technical Report, California High-Speed Train Project EIR/EIS, Merced to Fresno Section*. Prepared by AECOM, CH2M HILL, and Parus Consulting, Inc. Sacramento, CA, and Washington, DC. April 2012.

²⁶ U.S. Department of Defense. 2000. *Standard Practice for System Safety. MIL-STD-882D*. Washington, DC. February 10, 2000.

- Construction safety and health plans (CSHPs) establish the minimum safety and health guidelines for contractors of, and visitors to, construction projects. CSHPs require contractors to develop and implement site-specific measures that address regulatory requirements to protect human health and property at construction sites.
- CSHPs establish the minimum safety and health guidelines for contractors of, and visitors to, construction projects. CSHPs require contractors to develop and implement site-specific measures that address regulatory requirements to protect human health and property at construction sites.
- Fire/life safety programs (FLSPs) implement the requirements set forth in the Federal Rail Safety Act. FLSPs address the safety of passengers and employees during emergency response. The FLSPs also address the needs of disabled persons. The FLSPs are coordinated with local emergency response organizations to provide them with an understanding of the rail system, facilities, and operations, and to obtain their input for modifications to emergency response operations and facilities, such as evacuation routes.
- System security plans address design features intended to maintain security at the stations within the track right-of-way, at stations, and onboard trains. The design standards and guidelines require emergency walkways on both sides of the tracks for both elevated and at-grade sections. Adequate space will be provided along at-grade sections of the alignment to allow emergency response access. Ground access will be available from elevated tracks where access to ground equipment is required. This ground access could be used in the event of an emergency. Additional ground access will be considered, consistent with fire and rescue procedures and where practical operational standards include a system-specific police force.
- Standard operating procedures and emergency operating procedures include industry best practices, such as the FRA-mandated Roadway Worker Protection Program. They address the day-to-day operation and emergency situations to maintain the safety of employees, passengers, and the public.
- System safety program plans (SSPPs) incorporate FRA requirements and are implemented upon FRA approval. These plans are based on the principles outlined in the *Manual for Development of System Safety Program Plans for Commuter Railroads*²⁷ and address project design, construction, testing, and operation.
- Rail systems must comply with the *Highway-Rail Grade Crossing Guidelines for High-Speed Passenger Rail*²⁸ and future safety regulations the FRA develops for high-speed passenger rail.
- Worker safety in the workplace is generally governed by the Occupational Safety and Health Act of 1970, which established the Occupational Safety and Health Administration (OSHA). The State of California, under an agreement with OSHA, operates an occupational safety and health program in accordance with Section 18 of the Occupational Safety and Health

²⁷ American Public Transportation Association. 2006. *Manual for the Development of System Safety Program Plans for Commuter Railroads*. Washington, DC. May 15, 2006.

²⁸ FRA. 2009. *Highway-Rail Grade Crossing Guidelines for High-Speed Passenger Rail*. Version 1.0. Washington, DC. November 2009.

Act of 1970. In California, OSHA enforcement of workplace requirements is performed by the California Department of Industrial Relations, Division of Occupational Safety and Health (better known as Cal/OSHA). Under Cal/OSHA regulations, as of July 1, 1991, every employer in California must establish, implement, and maintain an injury and illness prevention program.

- HST urban design guidelines²⁹ require implementing the principles of crime prevention through environmental design. This is a design method that focuses on reducing opportunities for crime through the design and management of the physical environment. Four basic principles of crime prevention through environmental design will be considered during station and site planning: (1) territoriality (designing physical elements that express ownership of the station or site); (2) natural surveillance (arranging physical features to maximize visibility); (3) improve sightlines (provide clear views of surrounding areas); and (4) access control (physical guidance of people coming and going from a space).

11.0 Socioeconomics, Communities, and Environmental Justice Design Features

The Authority must comply with the Uniform Relocation Act in implementing the Selected Alternative. The provisions of the Uniform Relocation Act apply to all acquisitions of real property or displacements of persons resulting from federal or federally assisted programs and projects. The Uniform Relocation Act provides for the fair and equitable treatment of those displaced persons. The Uniform Relocation Act requires that the owning agency notify all affected owners of the acquiring agency's intent to acquire an interest in their property, including a written offer letter of just compensation specifically describing those property interests and assign a right-of-way specialist to each property owner to assist them with the process. The Uniform Relocation Act also provides for benefits to displaced individuals to assist them both financially and with advisory services to help them relocate their residences or businesses. Benefits are available to both owner occupants and tenants of either residential or business properties.

The Uniform Relocation Act requires provision of relocation benefits to all eligible persons regardless of race, color, religion, sex, or national origin. Benefits to which eligible owners or tenants may be entitled will be determined on an individual basis and explained in detail by an assigned right-of-way specialist.

Similarly, the Selected Alternative must adhere to California Relocation Assistance Act requirements. Just compensation is measured by the "fair market value" of the property, which is considered to be "the highest price on the date of valuation that would be agreed to by a seller, being willing to sell, but under no particular or urgent necessity for so doing, nor obliged to sell; and a buyer, being ready, willing and able to buy but under no particular necessity for so doing, each dealing with the other with the full knowledge of all the uses and purposes for which the property is reasonably adaptable and available." (Code of Civil Procedure, Section 1263.320a).

The Authority has developed more detailed information about how it plans to comply with the Uniform Act and the California Relocation Assistance Act. The Authority has developed three

²⁹ Authority. 2011. *Urban Design Guidelines*. Prepared by PB's Placemaking Group. Sacramento, CA. March 2011.

detailed relocation assistance documents modeled after Caltrans versions. The documents are listed below and included in Appendix 3.12-A of the Final EIS:

- Your Rights and Benefits as a Displacee under the Uniform Relocation Assistance Program (Residential).
- Your Rights and Benefits as a Displacee under the Uniform Relocation Assistance Program (Mobile Home).
- Your Rights and Benefits as a Displaced Business, Farm or Nonprofit Organization under the Uniform Relocation Assistance Program.

In addition, the following are incorporated into the Selected Alternative as design features:

- **Develop and implement a construction management plan.** The design-build contractor will develop and implement a construction management plan, for approval by the Authority, to address communications, community impacts, visual protection, air quality, safety controls, noise controls, and traffic controls to minimize impacts on property owners and businesses, including low income households and minority populations, and to maintain access to local businesses, residences, and emergency services. Communications to the public will be consistent with the ongoing outreach efforts and providing in other languages, as required, including Spanish, Lao, and Hmong. The plan will maintain access to local businesses during construction and use signs to instruct customers regarding access to businesses during construction. In addition, the plan will include efforts to coordinate with local transit providers to minimize impacts on local and regional bus routes in affected communities. Construction management plans are standard for large infrastructure projects such as this one and are considered effective in minimizing community impacts.
- **Develop a relocation mitigation plan.** Before any acquisitions occur, the Authority will develop a relocation mitigation plan, in consultation with affected cities and counties. In addition to establishing a program to minimize the economic disruption related to relocation, the relocation mitigation plan will be written in a style that also enables it to be used as a public information document. The plan will be intended to meet the following objectives:
 - Provide affected property and business owners and tenants a high level of individualized assistance in situations when relocation is necessary.
 - Make a best effort to minimize the permanent closure of displaced businesses and non-profit agencies as a result of relocations.
 - Within the limits established by law and regulation, minimize the economic disruption caused to tenants and residents by relocation.
 - In individual situations where warranted, consider the cost of obtaining the entitlement permits necessary to relocate to a suitable location and take those costs into account when establishing the fair market value of the property.
 - Provide those business owners who require complex permitting (such as dairies) with regulatory compliance assistance.

The relocation mitigation plan will include the following components:

- A description of the appraisal, acquisition, and relocation process that describes the activities of the appraisal and relocation specialists, for the benefit of the reader.

- A means of assigning appraisal and relocation staff to affected property owners, tenants, or other residents on an individual basis.
- Individualized assistance to affected property owners, tenants, or other residents in applying for funding, including research to summarize loans, grants, and federal aid available, and research of demographically similar areas for relocation.
- Creation of an ombudsman’s position to act as a single point of contact for property owners, residents, and tenants with questions about the relocation process. The ombudsman will also act to address property owners’, tenants’, and other residents’ concerns about the relocation process as it applies to their situations.

12.0 Station Planning, Land Use, and Development Design Features

Between the Program EIR/EIS documents and the project EIS Documents, refined planning (i.e., HST Station Area Development: General Principles and Guidelines³⁰) has resulted in fewer anticipated conflicts regarding land use and planning. The program design strategies of involving the local jurisdictions in the development of station planning and alignment design considerations, identification of issues, and avoidance measures and solutions, as well as providing information to assist the local jurisdictions to accommodate the proposed HST and transportation-oriented development (TOD) opportunities around stations in the updates of local general plans, collectively reduce the potential for land use conflicts. By working with the local jurisdictions it is possible to identify any potential land use conflicts and work to avoid or minimize the issues. The Authority will continue to engage the local jurisdictions in continued planning and TOD opportunities. The Authority is assisting the cities of Merced and Fresno with funding for station area planning, and will work cooperatively with these jurisdictions as part of that process.

13.0 Agricultural Land Design Features

Single Point of Contact: The Authority will assign a representative to act as a single point of contact to assist each confined animal facility owner during the process of obtaining new or amended permits or other regulatory compliance necessary for the continued operation or relocation of the facility. The Authority will consider and may provide compensation when acquisition of confined animal site will either require relocation of the facility or amendment of its existing regulatory permits.

Research: During the HST testing phase, the Authority will fund a program to undertake original research on the wind and noise effects of HST operations on agricultural activities. The Authority will engage qualified researchers within the University of California or California State University systems to undertake this research. The researcher will be selected by the Authority through a request for proposal process. The research will include monitoring of noise and wind effects at representative points along the test track. The research period will include the testing phase and extend 2 years after commencement of revenue service. The Authority will publicly distribute a report of the findings of the research program. The research will include, but is not limited to, the following subjects:

³⁰ Authority. 2008. *HST Station Development Policies*. May 14, 2008, Board Meeting. Sacramento, CA. May 14, 2008.

- Generated wind speed, duration, and area of influence from HST trainsets at typical operational speeds.
- Effects of HST-generated wind on the effectiveness of honeybee pollination.
- Dust production as a result of typical HST operations, including entrainment and dispersal patterns of dust in the HST slipstream.
- Generated noise levels and duration from HST trainsets at typical operational speeds.
- Noise contours depicting modeled noise levels at distance from the tracks.
- Practical methods for reducing effects on agriculture.

Farmland Consolidation Program. The Authority will establish and administer a farmland consolidation program to sell remnant parcels to neighboring landowners for consolidation with adjacent farmland properties. In addition, the program will assist the owners of remnant parcels in selling those remnants to adjacent landowners, upon request. The goal of the program is to provide for continued agricultural use on the maximum feasible amount of remnant parcels that otherwise may not be uneconomical to farm. The program will focus on severed remainder parcels, including those that were under Williamson Act or Farmland Security Act contract at the time of right-of-way acquisition and have become too small to remain in the local Williamson Act or Farmland Security Act program. The program will assist landowners in obtaining lot line adjustments where appropriate to incorporate remnant parcels into a larger parcel that is consistent with size requirements under the local government general plan. The program will operate for a minimum of 5 years after construction of the section is completed.

The Authority and FRA expect that productive farmland will be farmed in some manner, and not left idle in perpetuity. However, the Authority and FRA recognize that constructing the Selected Alternative will have a disruptive effect on farm ownership that will temporarily idle some remainder parcels. The intent of this mitigation measure is to take responsibility for the disruptive effects and proactively work to restore remainder parcels to productive agricultural use (and not rely on market forces to accomplish the same result). This process will be a series of real estate transactions, and the Authority will use the same real property transaction processes used by Caltrans; this process features the use of Authority right-of-way agents who generally follow Caltrans procedures. The State of California has a long history of managing real estate transactions through Caltrans and other state entities (e.g., Department of General Services), which helps promote the success of the Authority's farmland consolidation program.

14.0 Parks, Recreation, and Open Space Design Features

None.

15.0 Aesthetics and Visual Quality Design Features

The Authority has adopted design standards and Design Guidelines that are established to create a minimum aesthetic quality to a long lasting infrastructure. Many of these elements are articulated in Table 3.16-2 in the Final EIS, Section 3.16.5.3, High-Speed Train Alternatives. The *Urban Design Guidelines*³¹ for the California High-Speed Train Project briefly discusses the

³¹ Authority. 2011. *Urban Design Guidelines*. Prepared by PB's Placemaking Group. Sacramento, CA. March 2011

principles of context-sensitive solutions to guide the design of stations. This approach is equally applicable to elevated guideways and will be employed to mitigate visual impacts through context-sensitive design. Aesthetic Guidelines for Non-Station Structures (TM 200-06)³² will also guide design of the HST components. These standards and guidelines work to minimize and avoid aesthetic effects on the adjacent surroundings where possible.

16.0 Cultural and Paleontological Resources Design Features

The California HST Project has considered avoidance and minimization measures consistent with commitments in the Program EIR/EIS documents. Under Section 106 there are several regulatory requirements that must be followed during construction of any federal- and state-funded project, such as halting work in the event of an unanticipated discovery. In addition, mitigation measures have been developed for treatment of adverse effects on compensate for impacts that cannot be avoided. Cultural resources mitigation measures and commitments could occur prior to, during, and following construction. Protective measures, such as conducting archaeological training, building stabilization or archaeological site capping, and recordation of resources will take place prior to construction; other protective measures such as vibration monitoring for built resources or monitoring for archaeological resources during ground disturbing activities will occur during construction. Examples of measures that could take place after construction include interpretive programs, including displays, and interpretive signage.

The Programmatic Agreement (PA) established the framework for the development and implementation of measures to avoid, minimize, or mitigate adverse effects on historic properties caused by the California HST System, in compliance with Section 106 and the National Environmental Policy Act. In accordance with the PA, an Archaeological Treatment Plan (ATP) and a Built Environment Treatment Plan (BETP) have been prepared for the Merced to Fresno Section. The ATP and BETP provide detailed descriptions of treatment measures to avoid, minimize, or mitigate adverse effects caused by the Selected Alternative on historic properties (Section 106) and historical resources (California Environmental Quality Act). The ATP focuses on completion of the identification-level survey, the treatment of known buried historic properties, archaeological monitoring during construction, and provides guidance for unanticipated discoveries. The BETP contains recommended treatments that include, but are not limited to, conditions assessments; research and documentation studies; vibration and noise avoidance measures; and protection and stabilization measures. The ATP and BETP also outline the provisions of the other treatment measures to be implemented for the Selected Alternative, such as responses to unanticipated effects, inadvertent damage or interpretation mitigation.

The ATP and BETP were finalized and approved by the State Historic Preservation Office (SHPO) in a Memorandum of Agreement (MOA) between the Authority, FRA, and SHPO on August 31, 2012. The MOA is tiered from the PA and the Program EIR/EIS documents, and it is an enforceable tool. The MOA was developed in consultation with the SHPO and the Advisory Council on Historic Preservation and includes input from signatories, consulting and concurring parties, and other interested members of the public.

17.0 Regional Growth

None.

³² Authority. 2011. TM 200.06. *Aesthetic Guidelines for Non-Station Structures*. Sacramento, CA. November 3, 2011.

			Required Mitigations				
			Related to Civil Construction ¹	Related to HST Operations ²	Implementing Party and Monitoring/Reporting Party	Implementation / Reporting Schedule	Implementation Mechanism
Merced Station (Between Snelling Highway (SR 59) and Yosemite Parkway (SR 140)) ³							
Intersections							
1	16th St/SR 59	NA	<p>TR MM#4 - Signalize intersection. Provide signal phasing to "overlap" northbound right-turn movement with westbound left-turn movement and westbound right-turn with southbound left-turn movement.</p> <p>TR MM#7, TR MM#8 - Widen northbound approach to add second right-turn lane.</p> <p>TR MM#7, TR MM#8 - Widen westbound approach to add second left-turn lane.</p>	<p>TR MM#4, TR MM#7, TR MM#8 -</p> <p>Implementing Party: Contractor</p> <p>Monitoring/Reporting Party: Contractor</p>	<p>TR MM#4, TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule</p>	<p>TR MM#4, TR MM#7, TR MM#8 - Contract Requirements/Specifications</p>	
3	13th St – SR 99 SB Off-Ramp/V St	NA	<p>TR MM#5 - Restripe the southbound approach (SR 140) from left-turn, through, shared through-right-turn lane to left-turn, shared through-left-turn, and shared through-right-turn lane.</p> <p>TR MM#7, TR MM#8 - Widen SR 99 SB off-ramp to add exclusive right-turn lane.</p>	<p>TR MM#5, TR MM#7, TR MM#8 -</p> <p>Implementing Party: Contractor</p> <p>Monitoring/Reporting Party: Contractor</p>	<p>TR MM#5, TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule</p>	<p>TR MM#5, TR MM#7, TR MM#8 - Contract Requirements/Specifications</p>	
6	16th St/V St	NA	<p>TR MM#6 - Modify signal timing.</p>	<p>TR MM# 6 - Implementing Party: Contractor</p> <p>Monitoring/Reporting Party: Contractor</p>	<p>TR MM# 6 - Prepare construction management plan/maintain weekly reporting schedule</p>	<p>TR MM# 6 - Contract Requirements/Specifications</p>	
14	15th St/M St (Option A only)	NA	<p>TR MM#4 - Signalize intersection (meets signal warrant between 2020 and 2025).</p>	<p>TR MM#4 - Implementing Party: Authority and Contractor (post-construction contractor)</p> <p>Monitoring/Reporting Party: Authority and Contractor (post-construction contractor)</p>	<p>TR MM#4: Annual intersection LOS analysis. Installation of signal when warrant criteria are met.</p>	<p>TR MM#4 - MOU with City of Merced</p>	
18	Childs Ave/Martin Luther King Jr. Way	NA	<p>TR MM#7, TR MM#8 - Widen southbound approach on Childs Avenue to provide exclusive right-turn lane.</p>	<p>TR MM#7, TR MM#8 -</p> <p>Implementing Party: Contractor</p> <p>Monitoring/Reporting Party: Contractor</p>	<p>TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule</p>	<p>TR MM#7, TR MM#8 - Contract Requirements/Specifications</p>	
20	SR 99 SB Ramps/Martin Luther King Jr. Way	NA	<p>TR MM#4 - Signalize intersection.</p>	<p>TR MM#4 - Implementing Party: Contractor</p> <p>Monitoring/Reporting Party: Contractor</p>	<p>TR MM#4 - Prepare construction management plan/maintain weekly reporting schedule</p>	<p>TR MM#4- Contract Requirements/Specifications</p>	
21	SR 99 NB Ramps/Martin Luther King Jr. Way	NA	<p>TR MM#4 - Signalize intersection.</p>	<p>TR MM#4 - Implementing Party: Contractor</p> <p>Monitoring/Reporting Party: Contractor</p>	<p>TR MM#4 - Prepare construction management plan/maintain weekly reporting schedule</p>	<p>TR MM#4- Contract Requirements/Specifications</p>	
22	14th St/Martin Luther King Jr. Way	NA	<p>TR MM#4 - Signalize intersection.</p>	<p>TR MM#4 - Implementing Party: Contractor</p> <p>Monitoring/Reporting Party: Contractor</p>	<p>TR MM#4 - Prepare construction management plan/maintain weekly reporting schedule</p>	<p>TR MM#4- Contract Requirements/Specifications</p>	
24	16th St/Martin Luther King Jr. Way	NA	<p>TR MM#3 - Change northbound/southbound split phasing to protected phasing</p>	<p>TR MM#3 - Implementing Party: Contractor</p> <p>Monitoring/Reporting Party: Contractor</p>	<p>TR MM#3 - Prepare construction management plan/maintain weekly reporting schedule</p>	<p>TR MM#3 - Contract Requirements/Specifications</p>	
25	13th St/G St	NA	<p>TR MM#4 - Signalize intersection.</p> <p>TR MM#5 - Restripe northbound approach from single lane to shared left-through and right-turn lane.</p> <p>TR MM#7, TR MM#8 - Widen eastbound approach to provide a second through lane.</p> <p>TR MM#5 - Restripe westbound approach from an exclusive right-turn lane to a shared through-right-turn lane.</p>	<p>TR MM#4, TR MM#5, TR MM#7, TR MM#8 -</p> <p>Implementing Party: Contractor</p> <p>Monitoring/Reporting Party: Contractor</p>	<p>TR MM#4, TR MM#5, TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule</p>	<p>TR MM#4, TR MM#5, TR MM#7, TR MM#8 - Contract Requirements/Specifications</p>	
26	SR 99 SB Off-Ramp/14th St/G St	NA	<p>TR MM#4 - Signalize intersection.</p>	<p>TR MM#4 - Implementing Party: Contractor</p> <p>Monitoring/Reporting Party: Contractor</p>	<p>TR MM#4 - Prepare construction management plan/maintain weekly reporting schedule</p>	<p>TR MM#4- Contract Requirements/Specifications</p>	

			Required Mitigations				
			Related to Civil Construction ¹	Related to HST Operations ²	Implementing Party and Monitoring/Reporting Party	Implementation / Reporting Schedule	Implementation Mechanism
31	SR 99 NB Off-Ramp/SR 140	NA		TR MM# 4 - Signalize intersection. TR MM# 5 - Restripe eastbound approach to provide a second through lane. TR MM# 7, TR MM# 8 - Widen westbound approach to add a second through lane.	TR MM#4, TR MM#5, TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#4, TR MM#5, TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#4, TR MM#5, TR MM#7, TR MM#8 - Contract Requirements/Specifications
32	Motel Dr/Glen Ave/Yosemite Pkwy (SR 140)	NA		TR MM# 5, TR MM#8 - Restripe southbound approach to provide exclusive right-turn lane and restripe eastbound approach (SR 140) from exclusive right-turn lane to a shared through-right-turn lane.	TR MM#5, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#5, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#5, TR MM#8 - Contract Requirements/Specifications
33	14th St/O St (Option A only)	NA		TR MM#9 - Convert two-way stop controlled intersection to an all-way stop controlled intersection.	TR MM#9 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#9 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#9 - Contract Requirements/Specifications
34	13th St/M St	NA		TR MM#4 - Signalize intersection (meets signal warrant between 2020 and 2025).	TR MM#4 - Implementing Party: Authority and Contractor (post-construction contractor) Monitoring/Reporting Party: Authority and Contractor (post-construction contractor)	TR MM#4 - Annual intersection LOS analysis. Installation of signal when warrant criteria are met.	TR MM#4 - MOU with City of Merced
35	14th St/M St	NA		TR MM#4 - Signalize intersection (meets signal warrant between 2020 and 2025).	TR MM#4 - Implementing Party: Authority and Contractor (post-construction contractor) Monitoring/Reporting Party: Authority and Contractor (post-construction contractor)	TR MM#4 - Annual intersection LOS analysis. Installation of signal when warrant criteria are met.	TR MM#4 - MOU with City of Merced
36	15th St/Canal St	NA		TR MM#4 - Signalize intersection (meets signal warrant between 2020 and 2025).	TR MM#4 - Implementing Party: Authority and Contractor (post-construction contractor) Monitoring/Reporting Party: Authority and Contractor (post-construction contractor)	TR MM#4 - Annual intersection LOS analysis. Installation of signal when warrant criteria are met.	TR MM#4 - MOU with City of Merced
39	16th St/Canal St ⁴	NA		TR MM#5 - Restripe eastbound approach from one shared-through left lane and one exclusive right-turn lane to one exclusive left-turn lane and a shared through-right lane.	TR MM#5, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#5, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#5, TR MM#8 - Contract Requirements/Specifications
40	11th St/Martin Luther King Jr. Way	NA		TR MM#4 - Signalize intersection (meets signal warrant between 2020 and 2025).	TR MM#4 - Implementing Party: Authority and Contractor (post-construction contractor) Monitoring/Reporting Party: Authority and Contractor (post-construction contractor)	TR MM#4 - Annual intersection LOS analysis. Installation of signal when warrant criteria are met.	TR MM#4 - MOU with City of Merced
44	Main St/H St	NA		TR MM#4 - Signalize intersection (meets signal warrant between 2020 and 2025).	TR MM#4 - Implementing Party: Authority and Contractor (post-construction contractor) Monitoring/Reporting Party: Authority and Contractor (post-construction contractor)	TR MM#4 - Annual intersection LOS analysis. Installation of signal when warrant criteria are met.	TR MM#4 - MOU with City of Merced
46	Main St/G St	NA		TR MM#6 - Optimize cycle length.	TR MM# 6 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM# 6 - Prepare construction management plan/maintain weekly reporting schedule	TR MM# 6 - Contract Requirements/Specifications
Roadways							
-	Main St Between Yosemite Pkwy (SR 140) and G St	NA		TR MM#11 - Add one travel lane in each direction.	TR MM#11 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#11 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#11 - Contract Requirements/Specifications
-	16th St Between R St and Martin Luther King Jr. Way	TR MM#11 - Add one travel lane in each direction.	NA		TR MM#11 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#11 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#11 - Contract Requirements/Specifications

		Required Mitigations				
		Related to Civil Construction ¹	Related to HST Operations ²	Implementing Party and Monitoring/Reporting Party	Implementation / Reporting Schedule	Implementation Mechanism
-	V St (Option B only) West of 13th St to 16th St	TR MM#11 - Add one travel lane in each direction.	NA	TR MM#11 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#11 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#11 - Contract Requirements/Specifications
-	M St Between 13th St and 16th St	TR MM#11 - Add one travel lane in each direction.	NA	TR MM#11 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#11 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#11 - Contract Requirements/Specifications
-	V St West of 13th St (Option A only) ⁴	NA	TR MM#11 - Add one travel lane in each direction.	TR MM#11 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#11 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#11 - Contract Requirements/Specifications
-	Martin Luther King Jr. Way Between Childs Ave and 13th St	TR MM#11 - Add one travel lane in each direction.	NA	TR MM#11 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#11 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#11 - Contract Requirements/Specifications
-	G St Between 13th St and 16th St	NA	TR MM#11 - Add one travel lane in each direction.	TR MM#11 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#11 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#11 - Contract Requirements/Specifications
Fresno Area (North of Clinton Ave)						
Between Herndon Ave and Shaw Ave (Intersections)						
1	Golden State Blvd/Santa Ana Ave	TR MM#4 - Signalize intersection (meets signal warrant in 2035). TR MM#7, TR MM#8 - Widen northbound approach to provide dual left-turn lanes and one through lane. TR MM#7 - Widen downstream on Santa Ana Avenue from one receiving lane to two receiving lanes to accommodate the dual left-turn lanes from northbound approach on Golden State Boulevard.	NA	TR MM#4 - Implementing Party: Authority and Contractor (post-construction contractor) Monitoring/Reporting Party: Authority and Contractor (post-construction contractor) TR MM #7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#4 - Annual intersection LOS analysis. Installation of signal when warrant criteria are met. TR MM #7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM #4 - MOU with City of Fresno TR MM #7, TR MM#8 - Contract Requirements/Specifications
2	Cornelia Ave/Shaw Ave	TR MM#4 - Signalize intersection. TR MM#5, TR MM#8 - Restripe eastbound approach to provide one left-turn lane, two through lanes, and one right-turn lane. TR MM#7, TR MM#8 - Widen westbound approach to provide two left-turn lanes, two through lanes and one right-turn lane. TR MM#7, TR MM#8 - Widen northbound approach to provide one left-turn lane, one through lane, and one channelized right-turn. TR MM#7, TR MM#8 - Widen southbound approach to provide one left-turn lane, one through lane, and one right-turn. TR MM#7 - Widen downstream on Cornelia Avenue from one receiving lane to two receiving lanes to accommodate the second left-turn lane from westbound approach on Shaw Avenue.	NA	TR MM#4 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor TR MM #5, TR MM#7, TR MM#8: Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#4: Prepare construction management plan/maintain weekly reporting schedule TR MM #5, TR MM#7, TR MM#8: Prepare construction management plan/maintain weekly reporting schedule	TR MM #4: Contract Requirements/Specifications TR MM #5, TR MM#7, TR MM#8: Contract Requirements/Specifications
5	Blythe Ave/Shaw Ave	TR MM#7, TR MM#8 -Widen eastbound approach to provide a second left-turn lane.	NA	TR MM#7, TR MM#8: Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#7, TR MM#8: Prepare construction management plan/maintain weekly reporting schedule	TR MM#7, TR MM#8: Contract Requirements/Specifications
7	Cornelia Ave/Golden State Blvd	TR MM#4 - Signalize intersection (meets signal warrant in 2035).	NA	TR MM#4 - Implementing Party: Authority and Contractor (post-construction contractor) Monitoring/Reporting Party: Authority and Contractor (post-construction contractor)	TR MM#4: Annual intersection LOS analysis. Installation of signal when warrant criteria are met.	TR MM #4: MOU with City of Fresno

		Required Mitigations				
		Related to Civil Construction ¹	Related to HST Operations ²	Implementing Party and Monitoring/Reporting Party	Implementation / Reporting Schedule	Implementation Mechanism
9	Figarden Dr/Bullard Ave	TR MM#5 - Restripe westbound approach to provide two left-turn lanes, one through lane and one right-turn lane.	NA	TR MM #5: Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM #5: Prepare construction management plan/maintain weekly reporting schedule	TR MM #5: Contract Requirements/Specifications
14	Veterans Blvd/Bullard Ave	TR MM#5 - Restripe eastbound approach to provide one left-turn lane and two right-turn lanes. TR MM#5 - Restripe northbound approach to provide three left-turn lanes and one through lane. TR MM#6 - Modify signal timing. TR MM#10 - Grade separate through movement on Veterans Boulevard.	NA	TR MM #5, TR MM#6: Implementing Party: City of Fresno Monitoring/Reporting Party: City of Fresno TR MM#10: City of Fresno	TR MM #5, TR MM#6: City of Fresno TR MM#10: City of Fresno	TR MM #5, TR MM#6: MOU with City of Fresno TR MM#10: MOU with City of Fresno
15	Veterans Blvd/Golden State Blvd Connector	TR MM#5 - Restripe eastbound approach to provide one left-turn lane and four through lanes. TR MM#7, TR MM#8 - Widen westbound approach to provide additional left-turn lane and a through lane. TR MM#3 - Modify northbound and southbound right-turn as free movements.	NA	TR MM #3, TR MM#5, TR MM#7, TR MM#8: Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM #3, TR MM#5, TR MM#7, TR MM#8: Prepare construction management plan/maintain weekly reporting schedule	TR MM #3, TR MM#5, TR MM#7, TR MM#8: Contract Requirements/Specifications
Between Herndon Ave and Shaw Ave (Roadways)						
-	Veterans Blvd between Golden State Blvd and Bullard Ave	TR MM#11 - Add one lane in each direction.		TR MM#11: City of Fresno	TR MM#11: City of Fresno	TR MM#11: MOU with City of Fresno
SR 99 Realignment (Intersections)						
5	Clinton Ave/Brawley Ave	TR MM#7, TR MM#8 - Widen southbound approach to provide second left-turn lane.	NA	TR MM#7, TR MM#8 - Implementing Party: Caltrans Monitoring/Reporting Party: Caltrans	TR MM#7, TR MM#8 - Caltrans	TR MM#7, TR MM#8 - MOU with Caltrans
6	Clinton Ave/Marks Ave	TR MM#7, TR MM#8 - Widen northbound approach to provide exclusive northbound right-turn lane. TR MM#5 - Restripe southbound approach to include two left-turn lanes and one shared through-right-turn lane.	NA	TR MM#5, TR MM#7, TR MM#8 - Implementing Party: Caltrans Monitoring/Reporting Party: Caltrans	TR MM#5, TR MM#7, TR MM#8 - Caltrans	TR MM#5, TR MM#7, TR MM#8 - MOU with Caltrans
8	Clinton Ave/SR 99 SB Ramps	TR MM#7, TR MM#8 - Widen eastbound approach to provide exclusive eastbound right-turn lane.	NA	TR MM#7, TR MM#8 - Implementing Party: Caltrans Monitoring/Reporting Party: Caltrans	TR MM#7, TR MM#8 - Caltrans	TR MM#7, TR MM#8 - MOU with Caltrans
10	Clinton Ave/Weber Ave	TR MM#7, TR MM#8 - Widen southbound approach to provide second left-turn lane. TR MM#7, TR MM#8 - Widen eastbound approach to provide second left-turn lane.	NA	TR MM#7, TR MM#8 - Implementing Party: Caltrans Monitoring/Reporting Party: Caltrans	TR MM#7, TR MM#8 - Caltrans	TR MM#7, TR MM#8 - MOU with Caltrans
14	Shields Ave/Brawley Ave	TR MM#4 - Signalize intersection.	NA	TR MM#4 - Implementing Party: Caltrans Monitoring/Reporting Party: Caltrans	TR MM#4 - Caltrans	TR MM#4 - MOU with Caltrans
15	Dakota Ave/Brawley Ave	TR MM#4 - Signalize intersection. TR MM#5 - Restripe northbound approach to include exclusive left-turn lane and shared through-right-turn lane. TR MM#5 - Restripe westbound approach to include exclusive left-turn lane and shared through-right-turn lane. TR MM#7, TR MM#8 - Widen southbound approach to include exclusive left-turn, through and exclusive right-turn lanes. TR MM#7, TR MM#8 - Widen eastbound approach to include exclusive left-turn and shared through-right-turn lane.	NA	TR MM#4 - Implementing Party: Caltrans Monitoring/Reporting Party: Caltrans TR MM#5, TR MM#7, TR MM#8 - Implementing Party: Caltrans Monitoring/Reporting Party: Caltrans	TR MM#4 - Caltrans TR MM#5, TR MM#7, TR MM#8 - Caltrans	TR MM#4 - MOU with Caltrans TR MM#5, TR MM#7, TR MM#8 - MOU with Caltrans
16	Ashlan Ave – SR 99 SB Ramps/Parkway Dr	TR MM#7, TR MM#8 - Add second northbound right-turn lane.	NA	TR MM#7, TR MM#8 - Implementing Party: Caltrans Monitoring/Reporting Party: Caltrans	TR MM#7, TR MM#8 - Caltrans	TR MM#7, TR MM#8 - MOU with Caltrans

		Required Mitigations				
		Related to Civil Construction ¹	Related to HST Operations ²	Implementing Party and Monitoring/Reporting Party	Implementation / Reporting Schedule	Implementation Mechanism
SR 99 Realignment (Freeway)						
-	SR 99 SB, south of Clinton Ave to Olive Ave	TR MM#2 - Add SB Auxillary lane	NA	TR MM#2 - Implementing Party: Caltrans Monitoring/Reporting Party: Caltrans	TR MM#2: Caltrans	TR MM#2: MOU with Caltrans
Fresno Area (South of Clinton) - Between McKinley Ave and SR 180						
Intersections						
5	W Olive Ave /SR 99 SB Ramps	TR MM#7, TR MM#8 - Widen southbound approach to provide additional left-turn lane.	NA	TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#7, TR MM#8 - Contract Requirements/Specifications
6	W Olive Ave /SR 99 NB Ramps	TR MM#7, TR MM#8 - Widen northbound approach to provide exclusive left-turn lane	NA	TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#7, TR MM#8 - Contract Requirements/Specifications
7	W Olive Ave/N West Ave	TR MM#4 - Signalize intersection.	NA	TR MM#4 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#4 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#4 - Contract Requirements/Specifications
10	W Belmont Ave /SR 99 SB Ramps	TR MM#4 - Signalize intersection.	NA	TR MM#4 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#4 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#4 - Contract Requirements/Specifications
11	W Belmont Ave /SR 99 NB Ramps	TR MM#4 - Signalize intersection.	NA	TR MM#4 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#4 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#4 - Contract Requirements/Specifications
Between McKinley Ave and SR 180 (Roadways)						
-	W Olive Ave, between SR 99 Ramps and N West Ave	TR MM#11 - Add one lane in each direction.	NA	TR MM#11 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#11 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#11 - Contract Requirements/Specifications
-	W Belmont Ave, between N Arthur Ave and SR 99 Ramps	TR MM#11 - Add one lane in each direction.	NA	TR MM#11 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#11 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#11 - Contract Requirements/Specifications
Fresno Station (Between SR 180 and SR 41) ⁵						
Intersections						
2	Van Ness Ave/SR 41 NB Ramp	NA	TR MM#5, TR MM#8 - Restripe the eastbound approach to provide one exclusive left-turn lane and one shared left/through/right-turn lane at the intersection.	TR MM#5, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#5, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#5, TR MM#8 - Contract Requirements/Specifications
6	SR 99 NB Ramps/Ventura Ave	NA	TR MM#4 - Signalize intersection (meets signal warrant by 2035).	TR MM#4 - Implementing Party: Authority and Contractor (post-construction contractor) Monitoring/Reporting Party: Authority and Contractor (post-construction contractor)	TR MM#4: Annual intersection LOS analysis. Installation of signal when warrant criteria are met.	TR MM #4: MOU with City of Fresno

		Required Mitigations				
		Related to Civil Construction ¹	Related to HST Operations ²	Implementing Party and Monitoring/Reporting Party	Implementation / Reporting Schedule	Implementation Mechanism
7	E St/Ventura Ave	TR MM#4 - Signalize intersection (meets signal warrant by 2035).	NA	TR MM#4 - Implementing Party: Authority and Contractor (post-construction contractor) Monitoring/Reporting Party: Authority and Contractor (post-construction contractor)	TR MM#4: Annual intersection LOS analysis. Installation of signal when warrant criteria are met.	TR MM #4: MOU with City of Fresno
9	Broadway Ave/Ventura Ave	Tulare Street Underpass Option: TR MM#7, TR MM#8 - Widen the northbound approach to add one exclusive right-turn, one left-turn lane, and one through lane. TR MM#3 - Modify signal phasing to provide protected left-turn phases for the northbound and southbound approaches. Tulare Street Overpass Option: TR MM#7, TR MM#8 - Widen the eastbound approach to add two exclusive left-turn lanes, two through lanes, and one exclusive right-turn lane. TR MM#3 - Modify signal phasing to provide protected left-turn phases for the northbound and southbound approaches.	NA	TR MM#3 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#3 - Prepare construction management plan/maintain weekly reporting schedule TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#3 - Contract Requirements/Specifications TR MM#7, TR MM#8 - Contract Requirements/Specifications
10	Van Ness Ave/Ventura St	NA	TR MM#3 - Modify the existing traffic signal phasing to provide protected left-turn phases for the northbound and southbound approaches.	TR MM#3 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#3 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#3 - Contract Requirements/Specifications
21	H St/Kern St (Tulare Street Underpass Option only)	NA	TR MM#7, TR MM#8 - Widen the eastbound approach to provide one exclusive left-turn lane and one exclusive right-turn lane at the intersection.	TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#7, TR MM#8 - Contract Requirements/Specifications
22	E St/Tulare St (Tulare Street Overpass Option only)	NA	TR MM#7, TR MM#8 - Widen the southbound approach to provide one exclusive left-turn lane and one shared through/right-turn lane. TR MM#7, TR MM#8 - Widen the westbound approach to provide one exclusive left-turn lane, one through lane, and one exclusive right-turn lane. TR MM#3 - Modify signal phasing to provide protected left-turn phases for the eastbound and westbound approaches.	TR MM#3 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#3 - Prepare construction management plan/maintain weekly reporting schedule TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#3 - Contract Requirements/Specifications TR MM#7, TR MM#8 - Contract Requirements/Specifications
23	F St/Tulare St (Tulare Street Underpass Option only)	TR MM#7, TR MM#8 - Widen the northbound approach to provide one exclusive left-turn and one shared through/right-turn lane. TR MM#7, TR MM#8 - Widen the southbound approaches to provide one exclusive left-turn lane, and one shared through/right-turn lane. TR MM#7, TR MM#8 - Widen the westbound approach to provide one exclusive right-turn lane, one exclusive left-turn lane, and one through lane. TR MM#3 - Modify signal phasing to provide protected left-turn phases for all approaches.	NA	TR MM#3 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#3 - Prepare construction management plan/maintain weekly reporting schedule TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#3 - Contract Requirements/Specifications TR MM#7, TR MM#8 - Contract Requirements/Specifications
25	H St/Tulare St (Tulare Street Underpass Option only)	TR MM#7, TR MM#8 - Widen westbound approach to provide one exclusive right-turn lane, one exclusive left-turn lane, and two through lanes. TR MM#7, TR MM#8 - Widen northbound approach to provide one exclusive right-turn lane, one exclusive left-turn lanes, and two through lanes. TR MM#7, TR MM#8 - Widen southbound approach to provide one exclusive right-turn lane, one exclusive left-turn lane, and two through lanes. TR MM#3 - Modify signal phasing to provide protected left-turn phases for all approaches.	NA	TR MM#3 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#3 - Prepare construction management plan/maintain weekly reporting schedule TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#3 - Contract Requirements/Specifications TR MM#7, TR MM#8 - Contract Requirements/Specifications
26	Van Ness Ave/Tulare St (Tulare Street Underpass Option only)	NA	TR MM#7, TR MM#8 - Widen the westbound approach to provide one exclusive left-turn lane, two through lanes, and one exclusive right-turn lane at the intersection.	TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#7, TR MM#8 - Contract Requirements/Specifications

			Required Mitigations				
			Related to Civil Construction ¹	Related to HST Operations ²	Implementing Party and Monitoring/Reporting Party	Implementation / Reporting Schedule	Implementation Mechanism
30	U St/Tulare St	NA		TR MM#3 - Modify the existing traffic signal phasing to provide protected left-turn phases for the eastbound and westbound approaches.	TR MM#3 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#3 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#3 - Contract Requirements/Specifications
33-0	Divisadero Street/SR 41 NB Ramps/Tulare Street ⁴	NA		TR MM#6 - Retime the existing signal in AM	TR MM# 6 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM# 6 - Prepare construction management plan/maintain weekly reporting schedule	TR MM# 6 - Contract Requirements/Specifications
37	SR 99 SB Ramps/Fresno St	NA		TR MM#7, TR MM#8 - Widen the eastbound approach to provide two exclusive through lanes and one exclusive right-turn lane at the intersection.	TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#7, TR MM#8 - Contract Requirements/Specifications
38	SR 99 NB Ramps/Fresno St	NA		Tulare Street Underpass Option: TR MM#5, TR MM#8 - Restripe the eastbound approach to provide two exclusive left-turn lanes and one exclusive through lane. Tulare Street Overpass Option: TR MM#5, TR MM#8 - Restripe the westbound approach to provide one through lane, one shared through/right-turn lane, and one exclusive right-turn lane.	TR MM#5, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#5, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#5, TR MM#8 - Contract Requirements/Specifications
42	Van Ness Avenue/Fresno St	NA		Tulare Street Underpass Option: TR MM#7, TR MM#8 - Widen the southbound approach to provide one exclusive left-turn lane, one exclusive through lane, and one exclusive right-turn lane at the intersection. Tulare Street Overpass Option: TR MM#7, TR MM#8 - Widen the northbound approach to provide two exclusive left-turn lanes, one through lane, and one shared through/right-turn lane. TR MM#7, TR MM#8 - Widen the eastbound approach to provide two exclusive left-turn lanes, one through lane, and one shared through/right-turn lane.	TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#7, TR MM#8 - Contract Requirements/Specifications
46	Fresno St/Divisadero St	NA		TR MM#3 - Modify the existing traffic signal to provide split phases for the eastbound and westbound approaches at the intersection.	TR MM#3 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#3 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#3 - Contract Requirements/Specifications
50	Van Ness Ave/Tuolumne St	TR MM#7, TR MM#8 - Widen eastbound approach to provide one exclusive left-turn lane, one through lane and one exclusive right-turn lane	NA		TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#7, TR MM#8 - Contract Requirements/Specifications
52	E St/Stanislaus St (Tulare Street Overpass Option only)	TR MM#5, TR MM#8 - Restripe the westbound approach to provide one shared left/through lane, two through lanes, and one shared through/right-turn lane. TR MM#5, TR MM#8 - Restripe the southbound approach to provide one shared left/through lane and one exclusive right-turn lane. TR MM#3 - Modify signal phasing to provide split phasing on eastbound and westbound approaches.	NA		TR MM#3 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor TR MM#5, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#3 - Prepare construction management plan/maintain weekly reporting schedule TR MM#5, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#3 - Contract Requirements/Specifications TR MM#5, TR MM#8 - Contract Requirements/Specifications
53	Broadway St/Stanislaus St (Tulare Street Overpass Option only)	TR MM#5, TR MM#8 - Restripe the southbound approach to provide shared left/through lane and one exclusive right-turn lane. TR MM#3 - Modify signal phasing to provide permissive phase on northbound and southbound approaches.	NA		TR MM#3 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor TR MM#5, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#3 - Prepare construction management plan/maintain weekly reporting schedule TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#3 - Contract Requirements/Specifications TR MM#7, TR MM#8 - Contract Requirements/Specifications

		Required Mitigations				
		Related to Civil Construction ¹	Related to HST Operations ²	Implementing Party and Monitoring/Reporting Party	Implementation / Reporting Schedule	Implementation Mechanism
54	Van Ness Ave/Stanislaus St (Tulare Street Underpass Option only)	TR MM#7, TR MM#8 - Widen westbound approach to provide one exclusive left-turn lane, one through lane and one shared through/right-turn lane	NA	TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#7, TR MM#8 - Contract Requirements/Specifications
58	H St/San Joaquin St	TR MM#4 - Signalize intersection (meets signal warrant after 2035).	NA	TR MM#4 - Implementing Party: Authority and Contractor (post-construction contractor) Monitoring/Reporting Party: Authority and Contractor (post-construction contractor)	TR MM#4: Annual intersection LOS analysis. Installation of signal when warrant criteria are met.	TR MM #4: MOU with City of Fresno
60	H St/Amador St	TR MM#4 - Signalize intersection (meets signal warrant by 2035). TR MM#7, TR MM#8 - Widen southbound approach to provide one exclusive left-turn lane and one through lane.	NA	TR MM#4 - Implementing Party: Authority and Contractor (post-construction contractor) Monitoring/Reporting Party: Authority and Contractor (post-construction contractor) TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#4: Annual intersection LOS analysis. Installation of signal when warrant criteria are met. TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM #4: MOU with City of Fresno TR MM#7, TR MM#8 - Contract Requirements/Specifications
63	H Street/Divisadero Street	TR MM#5, TR MM#8 - Restripe the westbound approach to provide one shared through/right/left-turn lane and two exclusive right-turn lanes. TR MM#7, TR MM#8 - Widen the northbound approach to provide two exclusive left-turn lanes and one shared through/right-turn lane. TR MM#7, TR MM#8 - Widen the southbound approach to provide additional left-turn lane (on H St).	NA	TR MM#5, TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#5, TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#5, TR MM#7, TR MM#8 - Contract Requirements/Specifications
66	Van Ness Ave/Divisadero St	NA	TR MM#7, TR MM#8 - Widen the eastbound approach to provide one shared left/through lane, one exclusive through lane, and one exclusive right-turn lane at the intersection. TR MM#7, TR MM#8 - Widen the westbound approach to provide one shared left/through lane, one exclusive through lane, and one exclusive right-turn lane at the intersection.	TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#7, TR MM#8 - Contract Requirements/Specifications
67	H St/Roosevelt St	TR MM#7, TR MM#8 - Widen the westbound approach (H St) to provide one shared through/right-turn lane, one exclusive through lane, and one exclusive left-turn lane.	NA	TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#7, TR MM#8 - Contract Requirements/Specifications
68	N Blackstone Ave/E McKenzie Ave	NA	TR MM#7, TR MM#8 - Widen the westbound approach to provide one exclusive left-turn lane and one exclusive through lane.	TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#7, TR MM#8 - Contract Requirements/Specifications
71	Van Ness Ave/SR 180 EB Ramps	NA	TR MM#5, TR MM#8 - Restripe the northbound approach to provide one exclusive through lane, one shared through/right-turn lane, and one exclusive right-turn lane at the intersection.	TR MM#5, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#5, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#5, TR MM#8 - Contract Requirements/Specifications
73	Van Ness Ave/SR 180 WB Ramps	NA	TR MM#7, TR MM#8 - Widen the eastbound approach to provide one additional exclusive left-turn lane at the intersection.	TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#7, TR MM#8 - Contract Requirements/Specifications
74	N Blackstone Ave/E Belmont Ave	NA	TR MM#7, TR MM#8 - Widen the southbound approach to provide one exclusive left-turn lane, two exclusive through lanes, and one shared through/right-turn lane at the intersection.	TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#7, TR MM#8 - Contract Requirements/Specifications
79	N Abby St/SR 180 EB Ramps	NA	TR MM#5, TR MM#8 - Re-stripe the northbound approach to provide one shared left/through lane, one exclusive through lane, one shared through/right-turn lane, and one exclusive right-turn lane at the intersection.	TR MM#5, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#5, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#5, TR MM#8 - Contract Requirements/Specifications

			Required Mitigations				
			Related to Civil Construction ¹	Related to HST Operations ²	Implementing Party and Monitoring/Reporting Party	Implementation / Reporting Schedule	Implementation Mechanism
80	N Blackstone Ave/SR 180 WB Ramps	NA		TR MM#7, TR MM#8 - Widen the eastbound approach to provide one additional exclusive right-turn lane at the intersection.	TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#7, TR MM#8 - Contract Requirements/Specifications
81	Broadway St/Amador St	TR MM#4 - Signalize intersection (meets signal warrant by 2035).	NA		TR MM#4 - Implementing Party: Authority and Contractor (post-construction contractor) Monitoring/Reporting Party: Authority and Contractor (post-construction contractor)	TR MM#4: Annual intersection LOS analysis. Installation of signal when warrant criteria are met.	TR MM #4: MOU with City of Fresno
83	Fresno St/F St	Tulare Street Underpass Option: TR MM#5, TR MM#8 - Restripe the northbound approach to provide one exclusive left-turn lane, one exclusive through lane, and one shared through/right-turn lane. TR MM#7, TR MM#8 - Widen the westbound approach to provide one exclusive left-turn lane, two through lanes, and one exclusive right-turn lane. TR MM#7, TR MM#8 - Widen the eastbound approach to provide two exclusive left-turn lanes, one through lane, and one shared through/right-turn lane. Tulare Street Overpass Option: TR MM#5, TR MM#8 - Restripe the northbound approach to provide one exclusive left-turn lane, one exclusive through lane, and one shared through/right-turn lane. TR MM#7, TR MM#8 - Widen the westbound approach to provide one exclusive left-turn lane, one through lane, one share through/right-turn lane, and one exclusive right-turn lane. TR MM#7, TR MM#8 - Widen the eastbound approach to provide two exclusive left-turn lanes, one through lane, and one shared through/right-turn lane.	NA		TR MM#5, TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#5, TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#5, TR MM#7, TR MM#8 - Contract Requirements/Specifications
84	G St/Mono St (Tulare Street Underpass Option only)	TR MM#4 - Signalize intersection (meets signal warrant by 2035).	NA		TR MM#4 - Implementing Party: Authority and Contractor (post-construction contractor) Monitoring/Reporting Party: Authority and Contractor (post-construction contractor)	TR MM#4: Annual intersection LOS analysis. Installation of signal when warrant criteria are met.	TR MM #4: MOU with City of Fresno
86	H St/Ventura St (Tulare St Underpass Option Only)	TR MM#4 - Signalize intersection.	NA		TR MM#4 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#4: Prepare construction management plan/maintain weekly reporting schedule	TR MM #4: Contract Requirements/Specifications
92	S Van Ness Ave/E California Ave	TR MM#4 - Signalize intersection (meets signal warrant by 2035). TR MM#7, TR MM#8 - Widen northbound approach to provide exclusive left-turn lane. TR MM#7, TR MM#8 - Widen southbound approach to provide exclusive left-turn lane. TR MM#3 - Modify signal phasing on northbound and southbound approaches to provide protected plus permissive left-turn phasing.	NA		TR MM#3 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor TR MM#4 - Implementing Party: Authority and Contractor (post-construction contractor) Monitoring/Reporting Party: Authority and Contractor (post-construction contractor) TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#3 - Prepare construction management plan/maintain weekly reporting schedule TR MM#4: Annual intersection LOS analysis. Installation of signal when warrant criteria are met. TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#3 - Contract Requirements/Specifications TR MM #4: MOU with City of Fresno TR MM#7, TR MM#8 - Contract Requirements/Specifications

		Required Mitigations				
		Related to Civil Construction ¹	Related to HST Operations ²	Implementing Party and Monitoring/Reporting Party	Implementation / Reporting Schedule	Implementation Mechanism
96	Golden State Blvd/E Church Ave	TR MM#7, TR MM#8 - Provide an exclusive right-turn lane in the northbound direction. TR MM#3 - Modify signal phasing on all approaches to provide protected plus permissive left-turn phase.	NA	TR MM#3 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#3 - Prepare construction management plan/maintain weekly reporting schedule TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#3 - Contract Requirements/Specifications TR MM#7, TR MM#8 - Contract Requirements/Specifications
101	S East Ave/Golden State Blvd	TR MM#6 - Increase cycle length (in the PM Peak Hour only).	NA	TR MM#6 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#6 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#6 - Contract Requirements/Specifications
102	Golden State Blvd/E Jensen Ave	TR MM#8 - Provide an exclusive right-turn lane for both northbound and southbound approaches.	NA	TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#8 - Contract Requirements/Specifications
109	Stanislaus St/F St	(Tulare Street Overpass Option only) TR MM#7, TR MM#8 - Widen the northbound approach to provide one exclusive left-turn lane and two exclusive right-turn lanes.	NA	TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#7, TR MM#8 - Contract Requirements/Specifications
110	Tuolumne St/F St (Tulare Street Overpass Option only)	TR MM#5, TR MM#8 - Restripe the eastbound approach to provide one exclusive left-turn lane, one shared left/through lane and one exclusive right-turn lane.	NA	TR MM#5, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#5, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#5, TR MM#8 - Contract Requirements/Specifications
113	Stanislaus St/L St	TR MM#7, TR MM#8 - Widen the northbound approach to provide one exclusive left-turn lane and one shared through/right-turn lane.	NA	TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#7, TR MM#8 - Contract Requirements/Specifications
115	Stanislaus St/M St	TR MM#7, TR MM#8 - Widen the southbound approach to provide one shared left/through lane and one exclusive right-turn lane.	NA	TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#7, TR MM#8 - Contract Requirements/Specifications
117	Stanislaus St/N St	TR MM#7, TR MM#8 - Widen the westbound approach to provide one exclusive left-turn lane, one through lane and one shared through/right-turn lane.	NA	TR MM#7, TR MM#8 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#7, TR MM#8 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#7, TR MM#8 - Contract Requirements/Specifications

		Required Mitigations				
		Related to Civil Construction ¹	Related to HST Operations ²	Implementing Party and Monitoring/Reporting Party	Implementation / Reporting Schedule	Implementation Mechanism
Roadways						
-	H St Between East Divisadero St and Stanislaus St	TR MM#11 - Add one travel lane in each direction.	NA	TR MM#11 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#11 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#11 - Contract Requirements/Specifications
-	Stanislaus St Between Broadway St and E St	TR MM#11 - Add one travel lane in each direction.	NA	TR MM#11 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#11 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#11 - Contract Requirements/Specifications
-	Fresno St Between Van Ness Ave and Broadway St (Tulare Street Overpass Option only)	NA	TR MM#11 - Add one travel lane in each direction.	TR MM#11 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#11 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#11 - Contract Requirements/Specifications
-	Fresno St Between G St and SR 99 NB Ramps	TR MM#11 - Add one travel lane in each direction.	NA	TR MM#11 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#11 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#11 - Contract Requirements/Specifications
-	Tulare St Between Broadway St and Van Ness Avenue (Tulare Street Underpass Option only)	NA	TR MM#11 - Add one travel lane in each direction.	TR MM#11 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#11 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#11 - Contract Requirements/Specifications
-	Divisadero St Between N. Fresno St and SR 41 Ramps		TR MM#11 - Add one travel lane in each direction.	TR MM#11 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#11 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#11 - Contract Requirements/Specifications
-	Van Ness Ave Between Ventura Ave and SR 41 Ramps (Tulare Street Overpass Option only)	TR MM#11 - Add one travel lane in each direction.	NA	TR MM#11 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#11 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#11 - Contract Requirements/Specifications
-	Stanislaus St Between E St and F St (Tulare Street Overpass Option only)	TR MM#11 - Add one travel lane in each direction.	NA	TR MM#11 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#11 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#11 - Contract Requirements/Specifications
-	F St Between Stanislaus St and Tuolumne St (Tulare Street Overpass Option only)	TR MM#11 - Add one travel lane in each direction.	NA	TR MM#11 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#11 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#11 - Contract Requirements/Specifications
-	Stanislaus St Between G St and H St (Tulare Street Overpass Option only)	TR MM#11 - Add one travel lane in each direction.	NA	TR MM#11 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#11 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#11 - Contract Requirements/Specifications
-	Stanislaus St Between Broadway St and Fulton St	TR MM#11 - Add one travel lane in each direction.	NA	TR MM#11 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#11 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#11 - Contract Requirements/Specifications
-	Stanislaus St Between L St and M St (Tulare Street Underpass Option only)	TR MM#11 - Add one travel lane in each direction.	NA	TR MM#11 - Implementing Party: Contractor Monitoring/Reporting Party: Contractor	TR MM#11 - Prepare construction management plan/maintain weekly reporting schedule	TR MM#11 - Contract Requirements/Specifications

Notes:

- 1 Mitigation measures indicated under this category occur with the roadway modifications due to the proposed HST alignment.
- 2 Mitigation measures indicated under this category are due to the HST station operations.
- 3 In the vicinity of Merced Station, all locations are impacted under both parking options A and B, unless otherwise specified.
- 4 Location impacted under Existing + Project conditions only.
- 5 In the vicinity of Fresno Station, all locations are impacted under both Tulare Street Underpass and Overpass options, unless otherwise specified.