

# **BART WARM SPRINGS EXTENSION FINAL SUPPLEMENTAL EIR – ADDENDUM 2 Modifications to Irvington Station and Gallegos Winery Components**

**San Francisco Bay Area Rapid Transit District**

July 2019

## **APPENDIX A: 2006 MITIGATION MONITORING AND REPORTING PLAN FOR THE BART WARM SPRINGS EXTENSION**

Prepared by:  
San Francisco Bay Area Rapid Transit District  
Amended September 2006





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## **SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT**

### **Mitigation Monitoring and Reporting Plan for the BART Warm Springs Extension**

Amended September 2006

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Mitigation Monitoring and Reporting Plan for the BART Warm Springs Extension.  
Amended September 2006. Oakland, CA. Prepared by the San Francisco Rapid Transit  
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# Section 1

## Introduction

### 1.1. Purpose and Need for Monitoring

The BART Warm Springs Extension project (Project) has been subject to three environmental evaluations.<sup>1</sup> The first evaluation was the *BART Warm Springs Extension Environmental Impact Report*, which was certified on September 15, 1992. The second evaluation was the *Supplemental Environmental Impact Report-BART Warm Springs Extension* (SEIR), which was certified on June 26, 2003. The first two evaluations were prepared to comply with the California Environmental Quality Act (CEQA). The third evaluation is the *Environmental Impact Statement and 4(f)/6(f) Evaluation-BART Warm Springs Extension* (EIS), which was prepared to comply with the National Environmental Policy Act (NEPA). The EIS was signed by the Federal Transit Administration on May 16, 2006, and the Notice of Availability was published in the Federal Register on July 14, 2006. The environmental analyses identified potential impacts and measures to mitigate those impacts wherever feasible. Impacts were identified in the following areas:

- Transportation.
- Geology, Soils, and Seismicity
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Wetlands
- Biological Resources
- Land Use and Planning
- Parks and Recreation
- Population, Employment, and Housing
- Aesthetics
- Cultural Resources
- Noise and Vibration.
- Air Quality.

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<sup>1</sup>For the purposes of this Mitigation Monitoring and Reporting Plan, the terms *Project* and *WSX Alternative* are synonymous.

- Energy.
- Utilities and Public Services
- Safety and Security

This Mitigation Monitoring and Reporting Plan (MMRP) identifies the mitigation actions that will be performed by BART to compensate for, reduce, minimize, or eliminate the effect of impacts resulting from construction and operation of the Project. Because the 2006 EIS is the most recent and comprehensive environmental evaluation, most of the mitigation measures are from that document. However, in a few cases, a 2003 SEIR mitigation measure was more stringent than the corresponding measure in the 2006 EIS and was therefore retained in this MMRP as explained below. For example, for the area of noise and vibration, the 2003 SEIR mitigation measures were used, because they are based on BART criteria that are considered more stringent than the Federal Transit Administration (FTA) criteria used in the 2006 EIS.

This Mitigation Monitoring and Reporting Plan (MMRP) was prepared pursuant to the requirements of California Public Resources Code Section 21081.6, which requires a public agency to adopt a monitoring and/or reporting program to ensure compliance with mitigation measures during project implementation. This MMRP identifies and clarifies the mitigation measures to be implemented by BART for the Project and identifies the parties responsible for implementation and monitoring. This MMRP incorporates all mitigation measures identified.

## 1.2. Project Description

The Project consists of a 5.4-mile extension of the BART system south from the existing Fremont BART Station to a proposed new station in the Warm Springs district of the City of Fremont. The Project alignment would generally parallel portions of the Union Pacific (UP) railroad corridor, which contains railroad tracks formerly belonging to the Western Pacific (WP) and Southern Pacific (SP), and Interstate 680 (I-680) and Interstate 880 (I-880) in southern Alameda County. The initial segment would begin on an embankment at the southern end of the existing elevated Fremont BART Station. The alignment would pass over Walnut Avenue on an aerial structure and descend into a cut-and-cover subway north of Stevenson Boulevard. The alignment would continue southward in the subway structure under Fremont Central Park and the eastern arm of Lake Elizabeth, and surface to at grade between the former WP and SP alignments north of Paseo Padre Parkway. Paseo Padre Parkway will be reconfigured as a vehicular underpass as part of the Washington Boulevard and Paseo Padre Parkway Railroad Grade Separations Project, referred to herein as the city's grade separation project. The alignment would pass over Paseo Padre Parkway on a bridge structure, and then continue southward at grade, passing under a grade-separated Washington Boulevard. Washington Boulevard will be reconfigured as a vehicular overpass as part of the city's grade separation project. From Washington Boulevard, the Project alignment would continue at grade along the former WP alignment south to a terminus station at Warm Springs and South Grimmer Boulevards in the Warm Springs district. An optional station at Irvington also is proposed. The optional Irvington Station would be located on Osgood Road, just south of and adjacent to Washington Boulevard.



The analysis of the Project presented in the 2003 SEIR focused on updating and supplementing the information contained in the 1992 EIR based on changes that have occurred in the project setting and any new information related to the project that was not known at the time the original EIR was published and the project was adopted. The 2006 EIS satisfied the requirements of other environmental laws that apply to federal actions, such as Section 4(f) of the Department of Transportation Act (49 U.S.C. Section 303), Section 6(f) of the Land and Water Conservation Fund (LWCF), and Section 106 of the National Historic Preservation Act (NHPA).

### **1.3. Mitigation Monitoring Program**

This MMRP has been prepared for the Warm Springs Extension (WSX) Project in accordance with California Public Resources Code 21081.6, which specifies that when a public agency makes findings required by paragraph (1) of subdivision (a) of Section 21081, it “...shall adopt a reporting or monitoring program for the changes made to the project or conditions of project approval, adopted in order to mitigate or avoid significant effects on the environment.” Public Resources Code 21081.6 further specifies that the MMRP will “...ensure compliance during project implementation.” This MMRP is intended to ensure the effective implementation of mitigation measures that are within the authority of BART to implement, including monitoring where identified, throughout all phases of development and operation of the Project.

### **1.4. Mitigation Actions**

BART’s Manager of Environmental Compliance will be responsible for oversight of the implementation of mitigation actions and reporting on compliance with this plan to the BART Board of Directors. Mitigation actions required to be performed prior to and during project construction will be performed by BART staff, by consultants to BART, or by the contractors who will construct the Project under the oversight of BART staff. Any actions that require implementation after construction will be performed by BART staff, by consultants to BART, or by contractors to BART.

### **1.5. Procedures for Monitoring and Reporting**

Monitoring and reporting procedures will conform to the following steps prior to and during project construction and operations.

#### **Step 1. Monitoring**

This step will be executed by the Monitor. The Monitor will be designated by BART’s Environmental Compliance Division. Monitoring activities may be performed by the Environmental Compliance Manager, by BART staff, or the Monitor may be a consultant to BART.

The Monitor will have the following responsibilities.

- Prepare an implementation plan prior to commencement of construction to augment and detail the monitoring actions and compliance requirements listed in this MMRP.

- Be knowledgeable in the mitigation that is to be monitored.
- Verify implementation of mitigation by:
  - verifying prior to advertisement for contract bids that bid documents, contracts, and other plans and specifications include requirements to implement identified mitigation measures;
  - verifying in the field that required implementation has been properly executed during and after construction; and
  - contacting the Project Manager and requesting that the situation be remedied if mitigation is not being implemented or executed properly. This action will be accomplished with formal notification via an Environmental Non Conformance Report (ENCR) process, which requires formal response.
- Prepare Mitigation Status Forms and submit to appropriate BART management.

## Step 2. Action

This step will be executed by the Transit System Development (TSD) Project Manager (PM ). The PM will be appointed by the Executive Manager of TSD.

The PM will have the following responsibilities.

- Review the Mitigation Status Forms and any other information presented by the Monitor as monitoring occurs.
- Oversee amendments of the MMRP, if changes in monitoring activities are deemed necessary, to provide equivalent mitigation measures and maintain conformance with goals of the plan.
- Coordinate with the Environmental Compliance Division as necessary.
- Ensure that the mitigation measures in the MMRP are undertaken, via staff, contractors, or consultants.
- Ensure that penalties to contractors for noncompliance and for ongoing noncompliance are incorporated into contracts.
- Verify monthly that mitigation actions are properly undertaken. This may include designation of a BART staff person or consultant to enforce effective and timely compliance with regard to specific mitigation measures outlined in this MMRP or required permits. Such staff or consultants referenced in this MMRP include Construction Management Oversight. Construction Management Oversight will be knowledgeable in regulatory compliance applicable to the project and will be responsible for day-to-day supervision of construction activities to ensure compliance with regulatory permits.
- Ensure that procedures and assignments to implement the MMRP are in place in the event that the BART structure is reorganized prior to completion of the MMRP actions.

## Step 3. Reporting

This step will be executed by the Monitor.

The Monitor will have the following responsibilities.

- Compile all Mitigation Status Forms into a Report of Compliance on a quarterly basis. Convey the status and any recommendations to the PM. Recommendations may include updating the frequency of monitoring, changing the type of monitoring, and suggesting better ways to implement mitigation.
- Assist the Project Manager in reviewing contractor's response to ENCRs, and preparing details of corrective action and time of completion to resolve issues raised. If the Monitor deems mitigation is satisfactorily completed, the noncompliance situation will expire. If Monitor deems mitigation to be unsatisfactorily addressed, Monitor will document the non-compliance in a report. The reports will be submitted to the BART Board of Directors by the Environmental Compliance Manager.
- Verify that the ENCR is enforced, that the contractor has taken corrective action and submitted a formal response to the ENCR, and the contractor will incur appropriate penalties as specified in the contracts. Monitor will report corrective actions taken to remedy noncompliance or ongoing noncompliance to the Environmental Compliance Manager who will report to the BART Board of Directors.
- Submit all completed reports and statements to the Environmental Compliance Manager for submittal to the BART Board of Directors.

## 1.6. General Mitigation and Monitoring Efforts

In general, BART staff will be responsible for implementing or ensuring that the mitigation actions listed in the MMRP are undertaken for this project. Implementation includes ensuring that any required actions are included in bid documents and contracts as part of the design and construction process for the project and ensuring that the consultants and contractors include specified mitigation activities in plans and specifications for construction. BART staff responsibility includes designation of certain mitigation responsibility to, and continued oversight of, the contractors and consultants.

The Monitor will investigate noncompliance allegations and identify how BART staff or its designees, contractors, or consultants should correct implementation of the measure. The recipient of the ENCR has 30 days to respond with plans for corrective action, unless another time frame is required by state or federal regulatory agencies or as specified in contracts. Otherwise, BART staff is responsible for enforcing contracts to bring ENCRs into conformance; contractors or consultants are responsible for correcting actions in nonconformance, as indicated in contracts. If a measure is under control of another agency, the Monitor will inform the agency of the monitor's determination and request improved implementation. All actions taken as part of this MMRP will be documented monthly and reported quarterly to the BART Board of Directors by the BART Environmental Compliance Manager.

This MMRP will be available for public review at the office of the BART Manager of Environmental Compliance, currently 300 Lakeside Drive, Oakland, California 94612. For the extent of the mitigation monitoring period, as listed in each mitigation measure, individuals and public agencies may notify the BART Manager of Environmental Compliance in writing if mitigation measures are not implemented or not being executed properly.

# Project Mitigation Measures

## 2.1 Introduction

This section describes the mitigation measures for each of the impacts identified in the environmental evaluations and identifies the parties responsible for implementation and monitoring of each measure. In most cases, most recent mitigation measures from the 2006 EIS have superseded similar mitigation measures from the earlier documents. This occurred because the newer mitigation measures are more specific, provide a greater level of detail, or may be more stringent than the earlier mitigation measures.

Mitigation measures are numbered using a prefix to link them with the impact they address (“Mitigation Measure HazMat-1” refers to the first mitigation measure in the “Hazards and Hazardous Materials” section). For ease of reference, the impacts and mitigation measures in this MMRP are numbered as they were described in the environmental analysis. Because not all of the impacts identified in the environmental analysis have mitigation measures associated with them, the numbers are not always sequential. For example, Mitigation Measure HazMat-1 is followed by Mitigation Measure HazMat-3, because no mitigation measures were identified for Impact HazMat-2. Cumulative impacts are identified as “cume” (for example, Mitigation Measure POP-Cume-2 “Coordinate access and traffic control during construction of cumulative projects”). The resource topics are discussed in the same order as in the 2006 EIS.

## 2.2 Mitigation Measures

### Transportation

#### Mitigation of Intersection Impacts

Impacts on intersections are based upon the modeling of traffic in 2010 and 2025 under different circumstances: (i) with and without the optional Irvington Station; and (ii) with and without the cumulative effects on traffic of the Project together with the Silicon Valley Rapid Transit Corridor (SVRTC) project, if that project is adopted.

Accordingly, the need for intersection improvements identified as mitigation measures will depend on the circumstances as indicated below.

**A. The following mitigation measures TRN-5 and TRN-6 will be implemented, whether or not the optional Irvington Station or the SVRTC project is constructed.**

**Impacts TRN-5, TRN-9, TRN-12, TRN-17, TRN-Cume2, and TRN-Cume4.** Changes in Velocity-to-Capacity (V/C) and Level of Service (LOS) at the intersection of I-680 southbound ramps/Durham Road/Auto Mall Parkway.

**Mitigation Measure TRN-5: Improve V/C and LOS at the intersection of I-680 southbound ramps/Durham Road/Auto Mall Parkway.** The intersection operations could be improved to a V/C ratio of 0.75 and LOS C in the a.m. peak hour and a V/C ratio of 0.89 and LOS D in the p.m. peak hour, with the conversion of an eastbound through lane to a shared right-turn/through lane (to create another right-turn lane). This measure could be accommodated within the existing right-of-way, although the southernmost eastbound through lane would need to be restriped to accommodate the measure. Although not achieving the goal of a V/C ratio of 0.85, the measure would result in LOS D operations, which reduce the impacts to a less-than-significant level.

#### **Monitoring:**

1. BART staff will coordinate with the City of Fremont to implement appropriate intersection modifications as described above. These improvements will be carried out with the cooperation and approval of the City of Fremont.
2. If the improvements are constructed by the city, BART staff will ensure and Monitor will verify that BART contributes its fair share of the actual cost of the improvements, based on the proportional share of BART-generated traffic volume as a percentage of the total traffic volume at the intersection.
3. If improvements are constructed by the contractor, BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications include the intersection modifications required to implement the mitigation measures.

4. Monitor will contact the City of Fremont and verify the status of improvements.
5. Monitor will verify in the field that the BART contractor is constructing the intersection modifications according to the construction plans.

**Impacts TRN-6, TRN-10, TRN-13, TRN-18, TRN-Cume-3, and TRN-Cume-5.** Changes in V/C and LOS at the intersection of Osgood Road/Warm Springs Boulevard/South Grimmer Boulevard.

**Mitigation Measure TRN-6: Improve V/C and LOS at the intersection of Osgood Road/Warm Springs Boulevard/South Grimmer Boulevard.** The intersection operations could be improved to an acceptable V/C ratio and LOS with the addition of a second northbound left-turn lane, a second eastbound left-turn lane, and an exclusive eastbound right-turn lane, and conversion of the northbound right-turn lane to a shared right-turn/through lane. The mitigation for the northbound approach could be accommodated within the existing right-of-way. With the conversion of the northbound right-turn lane to a shared right-turn/through lane, a second left-turn lane could be accommodated. The northbound approach would need to be restriped. To accommodate the mitigation for the eastbound approach, right-of-way would need to be acquired on the south side of Grimmer Boulevard. The west leg of the intersection would need to be restriped to accommodate the second eastbound left-turn lane and the exclusive eastbound right-turn lane.

**Monitoring:**

1. BART staff will coordinate with the City of Fremont to implement appropriate intersection modifications as described above. These improvements will be carried out with the cooperation and approval of the City of Fremont.
2. If the improvements are constructed by the city, BART staff will ensure and Monitor will verify that BART contributes its fair share of the actual cost of the improvements, based on the proportional share of BART-generated traffic volume as a percentage of the total traffic volume at the intersection.
3. If improvements are constructed by the contractor, BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications include the intersection modifications required to implement the mitigation measures.
4. Monitor will contact the City of Fremont and verify the status of improvements.
5. Monitor will verify in the field that the BART contractor is constructing the intersection modifications according to the construction plans.

**B. If the optional Irvington Station is constructed, the following additional mitigation measure TRN-15 will be implemented, whether or not the SVRTC project is constructed.**

**Impacts TRN-15 and TRN-Cume-7. Change in V/C and LOS at the intersection of Osgood Road/Driscoll Road/Washington Boulevard.**

**Mitigation Measure TRN-15: Improve V/C and LOS at the intersection of Osgood Road/Driscoll Road/Washington Boulevard.** The intersection operations could be improved to

an acceptable V/C ration and LOS with the conversion of the second southbound left lane to a third through lane, conversion of the southbound right-turn lane to a shared through/right-turn lane (to create four southbound through lanes), and conversion of a westbound left-turn lane to a shared left-turn/through lane (creating two westbound left turn lanes). The proposed changes to the southbound and westbound approaches could be accommodated within the existing right-of-way, although the approaches would need to be restriped. This measure would require widening the west side of Osgood Road along the BART frontage to accommodate four southbound receiving lanes.

### **Monitoring:**

1. BART staff will coordinate with the City of Fremont to implement appropriate intersection modifications as described above. These improvements will be carried out with the cooperation and approval of the City of Fremont.
2. If the improvements are constructed by the city, BART staff will ensure and Monitor will verify that BART contributes its fair share of the actual cost of the improvements, based on the proportional share of BART-generated traffic volume as a percentage of the total traffic volume at the intersection.
3. If improvements are constructed by the contractor, BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications include the intersection modifications required to implement the mitigation measures.
4. Monitor will contact the City of Fremont and verify the status of improvements.
5. Monitor will verify in the field that the BART contractor is constructing the intersection modifications according to the construction plans.

## **Mitigation of Parking Impacts**

Impacts on parking are based upon the modeling of traffic in 2010 and 2025 under different circumstances: (i) with and without the optional Irvington Station; and (ii) with and without the cumulative effects on traffic of the Project together with the Silicon Valley Rapid Transit Corridor (SVRTC) project, if that project is adopted.

Accordingly, the need for additional parking identified in mitigation measures will depend on the circumstances as indicated below. In addition, although spillover parking is not expected to be significant, a parking monitoring program has been included to ensure that parking activity is monitored and that additional mitigation will be undertaken if a significant parking spillover impact is identified.

### **A. If neither the optional Irvington Station nor the SVRTC project has commenced construction by 2010, the following mitigation measure will be implemented.**

**Impacts TRN-23. Reduced parking supply at the Fremont station resulting in spillover into residential or commercial areas.**



**Mitigation Measure TRN-23: Provide additional parking at the Warm Springs Station and implement parking monitoring program at the Fremont and Warm Springs Stations.**

1. If neither the Irvington Station nor SVRTC has commenced construction by 2010, BART will provide an additional 170 parking spaces at the Warm Springs Station.
2. To determine whether substantial spillover parking occurs, BART will institute a monitoring program on streets adjacent to the Fremont and Warm Springs Stations. A baseline survey of parking conditions in the vicinity of the stations will be conducted prior to commencement of the Project. The baseline survey will establish parking conditions in the vicinity of the station during weekday morning hours. Monitoring will be conducted during the first six months of operation of the Project to verify if spillover parking is occurring. Such monitoring will be based on field surveys and any complaints received by BART and local parking authorities. After the first six months of operation of the station, BART Community Relations staff will respond to parking complaints and BART will investigate such complaints to verify parking concerns.
3. If a parking spillover problem is confirmed by this monitoring, BART staff will assist the City of Fremont in implementing a parking management program. The program will incorporate appropriate parking control measures based on BART's Parking Management Toolkit (See Appendix N). The Toolkit identifies a detailed process for understanding local parking issues, evaluating parking conflicts, and implementing specific parking control measures. These measures could include time limits and time-based restrictions, increased enforcement, or parking fees. The parking management program would be implemented by the City of Fremont. BART staff will assist the city to ensure that the parking control measures, adapted as appropriate for site-specific conditions, are implemented and are achieving the necessary effect. BART staff would also continue discussions as necessary with the city to help adjust any parking control measures in response to issues that may arise during implementation of such measures.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications, include requirements to provide additional parking spaces as described above.
2. BART staff will ensure and Monitor will verify that a baseline survey of parking conditions and monitoring during the first six months of operation of the Project are conducted on streets in the vicinity of the Fremont and Warm Springs Stations as described above. BART staff or a consultant will perform the survey and monitoring.
3. If spillover parking is identified as a problem, BART staff will ensure and Monitor will verify that the Parking Management Toolkit is made available to the City of Fremont and will provide assistance in implementation of the site-specific measures.
4. Monitor will verify coordination with the City of Fremont.

**B. If the optional Irvington Station is constructed by 2010, the following mitigation measure TRN-24 and TRN-Cume-9 will be implemented, whether or not the SVRTC project is constructed.**

**Impacts TRN-24 and TRN-Cume-9. Reduced parking supply at the Fremont and Irvington Stations resulting in spillover into residential or commercial areas.**

**Mitigation Measures TRN-24 and TRN-Cume-9: Implement parking monitoring program at the Fremont and Irvington Stations.** If the optional Irvington Station is constructed, to determine whether substantial spillover parking occurs, BART will institute a monitoring program on streets adjacent to the Fremont and Irvington Stations and, if necessary, provide parking management assistance as described above in Mitigation Measure TRN-23, part (B).

**Monitoring:**

1. BART staff will ensure and Monitor will verify that a baseline survey of parking conditions and monitoring during the first six months of operation of the Project are conducted on streets in the vicinity of the Fremont and Irvington Stations as described under Mitigation Measure TRN23, part (B). BART staff or a consultant will perform the survey and monitoring.
2. If spillover parking is identified as a problem, BART staff will ensure and Monitor will verify that the Parking Management Toolkit is made available to the City of Fremont and will provide assistance in implementation of the site-specific measures.
3. Monitor will verify coordination with the City of Fremont.

**C. If the SVRTC project has commenced construction by 2010 but the Irvington Station has not, the following mitigation measure TRN-Cume-8 will be implemented.**

**Impacts TRN-Cume-8. Cumulative contribution to reduced parking supply at the Fremont station resulting in spillover into residential or commercial areas.**

**Mitigation Measure TRN-Cume-8 – Provide additional parking and implement parking monitoring program at the Fremont Station.**

1. If SVRTC has commenced construction by 2010 but the Irvington Station has not, BART will provide an additional 120 parking spaces at the Warm Springs Station.
2. To determine whether substantial spillover parking occurs, BART will institute a monitoring program on streets adjacent to the Fremont Station and, if necessary, will provide parking management assistance, as above described in Mitigation Measure TRN23, part (B).

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications, include requirements to provide additional parking spaces as described above.

2. BART staff will ensure and Monitor will verify that a baseline survey of parking conditions and monitoring during the first six months of operation of the Project are conducted on streets in the vicinity of the Fremont Station as described under Mitigation Measure TRN-23, part (B). BART staff or a consultant will perform the survey and monitoring.
3. If spillover parking is identified as a problem, BART staff will ensure and Monitor will verify that the Parking Management Toolkit is made available to the City of Fremont and will provide assistance in implementation of the site-specific measures.
4. Monitor will verify coordination with the City of Fremont.

### **Impact TRN-25—Construction-period traffic impacts.**

#### **Mitigation Measure TRN-25: Develop and implement a construction phasing and traffic management plan.**

1. BART will prepare and implement a construction phasing and traffic management plan that defines how traffic operations (including construction equipment and worker traffic) are managed and maintained during each phase of construction. The plan will be developed in consultation with the City of Fremont, Caltrans, AC Transit, and Santa Clara Valley Transportation Authority (VTA), and will be coordinated with the plan to maintain access and parking for businesses and residences described in Mitigation Measure POP7. To the maximum practical extent, the plan will include the following measures.
  - a) Plan, schedule, and coordinate construction activities to reduce effects on AC Transit and VTA bus lines, so that additional buses or larger buses are not required on any route to maintain on-time performance.
  - b) Specify predetermined haul routes from staging areas to construction sites and disposal areas by agreement with the City of Fremont prior to construction. The routes will follow streets and highways that provide the safest route and have the least feasible impact on traffic.
  - c) Identify construction activities that, due to concerns regarding traffic safety or congestion, must take place during off-peak traffic hours. Any road closures will be done at night under ordinary circumstances. If unforeseen circumstances require road closure during the day, the City of Fremont will be consulted.
  - d) Provide a detour plan for lane closures and for the diversions of Walnut Avenue, Stevenson Boulevard, and South Grimmer Boulevard, and require information be provided to the public on lane closures and detours using signs, press releases, and other media tools.
  - e) Identify a telephone number that the public can call for information on construction scheduling, phasing, and duration, as well as for complaints. Such information will also be posted on BART's website.
  - f) Provide safe access and circulation routes for vehicles, bicycles, and pedestrians during construction at the Fremont BART Station.

- g) Provide parking replacement where construction results in temporary displacement of parking in Fremont Central Park.
  - h) Coordinate, to the extent feasible, with the city's grade separations project to reduce traffic disruption.
2. To reduce to the greatest extent possible the total duration of construction where the BART alignment crosses Paseo Padre Parkway and the corresponding potential for traffic disruption, elements of the BART bridge structure should be constructed at the same time as the city's grade separations project.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications include requirement that the contractor develop and implement a construction phasing and traffic management plan, as described above.
2. BART staff will ensure coordination with the City of Fremont to develop and implement the construction phasing and traffic management plan.
3. BART staff will ensure consultation with the City of Fremont to coordinate with the grade separation project.
4. Monitor will verify implementation in the field.

**Impact TRN-Cume-10—Cumulative contribution to construction-related impacts.**

**Mitigation Measure TRN-Cume-10 – Adjust the construction traffic management plan described above in Mitigation Measure TRN25.** If construction of the Proposed Project and SVRTC overlap, the construction traffic management plan identified in Mitigation Measure TRN25 will be adjusted to account for the SVRTC construction schedule. BART will ensure that the plan as adjusted satisfies the goals identified in Mitigation Measure TRN25.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications, include requirements to adjust the construction traffic management plan, as described above.
2. BART staff will ensure coordination with the City of Fremont.

## Geology, Soils, and Seismicity

### Impact G-1—Potential impacts resulting from earthquake-induced ground shaking and ground rupture.

**Mitigation Measure G-1—Conduct geotechnical surveys to accurately locate the primary and secondary traces of the Hayward fault zone (HFZ).** BART will conduct geotechnical and geological surveys to accurately locate the primary and secondary traces of the Hayward fault relative to the WSX Alternative alignment.

**Mitigation Measure G-2—Design and construct BART tracks on engineered embankments.** In general, engineered earthen embankments are more tolerant of the differential fault movement than are rigid structures that could otherwise be used to support elevated BART tracks. Accordingly, segments of the proposed BART tracks that cross known traces of the HFZ will be constructed on engineered earthen embankments instead of rigid structures. The embankment design will be prepared in accordance with the BART Extensions Program Design Criteria, Volume II, 1990, and specific recommendations developed for the fault crossing near Walnut Avenue (Bay Area Transit Consultants 1989).<sup>1</sup> The design criteria established for the Walnut Avenue crossing will include adequate crest width to accommodate track realignment that could become necessary due to fault rupture and/or fault creep, 2:1 side slopes, and removal of unstable foundation materials.

**Mitigation Measure G-3—Design and construct proposed alignment excavations to accommodate future track repair and realignment.** Where the WSX Alternative alignment crosses the fault approximately 300 feet north of Washington Boulevard, it would be located within an excavation approximately 4 to 6 feet below the existing ground surface. The excavation will be designed and constructed with sufficient width to accommodate track repair and realignment that would be necessary if the tracks were deformed by fault rupture and/or fault creep. The embankments of the excavation will be constructed in accordance with BART seismic design criteria. These design criteria will minimize damage and facilitate repair in the event of seismic shaking.

**Mitigation Measure G-4—Implement redundant emergency response measures from the BART Emergency Plan.** In the event of an earthquake, BART will implement redundant emergency response measures of the BART Emergency Plan to reduce the potential for train derailment following an earthquake. Strong motion sensors currently in use throughout the BART system are proposed for each passenger station included as part of the WSX Alternative. In the event of an earthquake, the strong motion sensors would trigger an emergency operation procedure, which would require that all trains proceed in manual operation at a maximum speed of 25 miles per hour to the nearest station. The trains would be held at the stations until the tracks and structures throughout the area affected by the earthquake have been inspected by the BART engineering staff and subcontractors. If fault rupture or seismically induced ground

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<sup>1</sup> These criteria have subsequently been superseded by the BART Facilities Standards, which were adopted August 2004.

failures result in the deformation of the tracks, power to trains in the affected area would be automatically cut off, further reducing the potential for derailment.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that geotechnical surveys are conducted and accurately locate fault races.
2. BART staff will ensure and Monitor will verify that engineered earthen embankments are used to cross the Hayward fault near Walnut Avenue and that design is consistent with BART Facilities Standards.
3. BART staff will ensure and Monitor will verify that the fault crossing north of Washington Boulevard is designed consistent with BART Design Criteria and is of sufficient width to allow for fault creep.
4. BART staff will ensure and Monitor will verify that the BART's Emergency Response Plan has been incorporated into the WSX operating plan.

**Impact G-2—Potential impacts resulting from fault creep within the Hayward fault zone.**

**Mitigation Measure G-5—Perform periodic track and structure inspection, track alignment surveys, and reports of adverse track conditions by train operators.**

1. BART will implement a track maintenance program during operation of the WSX Alternative. The track maintenance program includes periodic inspection of tracks and associated structures, track alignment surveys, and reports of adverse track conditions by train operators.
2. Track inspections are currently conducted throughout the BART system on a weekly basis by a professional maintenance staff. Track alignment surveys will be conducted semiannually by BART survey crews to determine when track alignment displacements are approaching tolerance levels established by BART. Measurement of track displacements will also be performed monthly by a specially designed laser geometry car currently used by BART to monitor track conditions at the Berkeley Hills tunnel, the location of an existing track that crosses the HFZ. All monitoring of track displacements will be documented and compiled in a file maintained by BART surveying staff. In addition to regular track alignment inspection, reports by BART train operators will be used to identify track conditions that could adversely affect train performance.
3. To reduce the potential for train derailments, damaged and deformed tracks will be repaired and/or realigned when unacceptable amounts of deformation are detected.

**Mitigation Measure G-6—Design proposed structures to accommodate fault creep.**

Proposed structures placed directly across known traces of the HFZ (e.g., Tule Pond) will be constructed on extra-wide, mechanically stabilized earth embankments designed to accommodate incremental displacements resulting from fault creep. Additionally, specially designed splice boxes will be placed on both sides of fault to provide flexibility for power and communications cables, which will minimize damage from fault creep.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that a program is prepared and implemented to verify that BART's track alignment inspections and surveys are conducted and expanded to include the Warm Springs Extension.
2. Monitor will verify that documentation of all monitoring of track alignment inspections and surveys has been completed.
3. BART staff will ensure and Monitor will verify that all structures crossing known fault traces are on mechanically stabilized embankments and designed to accommodate fault creep.

**Impact G-3 – Potential impacts resulting from expansive soils.**

**Mitigation Measure G-7—Design proposed structures to account for potential soil expansion.** Standard engineering practices will be implemented where necessary to minimize the potential for damage from expansive soils. The specific practices used will be selected during the final design stages of the WSX Alternative, but may involve the treatment of expansive soils with lime to reduce expansion potential, the installation of structures that can withstand pressures generated by expansive soils, and/or the replacement of expansive soils with non-expansive fill material.

**Monitoring:**

BART staff will ensure and Monitor will verify that structural design features, lime injection, or non-expansive fill have been included in design specifications for areas where expansive soils are found to exist.

**Impact G-4—Potential impacts resulting from soil compression.**

**Mitigation Measure G-8—Implement appropriate design criteria to minimize the potential for detrimental soil compression and ground settlement.**

1. The proposed embankment near Walnut Avenue will be designed and constructed in accordance with the requirements of the BART Extension Program Design Criteria<sup>2</sup> and the California Building Standards Code (CBSC) (Title 24, CCR). Organic soils and organic-rich sediments located in the area will be excavated and removed from the action area prior to

<sup>2</sup> These criteria have subsequently been superseded by the BART Facilities Standards, which were adopted August 2004.

construction. Under no circumstances will organic soils and organic-rich sediments be used as fill material.

2. BART may also choose to implement other engineering practices designed to reduce the potential for soil compression and settlement. The specific practices used will be selected during the final design stages of the WSX Alternative, but may involve the installation of wick drains and/or cement deep soil mixing or surcharge.

**Mitigation Measure G-9—Monitor ground settlement during operation of the WSX Alternative.** BART surveying staff will monitor settlement and track alignment along the proposed embankment south of Walnut Avenue during operation of the proposed action.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that treatment or replacement of compressible soils has been included in design specifications and implemented in the field.
2. BART staff will ensure and Monitor will verify that ground settlement and track alignment is monitored.

**Impact G-5—Potential impacts on paleontological resources as a result of WSX construction activities.**

**Mitigation Measure G-10—Identify Pleistocene units before construction.** BART will work with the project engineering design and geotechnical contractors to ensure that sites or areas where construction could impact Pleistocene units are identified before construction begins.

**Mitigation Measure G-11— Provide paleontological monitoring for construction activities with potential to disturb Pleistocene units.**

1. Once construction begins, the paleontological monitor will be on site during all ground-disturbing activities in areas in which potential impacts to units of known or potential Pleistocene-age material in the surface or subsurface material could occur. BART will retain a qualified professional paleontologist<sup>3</sup> to provide monitoring services during ground-disturbing site preparation and construction activities including, but not necessarily limited to, vegetation clearing, excavation, and drilling. Where Pleistocene materials are exposed at the ground surface, the paleontological monitor will conduct preliminary survey and, if significant paleontological materials are found, surface salvage before site preparation and construction begin. The goal of salvage operations will be to ensure that any paleontological materials exposed at the surface are recovered and properly prepared and curated, or protected from damage using exclusion fencing or other appropriate means. Any exclusion fencing or other protective measures will be designed by the paleontological monitor in consultation with BART, to ensure that it adequately protects significant resources without

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<sup>3</sup> The qualified professional paleontologist would meet all standards as required by the Society of Vertebrate Paleontology (Society of Vertebrate Paleontology Conformable Impact Mitigation Guidelines Committee 1995).



unnecessarily impeding construction activities. Once construction begins, the paleontological monitor will be on site during all ground-disturbing activities in specified areas.

2. Specific areas where paleontological monitoring will be required include, but are not limited to, the northern section of the WSX alignment from approximately 250 feet (76 meters) north of Stevenson Boulevard to the northern ventilation structure (CPS) approximately 1,200 feet (366 meters) south of Stevenson Boulevard for the subway section; and the southern section of the alignment from 300 feet south of Paseo Padre Parkway to Blacow Road for the at-grade portion of the alignment, and the area near the southern terminus. In addition, cutting recovery will be monitored at sites where piers, pilings, or other features require drilling into units of known or potential Pleistocene age.

**Mitigation Measure G-12—Stop work if vertebrate fossils are encountered during site preparation or construction.** If vertebrate fossils are discovered during construction of the BART WSX alignment, including but not limited to sites with potential Pleistocene disturbance identified in Mitigation Measure G-11 above, all ground-disturbing work on the site will stop immediately until a qualified professional paleontologist can assess the nature and importance of the find and recommend appropriate treatment. Treatment will be consistent with SVP guidelines (Society of Vertebrate Paleontology Conformable Impact Mitigation Guidelines Committee 1995), and may include preparation and recovery of fossil materials so that they can be housed in an appropriate museum or university collection. BART will ensure that information on the nature, location, and depth of all finds is readily available to the scientific community. BART will ensure that all professional construction staff receive briefings on recognition of fossil materials to ensure that the stop work directive is appropriately implemented on sites where monitoring is not required.

**Monitoring:**

1. Prior to construction, BART staff will ensure and Monitor will verify that potential Pleistocene units have been identified.
2. BART staff will ensure and Monitor will verify that a qualified paleontologist is selected as construction field monitor. Monitor will ensure that paleontological monitor had access to all construction areas.
3. BART staff will ensure and Monitor will verify that if vertebrate fossils are found that work in the immediate vicinity of the find will stop until the resources can be assessed.
4. BART staff will ensure and Monitor will verify treatment of paleontological resources are assessed properly and treated consistent with SVP guidelines.
5. BART staff will ensure and Monitor will verify that the information on any paleontological finds is readily accessible to the scientific community.

**Impact G-6—Potential impacts on optional Irvington Station resulting from earthquake-induced ground shaking and ground rupture.**

**Mitigation Measure G-1—Conduct geotechnical surveys to accurately locate the primary and secondary traces of the HFZ.** This mitigation measure is described above.

**Mitigation Measure G-4—Implement redundant emergency response measures from the BART Emergency Plan.** This mitigation measure is described above.

**Mitigation Measure G-7—Design proposed structures to account for potential soil expansion.** This mitigation measure is described above.

**Mitigation Measure G-13—Locate Irvington Station structures outside the zone of potential fault rupture.** Structures at the proposed Irvington Station that would be occupied by workers or passengers will be located outside the zone of potential fault rupture. The typical recommended minimum setback from an identified fault is 50 feet and 100 feet from an inferred or suspected fault trace (Blair and Spangle 1979).

**Mitigation Measure G-14—Design and construct all Irvington Station structures in accordance with applicable building standards.** BART will design and construct all proposed structures at Irvington Station in accordance with the BART Extension Program Design Criteria and applicable standards from the CBSC in cooperation with the City of Fremont.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that any occupied structures at the Irvington Station will be located outside the potential fault rupture zone.
2. BART staff will ensure and Monitor will verify that design of the Irvington Station, in cooperation with the City of Fremont, meets all applicable standards.

**Impact G-7—Potential impacts on paleontological resources during construction of the optional Irvington Station.**

**Mitigation Measure G-10—Identify Pleistocene units before construction.** This measure is described above.

**Mitigation Measure G-11—Provide paleontological monitoring for construction activities with potential to disturb Pleistocene units.** This measure is described above.

**Mitigation Measure G-12—Stop work if vertebrate fossils are encountered during site preparation or construction.** This measure is described above.

**Monitoring:**

1. Prior to construction, BART staff will ensure and Monitor will verify that potential Pleistocene units have been identified.

2. BART staff will ensure and Monitor will verify that a qualified paleontologist is selected as construction field monitor. Monitor will ensure that paleontological monitor had access to all construction areas.
3. BART staff will ensure and Monitor will verify that if vertebrate fossils are found that work in the immediate vicinity of the find will stop until the resources can be assessed.
4. BART staff will ensure and Monitor will verify treatment of paleontological resources are assessed properly and treated consistent with SVP guidelines.
5. BART staff will ensure and Monitor will verify that the information on any paleontological finds is readily accessible to the scientific community.

**Impact G-8—Potential slope instability in excavations and during construction.**

**Mitigation Measure G-15—Design and construct deep excavations according to applicable building codes.** All excavations will be designed and constructed in accordance with applicable design criteria and standards from the CBSC, the BART Extension Program,<sup>4</sup> and the shoring requirements of the California Occupational Safety and Health Administration.

**Monitoring:**

BART staff will ensure and Monitor will verify that all excavations are conducted in accordance with applicable building codes.

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<sup>4</sup> These criteria have subsequently been superseded by the BART Facilities Standards, which were adopted August 2004.

## Hazards and Hazardous Materials

### **Impact HazMat-1—Creation of a hazard to the public or the environment from reasonably foreseeable accidents involving the release of hazardous materials.**

**Mitigation Measure HazMat-1—Implementation of BART Emergency Plan.** Procedures for responding to potential hazards associated with discovery of hazardous materials releases from the pipelines or adjacent railcars traveling on the SP and UP tracks are described in BART's Emergency Plan. The BART System Safety Department is responsible for implementation of BART's Emergency Plan, the authoritative procedure to be used in an emergency event. The plan establishes standard policies and procedures for the mobilization of BART and other public safety resources so that fast, controlled, and predictable responses can be made to various types of emergencies. Specific response procedures for a full range of foreseeable types of emergencies are addressed in the plan and include response procedures for gas leaks and toxic spills. In all cases, the Emergency Plan identifies the responsibilities of the involved persons and authorities (train operators, BART Central Control, BART police, the responding fire departments, etc.) and sets forth an operations plan for each type of emergency. The various operations plans address the initial fact-finding and reporting procedures, communication requirements, evacuation and rescue procedures, emergency scene boundaries and restrictions, public information, and related factors.

#### **Monitoring:**

BART staff will ensure and Monitor will verify that the hazardous materials accident provisions in the Emergency Response Plan and in the site health and safety plan have been expanded to include the Warm Springs Extension prior to the completion of final design.

### **Impact HazMat-3—Exposure of workers or the public to hazardous materials in the soil or groundwater resulting in adverse health effects.**

**Mitigation Measure HazMat-3—Conduct additional site characterization; prepare and implement site-specific health and safety plan; develop and implement a soil/groundwater management plan.**

1. BART will retain the services of a registered geologist or professional engineer to develop and implement a work plan for additional site characterization along portions of the WSX Alternative alignment where grading, excavation, or dewatering is likely to occur.
2. Construction activity in contaminated areas, including excavation and grading, will be conducted with a site-specific health and safety plan prepared by a qualified professional. The plan will provide safety guidelines, delineation of action levels for personal protective gear, and emergency response procedures. The plan would be reviewed by all construction workers prior to commencement of construction.

3. To mitigate impacts associated with exposure to hazardous materials during construction, BART will develop and implement a soil/groundwater management plan for approval by the appropriate regulatory agencies. Contaminated solids or groundwater excavated or extracted during construction activities would be managed in accordance with the approved soil management plan and regulatory agency oversight. Remediation of soils could include excavation and on- or off-site treatment/disposal or in-place treatment of the affected soils. Remediation of groundwater could include in-situ treatment or extraction and treatment. Disposal options for contaminated soil and groundwater (i.e., on- or off-site treatment and/or disposal) would depend on the specific chemicals present and the levels of contamination. The following steps are included in such a process.
  - a) Develop a work plan for additional site characterization.
  - b) Undertake additional soil sampling in areas of known contamination to further define the horizontal and vertical extent of contamination.
  - c) Conduct groundwater testing in locations where dewatering activities may be required to identify any potential groundwater contamination for water management purposes.
  - d) Develop and obtain approval of a soil management plan to address proper handling of contaminated materials.
  - e) Handle contaminated soils in accordance with the approved soil management plan.
  - f) Construction work with contaminated soils will utilize dust control measures and sediment and erosion control measures (Mitigation Measure H-9) to prevent exposure to workers, the public, and the environment. Where appropriate, air monitoring will be conducted to measure the effectiveness of the control measures.
  - g) Manage groundwater discharges in accordance with construction stormwater, pre-treatment, or National Pollutant Discharge Elimination System (NPDES) permits as appropriate.
  - h) Document the remediation work for submittal to the local and state agencies overseeing implementation of the soil management plan.
4. If any unidentified contaminated materials are encountered during construction or an accident results in the release of hazardous materials, halt work to ascertain the immediacy and nature of the material. If necessary, clear the area to provide safety to workers and the public. Take measures to isolate the release and determine a course of action for cleanup, treatment, and/or disposal of contaminated materials. Notify public emergency services and regulatory agencies as appropriate. Prior to construction near the underground fuel pipelines, the exact location of lines should be accurately established (e.g., accurate maps from the owner or operator or geophysical surveys). Potential hazards associated with rupture of the pipelines or discovery of hazardous materials releases from the pipelines should be included in the site health and safety plan.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that BART retains a Registered Geologist or Professional Engineer to develop a Work Plan for additional sites along portions of the Project alignment where grading, excavation, or dewatering is likely to occur.
2. BART staff to ensure and Monitor to verify that construction activity in contaminated areas is conducted with a site-specific health and safety plan prepared by a qualified professional. Monitor to verify that the plan is reviewed by all construction workers prior to commencement of construction. BART staff will ensure and Monitor to verify that a soil management plan is developed for approval by appropriate regulatory agencies.
3. Monitor will verify that an approved soil management plan is implemented.

**Impact HazMat-4—Potential handling of hazardous materials within 0.25 mile of an existing school.**

**Mitigation Measure HazMat-3—Conduct additional site characterization; prepare and implement site-specific health and safety plan; develop and implement a soil/groundwater management plan.** This mitigation measure is described above.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that BART retains a Registered Geologist or Professional Engineer to develop a Work Plan for additional sites along portions of the Project alignment where grading, excavation, or dewatering is likely to occur.
2. BART staff to ensure and Monitor to verify that construction activity in contaminated areas is conducted with a site-specific health and safety plan prepared by a qualified professional. Monitor to verify that the plan is reviewed by all construction workers prior to commencement of construction. BART staff will ensure and Monitor to verify that a soil management plan is developed for approval by appropriate regulatory agencies.
3. Monitor will verify that an approved soil management plan is implemented.

**Impact HazMat-5—Potential for demolition or renovation of existing structures to expose workers to lead-based paint and asbestos-containing materials.**

**Mitigation Measure HazMat-5—Survey and properly handle materials from structures that may contain asbestos and lead-based paint.** Prior to demolition or renovation of structures built before 1978, a survey for the presence of asbestos-containing material (ACM) will be conducted. The survey will be conducted by Asbestos Hazard Emergency Response Act (AHERA)-certified personnel, trained according to state and federal regulations. Structures will also be surveyed for the presence of lead-based paint. If the results of the survey detect the presence of lead-based paint, construction will be performed in accordance with the Lead in Construction Standard (8 Cal. Code of Regulations Section 5132.1). ACM will be removed in

accordance with the requirements of the California Occupational Safety and Health Administration (Cal OSHA) (8 Cal. Code of Regulations 5129) and the Bay Area Air Quality Management District (BAAQMD).

**Monitoring:**

1. BART staff to ensure and Monitor to verify that, prior to demolition or renovation, structures are surveyed for the presence of ACM and lead-based paint, as appropriate.
2. If ACM or lead-based paint is detected, BART staff will ensure and Monitor will verify that construction is performed and ACM is removed in accordance with the standards described above.

**Impact HazMat-6—Potential for interruption or delay of ongoing site investigation/ remediation activities.**

**Mitigation Measure HazMat-6—Cooperation and coordination with responsible site investigation/remediation parties and agencies.** BART will cooperate with ongoing investigation and cleanup efforts to the extent possible. BART will provide access as necessary to BART property for collection of soil samples, installation and monitoring of groundwater wells, or management of contaminated soils or groundwater. Persons conducting investigation/remediation activities would be required to comply with all regulatory requirements and BART safety and emergency programs.

**Monitoring:**

BART staff will consult and Monitor will verify consultation with local jurisdictions to determine if site investigation/remediation activities will occur during construction and, if so, coordinate with the Project Manager to ensure that clean-up agencies have appropriate access to the site.

## Hydrology and Water Quality

### **Impact H-1—Alteration of flooding conditions due to changes in infiltration rates, drainage patterns, or the rate and amount of surface runoff.**

**Mitigation Measure H-1—Design and implement a stormwater management system to safely convey stormwater.** BART will design and implement a stormwater management system and will develop and put into operation a stormwater management plan to convey flows up to and including the 100-year storm. The stormwater management system will be incorporated into plans and specifications for the WSX Alternative, and BART will submit the WSX Alternative designs to Alameda County Flood Control District (ACFCD) for approval to ensure that the WSX Alternative does not exacerbate either upstream or downstream flooding conditions. Drainage systems must be designed in compliance with guidelines published by ACFCD. In addition, any work that would encroach on structures or areas owned or operated by ACFCD would require approval from ACFCD. The stormwater management plan may recommend use of stormwater detention facilities to temporarily store the increased flows from storms up to and including the 15-year storm, and to discharge the flows at approximately predevelopment levels. BART will consult with ACFCD, Regional Water Quality Control Board (RWQCB), and the City of Fremont, as appropriate, to ensure that the WSX Alternative does not exacerbate either upstream or downstream flooding.

#### **Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require the contractor implement a stormwater management system for a 100-year design storm.
2. BART staff will ensure and Monitor will verify that BART submits the Project designs to ACFCD for approval to ensure that the Project does not exacerbate either upstream or downstream flooding conditions.
3. Monitor to verify in the field that the stormwater management plan is implemented.

### **Impact H-3—Loss of flood storage capacity at Tule Pond South.**

**Mitigation Measure H-3—Mitigate the loss of flood storage capacity by providing an equal or greater amount of storage capacity at the same location.** To maintain existing flood storage capacity, BART will expand Tule Pond South and/or create an additional flood storage facility (e.g., detention pond) at the same location. The storage capacity will be at least as large as the loss of storage resulting from installation of the WSX Alternative.

#### **Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other



plans and specifications incorporate elements of the flood storage facility will be implemented.

2. Monitor will verify in the field that flood storage capacity is provided.

#### **Impact H-4—Delivery of increased pollutant loads to urban drainages from expanded impervious areas.**

##### **Mitigation Measure H-4—Incorporate design features and implement best management practices (BMPs) for post-construction water quality protection.**

1. BART will incorporate design features for post-construction water quality protection into the stormwater management system described in Mitigation Measure H-1 above, and will ensure that appropriate water quality protection BMPs are used during operation of the WSX Alternative. Design features may include, but will not necessarily be limited to, water quality inlets, grassy swales, oil-water separators, and wet ponds. These structures remove hydrocarbons, dissolved pollutants, and particulate matter using a range of mechanisms, including particulate settling, biological uptake, flocculation, and filtration. BART will monitor and maintain water quality design features as necessary for the life of the WSX Alternative.
2. In addition to physical structures, BMPs may include programs designed to educate staff and reduce potential impacts on water quality. Likewise, BART may incorporate operational elements that will reduce or eliminate potential sources of point- and nonpoint source pollutants. In addition, BART may receive assistance in defining those BMPs and putting them into practice via the Clean Water Program's stormwater quality management plan.
3. For stormwater discharges associated with the maintenance facility, BART will file a Notice of Intent for coverage under the State Water Resources Control Board's General Permit for Discharges Associated with Industrial Activity. As required by the General Permit, BART will prepare a Storm Water Pollution Prevention Plan (SWPPP) for the maintenance facility and will implement BMPs as provided in the SWPPP.

##### **Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications incorporate all conditions for operational BMPs for the project.
2. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications include requirements that the contractor follow BMPs for postconstruction water quality protection and BMPs are specified in the SWPPP regarding prevention of pollutant discharges.
3. Monitor will verify implementation of a long-term program to implement BMPs specified in the SWPPP and to monitor and maintain water quality design features as necessary for the life of the Project.
4. BART staff will ensure and Monitor will verify that coverage under the NPDES general permit for stormwater associated with industrial activities is obtained prior to operation.

**Impact H-8—Water quality degradation from operational dewatering.****Mitigation measure H-8—Obtain NPDES permit and implement permit conditions for all operational dewatering activities that discharge to surface waters.**

1. If the subway seepage water is discharged to Mission Creek, Lake Elizabeth, a new wetland area, or used for groundwater recharge, BART will confer with the RWQCB to determine whether an NPDES permit or Waste Discharge Requirements (WDRs) are required for the discharge. If so, BART will obtain and comply with the conditions of the NPDES permit or WDRs. If the RWQCB determines that an NPDES permit or WDRs are not required, but directs BART to undertake other actions (such as a monitoring program) to ensure that the receiving waters or wetlands are not adversely affected by the discharge, BART will comply with the RWQCB direction.
2. If the subway seepage discharge is used for irrigation water, prior to utilizing the water for this purpose, BART and the City of Fremont will test the water for various pollutants of concern in order to determine that none exist at concentrations above acceptable standards for this application. (California Code of Regulations Title 22 guidelines for the unrestricted use of recycled water would be used as the standard.)
3. Although not considered necessary at this time, if the subway seepage is pumped to a sanitary sewer, BART will coordinate this activity with the Union Sanitary District.
4. If a groundwater recharge method is selected, BART may be required to obtain permits from Alameda County Water District (ACWD) and the US Environmental Protection Agency (USEPA). In that event, as part of the permitting process, BART would provide any necessary documentation of water quality to ensure adequate protection of beneficial uses.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that BART confers with RWQCB regarding whether a NPDES or WDR is required. If necessary, Monitor will confirm that conditions of NPDES or WDR are followed. If NPDES or WDR are not required, BART staff will ensure and Monitor will verify that receiving waters are not adversely affected.
2. If subway seepage is used for irrigation water, BART staff will ensure and Monitor will verify discharge water is tested and does not contain pollutants above acceptable standards.
3. If subway seepage is pumped to the Union Sanitary District (USD), Monitor will verify that BART staff coordinates this activity with USD.
4. If groundwater recharge is selected, BART staff will ensure and Monitor will verify that proper permits are obtained and documentation of water quality is provided.

**Impact H-9—Potential for accelerated erosion and discharge of sediment into water bodies as a result of ground-disturbing activities.****Mitigation Measure H-9—Ensure implementation of stormwater general NPDES permit conditions.**

1. As required by the NPDES General Permit for Discharges of Storm Water Associated with Construction Activities, BART will ensure that specific erosion and sediment control measures are utilized during WSX Alternative construction to prevent accelerated erosion stemming from grading and other ground-disturbing activities. Measures include, but are not limited to, the following.
  - a) Erosion Control Measures:
    - Temporary and permanent seeding of disturbed areas and stockpiles.
    - Use of erosion control blankets.
    - Stabilization of construction area entrances and exits.
    - Dust suppression (e.g., watering exposed surfaces and stockpiles of soils and/or excavated material, covering stockpiles with plastic tarps).
  - b) Sediment Control Measures:
    - Use of straw rolls, sediment fences, straw bales, and/or sediment traps to prevent sediment-laden runoff from leaving the construction area.
    - Use of temporary dikes to redirect or control runoff.
2. These measures would be installed before October 15 and monitored throughout the winter rainy season (October 15–March 15). The measures and monitoring requirements specified under the NPDES General Permit would minimize the potential for accelerated erosion and sedimentation. In addition, BART may receive assistance in defining and utilizing those BMPs via the Clean Water Program’s stormwater quality management plan. BART will verify that a notice of intent (NOI) and a SWPPP have been filed before allowing construction to begin. BART will routinely inspect the project site to verify that the BMPs specified in the SWPPP are properly installed and maintained. BART will immediately notify the contractor if there is a noncompliance issue and require compliance.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require that the contractor use appropriate sediment control measures, as described above.
2. BART staff will ensure and Monitor will verify that coverage under the NPDES general permit for stormwater associated with construction activities is obtained prior to construction.

3. Monitor will verify that all conditions of the NPDES permit, BMPs in the SWPPP, and specific erosion and sediment control measures are implemented during Project construction.

**Impact H-10—Water quality degradation at Lake Elizabeth, Mission Creek, Tule Pond, and Cañada de Aliso during construction.**

**Mitigation Measure H-10(a)—Implement water quality control measures to prevent release of sediment.**

1. BART will ensure that water quality control measures, such as turbidity barriers/curtains, are in place before construction activities begin in these areas, and before cofferdam installation. The barriers have pores that are large enough to allow water to pass through, but the pores are small enough to trap most sediments that may be suspended in the water. Measures will be installed on the west side of the cofferdam in Lake Elizabeth to prevent the release of disturbed lake-bottom sediments into the majority of the lake. Additional turbidity barriers/curtains or other appropriate measures will be installed at the outlet to Mission Creek to retain entrained lake-bottom sediments. BART may also use additional technologies to reduce potential impacts on water quality. These technologies may include, but not be limited to, the use of sheet piles instead of using an earthen cofferdam.
2. BART will also ensure that construction activities related to dewatering or the runoff of stormwater from Lake Elizabeth, Mission Creek, Tule Pond, and Cañada de Aliso will incorporate BMPs to minimize impacts on water quality. BMPs may include, but not be limited to, using sediment barriers (e.g., silt curtains), limiting the amount of exposed soils, and incorporating settling basins before discharge of water.

**Mitigation Measure H-10(b)—Obtain NPDES permit and implement permit conditions for all construction dewatering activities that discharge to surface waters.**

1. If feasible, wastewater generated as a part of construction dewatering will be either contained onsite such that there is no discharge to surface waters or discharged to the sanitary sewer for treatment at a wastewater treatment plant.
2. If discharge to surface waters is unavoidable, prior to engaging in construction-related dewatering activities, BART will obtain an NPDES permit and waste discharge requirements (WDRs) from the RWQCB. Depending on the volume and characteristics of the discharge, coverage under the General Construction Permit is possible. This permit contains numerical and narrative limits that are sufficiently protective of water quality such that impacts to surface water or groundwater as a result of dewatering effluent will be minimized.
3. If dewatering discharges are of a nature that will not allow coverage under the General Construction Permit, BART will need to obtain an individual NPDES permit for dewatering discharges, which will also contain standards such that water quality is not degraded.

4. During dewatering activities, all permit conditions will be followed. This will include the design and implementation of measures to meet permit conditions, such as retention of dewatering effluent until all particulate matter has settled before it is discharged, use of infiltration areas, and other BMPs. Final selection of water quality control measures will be subject to approval by RWQCB.
5. BART will verify that coverage under the appropriate NPDES permit has been obtained before allowing dewatering to begin. BART will routinely inspect the dewatering site to verify that measures specified in the permit are properly implemented and perform visual inspections of effluent to verify quality before the effluent is discharged. Inspections will include verification that the effluent is not discolored and does not exhibit sheens or films, which indicate the presence of contaminants other than sediment. If, during the dewatering permitting process, it is determined that there is reasonable potential for contaminants besides sediment to be found in dewatered effluent, BART will collect samples and conduct laboratory analyses for these constituents as part of the monitoring regime. For ongoing dewatering activities, monitoring will be performed at least biweekly. BART will immediately notify the contractor if there is a noncompliance issue and require compliance.

**Mitigation Measure H-10(c): Comply with City of Fremont MS-4 Permit.** BART will conduct any dewatering activities associated with the construction or operation of the Project according to the Waste Discharge Requirements for Facility-Wide Municipal Storm Water Discharges from Storm Sewer System and Non-Storm Water Discharges from the City of Fremont (MS4 Permit) issued by the San Francisco Bay RWQCB.<sup>5</sup>

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require that the contractor use specified water quality control measures.
2. BART staff will ensure and Monitor will verify that appropriate water quality control measures are implemented prior to construction and cofferdam installation.
3. BART staff will ensure and Monitor will verify that appropriate water quality control measures related to dewatering or stormwater runoff will incorporate BMPs to minimize impacts to water quality during construction.
4. BART staff will ensure and Monitor will verify that if dewatering discharge to surface waters is unavoidable, BART will obtain a NPDES permit and WDR for RWQCB.
5. BART staff will ensure and Monitor will verify that if necessary for dewatering discharges, BART will obtain an individual NPDES permit.
6. BART staff will ensure and Monitor will verify that BART routinely inspects the dewatering site and conduct a water quality monitoring regime.

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<sup>5</sup> This is a more stringent 2003 SEIR mitigation measure that is retained in the MMRP.

7. BART staff will ensure and Monitor will verify that dewatering activities associated with the Project are consistent with the MS-4 Permit.

**Impact H-11—Release of hazardous substances that violate water quality standards.**

**Mitigation Measure H-11—Implement hazardous materials spills prevention and control plan.** As part of its NPDES General Permit for Construction Activities, BART will be required to develop and implement a Storm Water Pollution Prevention Plan (SWPPP), which includes provisions for hazardous material spill prevention and control related to the use of construction equipment for the WSX Alternative. The SWPPP will describe storage procedures and construction site housekeeping practices and identify the parties responsible for monitoring and spill response. The measures and monitoring procedures required under the NPDES General Permit will minimize the potential for release of hazardous materials to the environment. BART will ensure the filing of the NOI for the NPDES permit and development and implementation of a SWPPP. BART will review the SWPPP before allowing construction to begin. BART will routinely inspect the project site to verify that the BMPs specified in the SWPPP are properly installed and maintained. BART will immediately notify the contractor if there is a noncompliance issue.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require that the contractor prepare and implement a hazardous materials spill prevention and control plan.
2. Monitor will verify in the field that the Hazardous Materials and Spill Prevention and Control Plan is being implemented and that BMPs are properly installed and maintained.

**Impact H-12—Potential depletion of local groundwater supplies during construction.**

**Mitigation Measure H-12—Develop and implement a construction dewatering plan.** Prior to construction, BART or BART's contractor will develop and implement a construction dewatering plan based on a comprehensive hydrogeological assessment of groundwater conditions in the Above Hayward Fault aquifer in the vicinity of the WSX alignment. The hydrogeological assessment will be developed with ACWD staff's assistance to determine the potential variations in groundwater levels in the subject aquifer. The location of testing wells will be determined in collaboration with ACWD. The testing will be completed prior to issuance of the notice to proceed to the contractor. BART will require BART's contractor to submit the construction dewatering plan to ACWD for its concurrence. The plan will identify the portions of subway construction that will be constructed using conventional dewatering techniques and those areas that would require alternative construction techniques, such as a jet-grouted base slab and/or deep soil mixing walls to minimize the need for groundwater pumping. The plan will address the potential effects of the selected construction techniques on groundwater level and will incorporate performance criteria developed in consultation with ACWD to limit pumping related to project dewatering.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that a comprehensive hydrogeological assessment is developed in conjunction with ACWD staff.
2. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require that the contractor prepares and implements a construction dewatering plan with the concurrence of ACWD.

**Impact H-13—Temporary reduction in flood storage capacity at Lake Elizabeth.****Mitigation Measure H-13(a)—Limit construction of cut-and-cover subway to the dry season.**

1. BART will close the cofferdam after April 1 and will complete construction and breach the cofferdam by November 1. Using this construction method, there would only be a small reduction in flood storage during the flood season (fill above the normal water level) and the construction period would be maximized.
2. If WSX Alternative construction at Lake Elizabeth cannot be completed between April 1 and November 1, Mitigation Measure H-13(b) will be instituted.

**Mitigation Measure H-13(b)—Create additional flood storage capacity equal to or greater than the temporary reduction in flood storage during construction.**

1. One or more of the following solutions could be employed to provide additional flood storage to offset the temporary reduction of flood storage during construction activities.
  - a) Actively manage the level of water within Lake Elizabeth to provide additional storage capacity equal to the storage loss.
  - b) Construct a second temporary cofferdam on the east side of the open trenching activities during construction and divert flows back into the eastern arm of Elizabeth Lake.
  - c) Construct additional storage facilities (e.g., detention basin) at the same location to provide additional storage capacity.
2. One or more of these solutions would be implemented with the review and concurrence of the City of Fremont and ACFCO.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require that the contractor limit construction of cut-and-cover subway within Lake Elizabeth to the dry season, if feasible.

2. If construction in Lake Elizabeth cannot be completed during the dry season, as described above, BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require that the contractor create additional flood storage capacity equal to or greater than the temporary reduction in flood storage during construction.
3. Monitor will verify in the field that construction of the cofferdam is consistent with the description above, or that a flood storage plan providing adequate capacity has been implemented.

**Impact H-14—Alteration of flooding conditions due to changes in infiltration rates, drainage patterns, or the rate and amount of surface runoff as a result of the presence of optional Irvington Station.**

**Mitigation Measure H-1—Design and implement a stormwater management system to safely convey stormwater.** This measure is described above.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require the contractor implement a stormwater management system for a 100-year design storm.
2. BART staff will ensure and Monitor will verify that BART submits the Project designs to ACFCD for approval to ensure that the Project does not exacerbate either upstream or downstream flooding conditions.
3. Monitor to verify in the field that the stormwater management plan is implemented.



## Wetlands

### Impact WL-1—Permanent loss of wetlands habitat.

#### Mitigation Measure WL-1—Restore, create, and protect wetland habitat to mitigate loss of wetland habitat.

1. To ensure that implementation of the WSX Alternative results in no net loss of wetland habitat functions and values, BART will compensate for the loss of wetland habitat at Tule Pond South, south of the Warm Springs Station site, and any other affected locations through a combination of onsite restoration/creation and offsite protection and enhancement of at least 0.8 acre of wetland habitat. The size and location(s) of the area(s) to be restored/created will be determined based on appropriate mitigation ratios derived in consultation with the Corps. A mitigation plan will be prepared by a wetland biologist experienced in mitigation and restoration. The plan will be implemented under the biologist's guidance. The California Regional Water Quality Control Board will be consulted regarding the effectiveness of the proposed mitigation plan. Subject to approval by the Corps, the wetland mitigation plan will address temporary and permanent impacts (temporary impacts are addressed below under Impact WL-5). Factors that will be considered in developing an effective mitigation plan in consultation with the Corps include the following.
  - a) Function and values: Wildlife species, percentage of vegetative cover and/or density, approximate plant height, plant and animal species diversity, root development, and canopy stratification.
  - b) Hydrological regime: Sources of water, discharge points, areas affected by seasonal flooding, direction of flow, and size of watershed.
2. Specific measurable criteria for the above factors will be incorporated into the plan in conformance with applicable regulatory requirements and the Corps' guidelines. Such criteria cannot be specifically identified at this stage, however, because the Corps has not visited the site.
3. Prior to any work that could disturb wetland or creek habitat within the WSX Alternative corridor, BART will obtain the following permits as required.
  - a) U.S. Army Corps of Engineers – Individual permit as required under Clean Water Act Section 404.
  - b) San Francisco Bay Regional Water Quality Control Board – Water quality certification as required under Clean Water Act Section 401.
  - c) California Department of Fish and Game – Streambed Alteration Agreement.

4. Consultation with these agencies will determine the implementation of this mitigation measure for disturbance of wetland and creek habitat.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications incorporate the above requirements to mitigate impacts to wetlands.
2. BART staff will ensure and Monitor will verify that a wetland mitigation plan, which addresses the appropriate functions, values and hydrological regime, has been prepared by a wetland biologist experienced in mitigation and restoration.
3. BART staff will ensure and Monitor will verify that the appropriate agency permits have been obtained prior to construction at the location of the impact.
4. Monitor will verify implementation of the wetland mitigation plan.

**Impact WL-2—Loss of riparian forest habitat.**

**Mitigation Measure WL-2—Enhance, recreate, or restore riparian forest to compensate for the loss of riparian forest habitat.**

1. BART will compensate for the permanent loss of riparian forest habitat at Tule Pond South and east of Mission Creek through onsite restoration/creation of 0.6 acre of forested riparian habitat west of the existing Tule Pond South site and east of Mission Creek. Compensation will be provided at a minimum ratio of 1:1 (1 acre restored or created for every acre removed). Restoration activities will occur after construction.
2. BART will retain a qualified restoration ecologist to develop a conceptual restoration and monitoring plan that describes how riparian habitat will be enhanced or recreated and monitored over a minimum period of time. BART will be responsible for ensuring that the restoration and monitoring plan is implemented.
3. After restoration and revegetation are completed, monitoring will be conducted for a minimum of 5 years to ensure that the success criteria identified below are met and to identify any necessary remedial actions. The revegetation/restoration plan for riparian habitats will be considered successful when the following criteria are met.
  - a) The restored site is composed of a mix of species similar to that removed during the construction activity; native species are planted where appropriate.
  - b) The restored site has at least 75% of the absolute cover of native vegetation present in areas immediately adjacent to the construction corridor.
  - c) Plantings are self-sustaining without human support (e.g., weed control, rodent and deer control, irrigation).
  - d) Functions and values of the restored habitat are comparable to those of adjacent undisturbed riparian habitat.

4. Remedial action will be required if any of the above criteria are not met during the monitoring period. The purpose of the remedial action will be to ensure that the above criteria are met.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications incorporate the above requirements to mitigate impacts to riparian forest habitat.
2. BART staff will ensure and Monitor will verify compensation will be provided at a minimum ratio of 1:1 (1 acre restored or created for every acre removed) and that restoration activities will occur after construction.
3. BART will ensure development of a conceptual restoration and monitoring plan.
4. BART staff will ensure and Monitor will verify that the appropriate agency permits have been obtained prior to construction at the location of the impact.
5. Monitor will verify implementation of the restoration plan and the continued monitoring for 5 years after restoration and revegetation are completed.

**Impact WL-4—Temporary disturbance of open water habitat.**

**Mitigation Measure WL-4—Install erosion barriers.** Require the construction contractor to use erosion barriers to prevent construction materials and excavated soil from entering any of the open water areas.

**Monitoring:**

BART staff will ensure and Monitor will verify in the field that erosion control barriers are installed during construction.

**Impact WL-5—Temporary disturbance of wetlands and creek habitat.**

**Mitigation Measure WL-5(a)—Avoid or minimize disturbance of wetlands and creeks.** At a minimum, mitigation for this impact will include the following measures.

1. All environmentally sensitive areas will be staked and flagged in the field and marked on construction drawings before construction begins. BART's construction contractor(s) will avoid construction activities in and adjacent to creeks and saturated or ponded wetlands during the wet season (winter and spring) to the maximum extent possible. Wetlands and creek habitats on and near active construction sites will be protected by installing environmentally sensitive area fencing (orange construction barrier fencing) at least 20 feet outboard of the edge of the ordinary high-water mark; depending on site-specific conditions and permit requirements, the buffer may be wider than 20 feet to prevent erosion and sedimentation impacts on wetland habitats. Construction specifications for the WSX Alternative will include language that specifically prohibits construction-related activities,

including vehicle laydown and operation, storage of materials and equipment, and other ground-disturbing activities, in fenced environmentally sensitive areas.

2. BART will retain qualified biologists and/or resource specialists to monitor construction activities near wetlands and creeks. Monitors will be hired and trained prior to construction, and will be responsible for preconstruction surveying, staking and fencing sensitive resources, onsite monitoring, documenting compliance and violations, coordinating with contract compliance inspectors, and performing postconstruction documentation.
3. Contractors will ensure that woody debris, soils, and any other materials that are inadvertently deposited below the ordinary high-water mark of drainages are removed. Removal will be accomplished by qualified personnel in a manner that minimizes disturbance of drainage bed and banks.
4. If it is not possible to avoid ground-disturbing activities in or adjacent to environmentally sensitive areas, including creeks and/or saturated or ponded wetlands, the following measures will be implemented to minimize disturbance.
  - a) When working in or adjacent to creeks or wetlands, contractors will use geotextile cushions or other appropriate materials (e.g., timber pads, prefabricated equipment pads) to minimize damage to the substrate and vegetation and increase the likelihood of successful restoration.
  - b) When working upslope of creeks or wetlands, contractors will use geotextile mats, excelsior blankets, or other soil stabilization products to minimize the potential for construction to contribute to erosion and sedimentation that could affect wetland water quality.
  - c) Contractors will stabilize exposed slopes and streambanks immediately on completion of ground-disturbing activities, using a non-vegetative material that will bind the soil initially and break down within a few years.

#### **Mitigation Measure WL-5(b)—Restore disturbed wetlands and creek habitat.**

1. To ensure that implementation of the WSX Alternative results in no net loss of wetland and creek habitat functions and values, BART will ensure that wetlands and creeks disturbed during construction activities are restored and/or revegetated. BART will comply with any measures required by the Corps as part of the Section 404 permitting process.
2. In addition, BART will retain a qualified restoration ecologist to develop a restoration/revegetation plan for wetlands and creeks adversely affected by construction activities, in conjunction with resource and regulatory agency staff. The restoration/revegetation plan will include design specifications, an implementation plan, maintenance requirements, and a monitoring program.
3. After restoration and revegetation are completed, monitoring will be conducted for a minimum of 5 years to ensure that the success criteria identified below are met and to identify any necessary remedial actions. Annual monitoring reports will be submitted to the Corps and the San Francisco Bay RWQCB. The reports will summarize the data collected

during each monitoring period, describe the progress of the restored habitats relative to the success criteria outlined below, and discuss any remedial actions performed.

4. The revegetation/restoration plan for wetland and creek habitats will be considered successful when the following criteria are met.
  - a) The restored site is composed of a mix of species similar to that removed during the construction activity.
  - b) The restored site has at least 75% of the absolute cover of native vegetation present in areas immediately adjacent to the construction corridor.
  - c) Plantings are self-sustaining without human support (e.g., weed control, rodent and deer control, irrigation).
  - d) Functions and values of the restored habitat are comparable to those of adjacent undisturbed wetland and creek habitats.
5. Remedial action will be required by BART if any of the above criteria are not met during the monitoring period. The purpose of the remedial action will be to ensure that the above criteria are met.

**Mitigation Measure WL-5(c)—Compensate for temporary loss of wetlands and creek habitat.** To compensate for the temporary loss of wetlands and creek habitat during construction, BART will implement Mitigation Measure WL-1 (Restore, create, and protect wetland habitat to mitigate loss of wetland habitat) discussed above. As discussed above in this mitigation measure, the size of the area(s) to be restored/created will be determined based on appropriate mitigation ratios derived in consultation with the Corps.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require that the contractor to avoid or minimize the disturbance of creeks and wetlands, and where necessary, restore disturbed areas as described above. Project specifications will include language that specifically prohibits construction-related activities, including vehicle laydown and operation, storage of materials and equipment, and other ground-disturbing activities in fenced environmentally sensitive areas.
2. BART staff will ensure and Monitor will verify that the appropriate agency permits have been obtained prior to construction at the location of impact.
3. Monitor will verify in the field that all environmentally sensitive areas are staked and flagged in the field and marked on construction drawings before construction begins, the contractor(s) avoid construction activities in and adjacent to creeks and saturated or ponded wetlands during the wet season (winter and spring) to the maximum extent possible, and that wetlands and creek habitats on and near active construction sites are protected by installing environmentally sensitive area fencing.

4. BART staff will ensure and Monitor will verify that resource specialists are retained to monitor construction activities near wetlands and creeks.
5. Monitor will verify in the field that contractors remove woody debris, soils, and any other materials that are inadvertently deposited below the ordinary high-water mark of drainage channels and creeks.
6. BART staff will ensure and Monitor will verify that, if it is not possible to avoid ground-disturbing activities in or adjacent to environmentally sensitive areas, the appropriate measures are implemented, as described above, to minimize damage and stabilize soils and slopes.
7. BART staff will ensure and Monitor will verify that BART retains a qualified restoration ecologist to develop a restoration/revegetation plan for wetlands and creeks affected by the project.
8. Monitor will verify that the restoration plan is implemented.

**Impact WL-6—Temporary disturbance of riparian forest habitat.**

**Mitigation Measure WL-6(a)—Minimize disturbance of riparian habitats.**

1. BART's construction contractor(s) will avoid construction activities in and adjacent to riparian habitats to the maximum extent possible. Riparian habitats on and near active construction sites will be protected by installing environmentally sensitive area fencing (orange construction barrier fencing) outboard of (upslope from) the edge of the riparian zone. Depending on site-specific conditions, the buffer may be wider than 20 feet, as needed to protect the area from erosion. The locations of fences will be marked in the field with stakes and flags and will be shown on the construction drawings.
2. If it is not possible to avoid work in riparian areas, BART's construction contractor(s) will minimize impacts on riparian forest vegetation by trimming vegetation rather than removing entire shrubs or trees wherever practicable. Shrubs will be cut at least 1 foot above ground level to leave the root systems intact and allow for more rapid regeneration. Cutting will be limited to the minimum area necessary in the construction zone. To protect migratory birds, no removal of woody riparian vegetation will take place during the breeding season (March 1–August 1).

**Mitigation Measure WL-6(b)—If it is not possible to avoid work in riparian areas, restore disturbed riparian forest areas.**

1. BART will ensure that the riparian forest disturbed during construction activities is restored and/or revegetated.
2. BART will retain a qualified restoration ecologist to develop a revegetation plan for riparian forest adversely affected by construction activities. The revegetation plan will include design specifications, an implementation plan, maintenance requirements, and a monitoring program. To help develop the plan, the restoration ecologist will qualitatively sample the riparian vegetation in the WSX Alternative corridor prior to construction. Revegetation will

be implemented immediately following disturbance in substantially disturbed areas or as appropriate for site conditions, based on the evaluation of the restoration ecologist and input from agency staff. Weeds will be vigorously controlled within and adjacent to the restoration site to ensure that no new noxious weeds are introduced into the area.

3. Monitoring will be conducted by BART for a minimum of 5 years to document the degree of success in achieving the success criteria identified below and to identify any necessary remedial actions. The reports will summarize the data collected during each monitoring period, describe the progress of restored habitats relative to the success criteria outlined below, and discuss any remedial actions performed.
4. The revegetation plan for riparian habitat will be considered successful when the following criteria are met.
  - a) The riparian habitat established is composed of a mix of native species similar to that removed by the construction.
  - b) The absolute cover of riparian vegetation is at least 75% of that in adjacent riparian areas not impacted by construction.
  - c) The health and vigor of riparian vegetation in the planted areas is similar to that of individuals of the same species in adjacent riparian areas, based on a qualitative comparison of leaf turgor, stem caliber, leaf cover and foliage density.
  - d) Plantings are self-sustaining without human support (e.g., weed control, rodent control, or irrigation).

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require that the contractor avoid construction activities in and adjacent to riparian habitats to the maximum extent possible, as described above.
2. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require that, if it is not possible to avoid work in riparian areas, the contractor minimize disturbance of riparian habitats, and where necessary, restore disturbed areas, as described above.
3. Monitor will verify in the field that all environmentally sensitive areas are staked and flagged in the field and marked on construction drawings before construction begins. Riparian habitat on or near active construction sites shall be protected by installing environmentally sensitive area fencing.
4. Monitor shall verify in the field that cutting will be limited to the minimum amount necessary in the construction zone.

5. BART staff will ensure and Monitor will verify that BART retains a qualified restoration ecologist to develop and implement a revegetation plan for riparian forest affected by the project.
6. Monitor will verify that the revegetation plan is implemented.



## Biological Resources

### Impact BIO-3. Loss of occupied Western Burrowing Owl habitat and direct impacts on Western Burrowing Owls.

#### Mitigation Measure BIO-3: Implement on- and offsite replacement of Western Burrowing Owl habitat.

1. BART will ensure that the loss of Western Burrowing Owl habitat in the Project corridor is compensated by the provision of replacement habitat either on-site or offsite. Habitat replacement will be based on a biological analysis of the requirements of the owls at this site, or CDFG-approved guidelines (California Department of Fish and Game 1995).
2. Location of the compensation habitat will be identified in conjunction with CDFG through a mitigation agreement. Compensation habitat may be located either on-site or off-site, depending on approval from CDFG. If necessary, BART will construct two artificial burrows for each occupied burrow lost or rendered unsuitable as a result of construction activities. BART will retain a qualified biologist to build and monitor the artificial burrows. BART will ensure that the mitigation habitat (including artificial burrows) is maintained for owls in perpetuity.

#### Monitoring:

BART staff will ensure and **Monitor** will verify that the loss of Western Burrowing Owl habitat in the Project corridor is compensated per the requirements of CDFG.

### Impact BIO-4—Removal of trees.

**Mitigation Measure BIO-4(a)—Conduct a tree survey to assess tree resources affected by the WSX Alternative.** BART will retain a certified arborist to conduct a tree survey of the WSX Alternative corridor, including potential contractor laydown areas, and to identify and evaluate trees that will be removed, **including** any landmark trees as identified by the City of Fremont. If the arborist's survey does not identify any protected trees or known landmark trees that would be removed or damaged as a result of the WSX Alternative, no further mitigation is necessary. However, if the WSX Alternative would remove or damage any protected tree(s), Mitigation Measure BIO-4(b) as described below will also be implemented.

**Mitigation Measure BIO-4(b)—Provide replacement trees for the removal of protected trees.** For any tree with a trunk diameter in excess of 6 inches measured at 4.5 feet above ground level that is removed as a result of the WSX Alternative,<sup>6</sup> BART will ensure that replacement trees are planted in the WSX Alternative corridor. At a minimum, each removed tree that meets the 6-inch standard will be replaced with either (1) one replacement tree of 24-inch box size, or

<sup>6</sup>The 2003 SEIR required tree replacement for trees with a trunk diameter in excess of 4 inches at 4 feet above ground level. The revised mitigation requirements reflect changes to the City of Fremont's tree ordinance.

(2) three replacement trees of 15-gallon size. Replacement trees will be native species such as coast live oak (*Quercus agrifolia*), California buckeye (*Aesculus californica*), California bay laurel (*Umbellularia californica*), or other appropriate species native to the Fremont area or similar to the mix of species removed during construction activity. Trees will be planted in close proximity to removal sites, in locations suitable for the replacement species. Selection of replacement sites and installation of replacement plantings will be supervised by a qualified botanist. Newly planted trees will be monitored by a qualified botanist at least once a year for 5 years. Any trees that do not survive during that period will be replaced. Any trees planted as remediation for failed plantings will be planted as stipulated here for original plantings, and will be monitored for a period of 5 years following installation. Tree replacement will occur after project construction.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that a tree survey is conducted by a certified arborist, including identification of landmark trees.
2. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require that replacement trees be planted to compensate for removal of any tree with a trunk diameter in excess of 6 inches measured at 4.5 feet above ground level within the project corridor.
3. Monitor will verify in the field that the tree replacement plan is implemented.

**Impact BIO-6—Temporary disturbance of ruderal forb-grassland.**

**Mitigation Measure BIO-6(a)—Minimize and avoid forb-grassland habitat.** The following minimization and avoidance measures will be implemented to ensure pre-project conditions are restored in areas where ruderal forb-grassland habitat is temporarily disturbed.

1. Remove as little vegetation as possible.
2. Replace topsoil and replant the 37.8 acres of grassland habitat, using a mixture of native perennial and annual grasses and forbs.
3. Minimize construction activities in sensitive habitat areas.

**Mitigation Measure BIO-6(b)—Minimize erosion of stockpiled soil.** During construction, measures necessary to prevent erosion and pollution from the excavated and stockpiled soil, such as the use of geotextiles, will be implemented.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require that the contractor minimize and avoid where possible the disturbance of ruderal forb-grassland, as described above.

2. Monitor will verify in the field` that disturbance to ruderal forb-grassland is minimized as described above.

### **Impact BIO-8—Temporary disturbance of habitat for Western Burrowing Owl.**

#### **Mitigation Measure BIO-8—Conduct preconstruction surveys for nesting and wintering Burrowing Owls, and implement measures to avoid or minimize impacts if owls are present.**

1. If construction activities are scheduled to occur during the breeding season (approximately February 1–August 31), BART, in consultation with CDFG, will retain a qualified biologist to conduct a preconstruction survey within 1 to 2 weeks of the onset of construction activities. If active Western Burrowing Owl nests are found, biologists will establish a 250-foot buffer zone around the active burrow(s). The buffer zone(s) will be delineated with highly visible temporary construction fencing. No construction activities will occur until a qualified biologist has determined that the young have fledged.
2. Preconstruction surveys will also be conducted if activities are scheduled to occur during the non-breeding season (September 1–January 31). If Western Burrowing Owls are found, BART will either implement avoidance measures or will passively relocate the owls. Avoidance will involve establishing a 160-foot no-disturbance buffer zone that will be delineated with highly visible temporary construction fencing. Passive relocation will involve installation of one-way doors in the entrances of all burrows in areas where construction is slated to occur. One-way doors will be installed at least 48 hours before construction begins, and will be monitored for 1 week. Following the monitoring period, the burrows will be excavated to prevent reoccupation by owls.

#### **Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require a preconstruction survey and mitigation measures for the burrowing owls, as described above.
2. BART staff will ensure and Monitor will verify that, if construction activities are scheduled to occur during the breeding season, BART, in consultation with CDFG, will retain a qualified biologist to conduct a preconstruction survey.
3. If active Western Burrowing Owl nests are found during the breeding season, BART staff will ensure and Monitor will verify that a 250-foot buffer zone around the active burrow(s) is implemented.
4. BART staff will ensure and Monitor will verify that, if Western Burrowing Owls are found during the non-breeding season, avoidance measures or passive relocation of the owls, as described above, is implemented.

**Impact BIO-9—Temporary noise disturbance of nesting common and special-status raptors. (2006 EIS)****Mitigation Measure BIO-9—Conduct a preconstruction survey for nesting raptors, and implement measures to avoid or minimize impacts if nesting special-status raptors are present.**

1. No mitigation is required if construction occurs during the non-breeding season (August 16–February 28). However, if construction activities occur between March 1 and August 15, BART will retain a qualified biologist to conduct a preconstruction survey for special-status raptor species in the WSX Alternative corridor, including contractor laydown areas. The survey, which will be conducted during the calendar year in which the activity is slated to begin, will determine whether nesting special-status birds of prey would be affected. The results of the survey will be considered valid only for the season in which the survey was conducted; if phased construction is planned, an additional survey or surveys may be required.
2. If the survey does not identify any nesting special-status raptor species in the area potentially affected by the proposed activity, no further mitigation is required.
3. If nesting special-status raptors are found during a preconstruction survey, the biologist will identify and establish a buffer area around each active raptor nest. No construction activities will take place inside the buffer area until the biologist has determined that the young have fledged or the parents are no longer attempting to nest. The size of the buffer area will be determined in consultation with CDFG, based on site conditions. Examples of approved buffers include the following.
  - a) Northern Harrier – minimum 200-foot radius around active nest.
  - b) Cooper’s Hawk – minimum 500-foot radius around active nest.
  - c) White-tailed Kite – minimum of 500-foot radius around active nest.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require a preconstruction survey and mitigation measures, as described above, if nesting raptors are found.
2. BART staff will ensure and Monitor will verify that, if construction activities occur between March 1 and August 15, BART will retain a qualified biologist to conduct a preconstruction survey for special-status raptor species.
3. Monitor will verify that, if nesting special-status raptors are found during a preconstruction survey, the biologist will identify and establish a buffer area around each active raptor nest. Monitor will verify that no construction activities will take place inside the buffer area until the young have fledged or the parents are no longer attempting to nest.

**Impact BIO-11—Temporary disturbance of nesting swallows.**

**Mitigation Measure BIO-11—Avoid construction during swallow nesting season or remove empty nests and prevent new nesting.** No mitigation is required if construction in potential swallow nesting habitat occurs entirely outside the swallow nesting season (March 1–August 1). However, if construction activities occur in potential swallow nesting habitat during the nesting season, BART will retain a qualified wildlife biologist to inspect known and potential nest sites during the non-breeding season (September 1–February 28). Abandoned nests will be removed. If swallows begin constructing new nests during the breeding season, a qualified wildlife biologist will remove the nests before nesting swallows complete nest construction. Construction in nesting swallow habitat will not begin before September 1, or until after USFWS issues appropriate removal permits.

**Mitigation Measure WL-6(a)—Minimize disturbance of riparian habitats.** This mitigation measure is described in Section 4.6, *Wetlands*, of the FEIS. In this case, this mitigation measure applies specifically to impacts on nesting Tree Swallows because this species typically nests in riparian habitat.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications to require the contractor to avoid construction during swallow nesting season or remove nests to prevent new nesting.
2. BART staff will ensure and Monitor will verify that BART will retain a qualified biologist to conduct a preconstruction inspection and, if necessary, remove nests prior to construction.

**Impact BIO-12—Disturbance or loss of wetlands and upland habitat identified as potential habitat for California red-legged frog.**

**Mitigation Measure BIO-12(a)—Implement measures to avoid, minimize, and compensate for disturbance of California red-legged frog and California tiger salamander habitat at South Tule Pond and New Marsh.** Implementation of the following avoidance, minimization, and compensation measures prior to, during, and after construction will ensure that construction of the WSX Alternative does not adversely affect California red-legged frogs and California tiger salamander.

1. A pre-construction survey will be conducted immediately preceding any construction activity (including grading or equipment staging) that occurs in red-legged frog or tiger salamander habitat or an activity that may result in take of these species. A qualified biologist approved by US Fish and Wildlife Service (USFWS) will carefully search all obvious potential hiding spots for red-legged frogs or tiger salamanders, such as large downed woody debris, the perimeter of pond or wetland habitat, and the riparian corridor associated with streams and drainages. Any red-legged frog or tiger salamander found will be captured and held for the minimum amount of time necessary to release them in suitable habitat outside of the work area. Suitable release sites will be approved by the USFWS prior to the start of construction activities.

2. Prior to the start of construction, a qualified biologist approved by USFWS will train all construction personnel regarding habitat sensitivity, identification of special status species, and required practices before the start of construction. The training will include the general measures that are being implemented to conserve these species as they relate to the project, the penalties for non-compliance, and the boundaries of the project area. If new construction personnel are added to the project, the contractor will ensure that the personnel receive the mandatory training before starting work. A fact sheet or other supporting materials containing this information will be prepared and distributed to all construction personnel. Upon completion of training, construction personnel will sign a form stating that they attended the training and understand all the conservation and protection measures. Training will be conducted and information sheets prepared in languages other than English, as appropriate.
3. In the South Tule Pond work area, ground-disturbing construction activities will be limited to the period from May 1 through October 31.
4. Because dusk and dawn are often the times when red-legged frogs are most actively foraging and dispersing, all construction activities in the South Tule Pond work area will cease one-half hour before sunset and will not begin prior to one-half hour before sunrise.
5. Permanent and temporary construction disturbances and other types of project-related disturbance to red-legged frog or tiger salamander habitat will be minimized to the maximum extent practicable and confined to the designated work area as shown on Figures 4.7-3 and 4.7-4 and identified on the construction plans. To minimize temporary disturbances, all project-related vehicle traffic will be restricted to established roads, construction work areas, and other designated areas. At no time will equipment or construction personnel be allowed to adversely affect areas outside the designated work area without authorization from the USFWS. These work areas should be included in preconstruction surveys and, to the maximum extent possible, should be established in locations disturbed by previous activities to prevent further adverse effects.
6. In Fremont Central Park, the work area will begin 200 feet from the edge of New Marsh (potential red-legged frog or tiger salamander breeding habitat), thereby creating a 200-foot no-disturbance buffer zone around New Marsh. Prior to the start of construction including grading and equipment staging, the contractor (working with the USFWS-approved biologist) will install suitable tiger salamander and red-legged frog exclusion fencing between the New Marsh 200-foot no-disturbance buffer and the work area. The extent of the exclusion fencing will be identified on the construction plans as an environmentally sensitive habitat area. Exclusion fencing will be a minimum of 36 inches high and constructed of either Dupont vexar plastic sheeting (14 x 6 mm mesh) or plywood buried at least 4 inches underground. Exclusion fencing will be maintained throughout the entire construction period.
7. A biologist approved by USFWS will monitor all ground-disturbing construction activity within suitable habitat. After ground-disturbing activities are complete, the USFWS-approved biologist will train an individual to act as the on-site construction monitor. The construction monitor will have attended the training described previously in this mitigation measure (see second bulleted item). Both the USFWS-approved biologist and the construction monitor will have the authority to stop and/or redirect project activities to ensure

protection of resources and compliance with all environmental permits and conditions of the project. The USFWS-approved biologist and construction monitor will complete a daily log summarizing activities and environmental compliance.

8. A biologist approved by USFWS will oversee the implementation of all the Terms and Conditions in the biological opinion, and will have the authority to stop project activities if any of the requirements associated with the Terms and Conditions are not being fulfilled. If the biologist has requested a stop work due to take of any of the listed species, the USFWS and the California Department of Fish and Game will be notified within one (1) working day via email or telephone.
9. If a red-legged frog or tiger salamander is encountered during project construction, all construction activities in the immediate area will cease until the animal is removed and relocated by a USFWS-approved biologist to suitable habitat outside the work area (see first bulleted item associated with this mitigation measure).
10. If an injured or dead red-legged frog or tiger salamander (including adults, tadpoles, and eggs) is found during project construction, USFWS will be notified within one (1) working day. Injured red-legged frogs or tiger salamanders shall be cared for by a licensed veterinarian or other qualified person. Notification of the injured or dead animal must include the date, time, and location of the incident or finding of a dead animal clearly indicated on a US Geological Survey (USGS) 7.5-minute quadrangle and other maps at a finer scale, and any other pertinent information. This information will be provided to the following individuals: Chris Nagano, Deputy Assistant Field Supervisor, Endangered Species Program at the Sacramento Fish and Wildlife Office at (916-414-6648); Scott Heard, Resident Agent-in-Charge of the USFWS's Law Enforcement Division (916-414-6660); and Ron Schlorff, Department of Fish and Game at 1416 9th Street, Sacramento, California 95814 (916-654-4262).
11. Any person capturing or handling tiger salamanders or red-legged frogs will be a qualified biologist approved by the USFWS (USFWS-approved biologist). A qualified biologist means any person who has completed at least four years of university training in wildlife biology or a related science and/or has demonstrated field experience in the identification and life history of the tiger salamander or red-legged frog. Resumes of all biologists proposed to capture or handle red-legged frogs and tiger salamanders will be submitted to the USFWS no later than 30 days prior to the start of construction for approval.
12. Nets or bare hands may be used to capture tiger salamanders or red-legged frogs. USFWS-approved biologists will not use soaps, oils, creams, lotions, repellents, or solvents of any sort on their hands within two hours before and during periods when they are capturing and relocating red-legged frogs or tiger salamanders. To avoid transferring disease or pathogens between aquatic habitats during the course of surveys or handling of red-legged frogs or tiger salamanders, USFWS-approved biologists will follow the Declining Amphibian Populations Task Force's "Code of Practice." USFWS-approved biologists will limit the duration of handling and captivity of red-legged frogs or tiger salamanders. While in captivity, individuals of these species will be kept in a cool, moist, aerated environment, such as a bucket containing a damp sponge. Containers used for holding or transporting adults of these species will not contain any standing water.

13. All vehicle parking will be restricted to previously determined areas or existing roads. Necessary vehicles belonging to the biological monitors and construction supervisors will be parked at the nearest point on existing access roads.
14. Rodent control will be permitted only in developed portions of the project area. Rodent control will not be implemented in any of the open space areas. The method of rodent control will comply with the methods of rodent control discussed in the 4(d) rule published in the final listing rule for the tiger salamander (FR 69:47212-47248).
15. Tightly woven fiber netting or similar material will be used for erosion control or other purposes at the project site to ensure that the red-legged frog and/or the tiger salamander do not get trapped. This limitation will be communicated to the contractor through use of Special Provisions included in the bid solicitation package. Coconut coir matting is an acceptable erosion control material. No plastic mono-filament matting will be used for erosion control.
16. A representative will be appointed by BART to serve as the contact/resource for any employee or contractor who might inadvertently kill or injure a red-legged frog or tiger salamander or who finds a dead, injured or entrapped individual. The representative will be identified during the employee education program. The representative's name and telephone number will be provided to the USFWS prior to the initiation of ground disturbance activities.
17. No canine or feline pets or firearms (except for Federal, State, or local law enforcement officers and security personnel) will be permitted in the work area to avoid harassment, killing, or injuring of tiger salamanders or red-legged frogs. Because the work area occurs in a park/residential setting, canine or feline pets may be present in the vicinity of the work area.
18. A litter control program will be instituted at the project site. All construction personnel will ensure that their food scraps, paper wrappers, food containers, cans, bottles, and other trash from the project area are deposited in covered or closed trash containers. The trash containers will be removed from the project area at the end of each working day.
19. BART will notify USFWS when project construction in red-legged frog and tiger salamander habitat at South Tule Pond and New Marsh is complete. A written report will be submitted to USFWS, containing, at minimum, the following information: (1) a brief summary of the project actions, construction methods and materials used to minimize effects to red-legged frog and tiger salamander habitat; (2) the number of red-legged frog and tiger salamanders (including adults, tadpoles, and eggs) relocated from the construction area and a brief description of their condition (i.e., healthy, lethargic, stunned, noticeable injuries, deformed, etc.); (3) a summary of all red-legged frog or tiger salamander injured or killed; (4) any problems that occurred that might have prevented compliance with the above measures; and (5) methods to avoid these problems in the future.
20. BART will include Special Provisions that include the above listed avoidance and minimization measures in the solicitation for bid information when applicable. In addition, BART will educate and inform contractors involved in the project as to the requirements of the biological opinion.



**Mitigation Measure BIO-12(b). Compensate for permanent and temporary impacts to California red-legged frog and California tiger salamander habitat at South Tule Pond and Fremont Central Park.** BART will compensate for the permanent and temporary effects on aquatic and upland habitat for red-legged frog at South Tule Pond and Fremont Central Park and permanent and temporary effects on upland habitat for tiger salamander at Fremont Central Park by preserving suitable aquatic and upland habitat at the Ohlone Preserve Conservation Bank in Alameda County (Ohlone Bank). For purposes of compensation, aquatic habitat and upland habitat will be analyzed together. Permanent effects on habitat will be compensated at a ratio of 3:1 (replacement:lost) and temporary effects at a ratio of 1.1:1 (1.0 acre will be restored onsite to pre-project conditions and 0.1 acre will be preserved at the Ohlone Bank). Acreages of habitat affected and compensation land to be preserved or restored are summarized in Table 4.7-7 of the FEIS. Based on these estimates, BART will preserve 12.2 acres of suitable habitat at the Ohlone Bank (6.6 acres of red-legged frog habitat and 5.6 acres of combined tiger salamander and red-legged frog habitat). BART will provide a letter of intent to purchase conservation credits at the Ohlone Bank within 60 days from after issuance of the biological opinion for the proposed action, and BART will purchase conservation credits at the Ohlone Bank within 6 months of the issuance of the biological opinion. [This mitigation measure was completed on August 14, 2006.]

**Mitigation Measure BIO-12(c). Biological Monitoring.** The following monitoring measures will be implemented:

1. Biological monitors will be selected by and report directly to the BART Project Manager (PM). Biological monitors will work in close coordination with BART's Construction Management Oversight (CMO) consultants, who will have day-to-day oversight responsibility for the contractor's activities in the field. At no time will the biological monitors be responsible to or come under the authority of the contractor in the performance of their duties. Biological monitors shall have the authority, through the PM and/or CMO, to stop or re-direct project activities to ensure protection of resources and compliance with all environmental permits and conditions of the project.
2. Primary lines of communication will be between the monitor(s) and the PM. The PM will be responsible for environmental compliance and reporting. The PM will take the lead in addressing any non-compliance issues. If there is a non-compliance issue, the PM will notify the appropriate agencies.
3. Monitors will be kept informed of construction activities by the PM and CMO. Monitors will participate in daily briefings of activities and be in constant communication with the PM and CMO by radio or cell phone. Monitors will file a daily written log.
4. Biological monitors will provide the PM with regular reports of monitoring activities, which shall be compiled and reviewed on at least a quarterly basis, or more frequently if necessary, depending on construction activity. The reports will be made available to interested agencies such as FTA, FTA's project management oversight consultant, USFWS, CDFG, and any other agency that requests copies. As with the written environmental reports, BART will conduct environmental coordination meetings with reviewing agencies on a quarterly basis, or more frequently, if necessary.

5. Sensitive habitat areas will be clearly delineated in the field from contractor work areas by exclusion fencing. As required under conditions of the Biological Opinion, the contractor will remain within the contractor work areas that are illustrated on Figures 4.7-3 and 4.7-4 of the FEIS
6. BART will include financial penalties for noncompliance with biological mitigation measures in the contract documents as an incentive to avoid sensitive habitat areas.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts include the special provisions for species avoidance and impact minimization listed above.
2. BART staff will ensure and Monitor will verify in the field that pre-construction surveys have been conducted.
3. BART staff will ensure and Monitor will verify that a qualified biologist approved by USFWS has trained all construction personnel regarding sensitive habitat and required species protection measures.
4. BART staff will ensure and Monitor will verify that all requirements for protection of sensitive habitat have been implemented and are maintained for the duration of construction.
5. BART staff will ensure and Monitor will verify that a biologist approved by USFWS monitors all ground disturbing activities, and has the authority to stop and/or redirect activities to ensure protection of resources.
6. BART staff will ensure and Monitor will verify that when project work in South Tule Pond and New Marsh is complete, a written post-construction report is submitted to USFWS.
7. BART staff will ensure and Monitor will verify that biological monitors report directly to the BART project manager and at no time will they be under the authority of the contractor.
8. BART staff will ensure and Monitor will verify that biological monitors participate in daily briefings of activities and file a daily written log.
9. BART staff will ensure and Monitor will verify that regular reports of monitoring activities are made, compiled and reviewed.
10. BART staff will ensure and Monitor will verify that financial penalties for noncompliance with biological mitigation measures are enforced.

**Impact BIO-13—Permanent and Temporary disturbance of potential California tiger salamander upland estivation habitat.**

**Mitigation Measure BIO-12(a)—Implement measures to avoid, minimize, and compensate for disturbance of California red-legged frog and California tiger salamander habitat at South Tule Pond and New Marsh.** This measure has been described above.

**Mitigation Measure BIO-12(b). Compensate for permanent and temporary impacts to California red-legged frog and California tiger salamander habitat at South Tule Pond and**

**Fremont Central Park.** This measure has been described above. [This mitigation measure was completed on August 14, 2006.]

**Mitigation Measure BIO-12(c). Biological Monitoring.** This measure has been described above.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts include the special provisions for species avoidance and impact minimization listed above.
2. BART staff will ensure and Monitor will verify in the field that pre-construction surveys have been conducted.
3. BART staff will ensure and Monitor will verify that a qualified biologist approved by USFWS has trained all construction personnel regarding sensitive habitat and required species protection measures.
4. BART staff will ensure and Monitor will verify that all requirements for protection of sensitive habitat have been implemented and are maintained for the duration of construction.
5. BART staff will ensure and Monitor will verify that a biologist approved by USFWS monitors all ground disturbing activities, and has the authority to stop and/or redirect activities to ensure protection of resources.
6. BART staff will ensure and Monitor will verify that when project work in South tule Pond and New Marsh is complete, a written post-construction report is submitted to USFWS.
7. BART staff will ensure and Monitor will verify that biological monitors report directly to the BART project manager and at no time will they be under the authority of the contractor.
8. BART staff will ensure and Monitor will verify that biological monitors participate in daily briefings of activities and file a daily written log.
9. BART staff will ensure and Monitor will verify that regular reports of monitoring activities are made, compiled and reviewed.
10. BART staff will ensure and Monitor will verify that financial penalties for noncompliance with biological mitigation measures are enforced.

**Impact BIO-16—Potential for fish stranding leading to mortality during dewatering activities.**

**Mitigation Measure BIO-16—Capture and relocate any stranded fish during dewatering activities.** A CDFG-permitted biologist familiar with fish capture techniques will monitor dewatering activities in the isolated eastern arm of Lake Elizabeth and Mission Creek. The biologist should be experienced with fish capture, holding, and transfer techniques. The biologist will use seining, dip netting, or other appropriate techniques to capture stranded fish as dewatering is occurring. Pumps used to dewater areas should be appropriately screened to prevent fish entrainment. Flow in Mission Creek should be diverted around construction sites in increments (e.g., 25%, 50%, 75%, and 100%) if practicable to allow time for fish to escape

dewatering sites. Downstream flow in Mission Creek will not be interrupted at any time (i.e., a live stream must be present in reaches downstream of dewatered segments at all times). Any rescued fish will be immediately placed into an aerated holding tank for subsequent release to Mission Creek or Lake Elizabeth, as appropriate. Monitoring will continue until all stranded fish are rescued and relocated and the dewatering is complete.

**Monitoring:**

BART staff will ensure and Monitor will verify that a biologist familiar with fish capture will monitor the dewater activities at Lake Elizabeth and use appropriate methods to allow fish to rescue fish release them to Mission Creek or Lake Elizabeth.

**Impact BIO-18—Removal of protected trees from Irvington Station site.**

**Mitigation Measure BIO-4(a)—Conduct a tree survey to assess tree resources affected by the WSX Alternative.** This measure was described above.

**Mitigation Measure BIO-4(b)—Provide replacement trees for the removal of protected trees.** This measure was described above.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that a tree survey is conducted by a certified arborist, including identification of landmark trees.
2. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require that replacement trees be planted to compensate for removal of any tree with a trunk diameter in excess of 4 inches measured at 4 feet above ground level within the project corridor.
3. Monitor will verify in the field that the tree replacement plan is implemented.

**Impact BIO-19—Temporary noise disturbance of common and special-status nesting raptors at optional Irvington Station site.**

**Mitigation Measure BIO-9—Conduct a preconstruction survey for nesting raptors, and implement measures to avoid or minimize impacts if nesting special-status raptors are present.** This measure is described above.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require a preconstruction survey and mitigation measures, as described above, if nesting raptors are found.
2. BART staff will ensure and Monitor will verify that, if construction activities occur between March 1 and August 15, BART will retain a qualified biologist to conduct a preconstruction survey for special-status raptor species.

3. Monitor will verify that, if nesting special-status raptors are found during a preconstruction survey, the biologist will identify and establish a buffer area around each active raptor nest. Monitor will verify that no construction activities will take place inside the buffer area until the young have fledged or the parents are no longer attempting to nest.

## Land Use and Planning

### **Impact LU-3—Creation of construction impacts, such as traffic and circulation obstructions, noise, dust, and other pollutants, and safety issues.**

**Mitigation Measure LU-3—Limit construction-related effects on land uses adjacent to the project alignment in Fremont Central Park.** The following measures will be utilized to limit short-term construction impacts related to the loss of parking associated with the softball/baseball fields at Fremont Central Park and the temporary disruption of walking paths around Lake Elizabeth. Implementation of these measures will be coordinated as necessary under a comprehensive agreement with the City of Fremont.

1. A dog-run facility will be provided.
2. A temporary pedestrian bridge will be constructed over the cut-and-cover subway construction just north of Lake Elizabeth.
3. Access across the BART construction zone between the parking lots for the softball fields will be provided whenever games are scheduled.
4. A public pathway across the construction zone from the neighborhood to the east will be maintained during construction whenever feasible.
5. Mitigation measures applicable to Fremont Central Park are noted in other sections of this document to reduce impacts on the park.
6. To the extent that the existing park paths may currently be capable of accommodating bicycles, the relocated paths will provide equivalent access. The paths will be well signed, and any paths closed for public safety and security will be well marked. At least one public pathway across the construction zone near Lake Elizabeth will be maintained at all times to accommodate people who walk or ride bicycles to the park from the residential areas immediately east of the railroad corridor.
7. BART and the construction contractor will work with the City of Fremont and ACFCDD to develop and put into practice a program to maintain Lake Elizabeth's flood control function or provide alternative temporary storage, if necessary, during the construction period.
8. BART and the construction contractor will work with the City of Fremont to find the most suitable locations and durations for construction storage.
9. Please see also Mitigation Measure TRN-25—Develop and implement a construction phasing and traffic management plan.
10. BART and its contractor will coordinate with the City Parks and Recreation staff to provide as much advance notice as possible for construction scheduling and other project activities that would cause disruptions to the use of the park.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require the contractor to limit land use impacts in Fremont Central Park, as described above.
2. BART staff will ensure and Monitor will verify that temporary walking/biking paths around Lake Elizabeth are created and maintained throughout the construction period.
3. BART staff will ensure and Monitor will verify that BART and the contractor will work with ACFCD to develop and implement a program to maintain Lake Elizabeth's flood control function or provide alternative temporary storage during the construction period.
4. BART staff will ensure that the contractor is working with the City of Fremont to find the most suitable locations and durations for construction storage.

## Parks and Recreation

### **Impact PR-1—Occurrence or acceleration of substantial deterioration of park and recreational facilities or programs.**

**Mitigation Measure A-3: Implement measures to conceal the ventilation structures.** This measure is described under Aesthetics.

**Mitigation Measure N-1—Implement noise-reducing measures at noise-sensitive land uses in the WSX Alternative corridor.** This measure is described under Noise and Vibration.

**Mitigation Measure N-3—Design and construct electrical substations, vent shafts, and other ancillary facilities to minimize noise.** This measure is described under Noise and Vibration.

#### **Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications include requirements to incorporate architectural and landscaping design and aesthetic treatments.
2. BART staff will ensure and Monitor will verify that the City of Fremont has been consulted in developing design criteria and that the final design is consistent with visual resources in the project vicinity.
3. Monitor will verify in the field that all architectural and landscaping design and aesthetic mitigation measures are implemented, as described above.
4. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require that the contractor implement measures described above to reduce operational noise.
5. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require that the contractor reduce facility noise to or below the BART design criteria.
6. Monitor will verify in the field that the contractor is implementing the design features to reduce operational and facility noise according to the plans and specifications.

### **Impact PR-3—Construction-related disruptions to park and recreation facilities or programs.**

**Mitigation Measure PR-3—Limit construction-related disruptions to Fremont Central Park.** Implementation of the following measures will be coordinated as necessary under a comprehensive agreement with the City of Fremont:

1. A relocated dog park will be provided.



2. A temporary pedestrian bridge will be constructed over the cut-and-cover subway construction just north of Lake Elizabeth.
3. Access across the construction zone between the parking lots for the softball fields will be provided whenever games are scheduled.
4. A public pathway across the construction zone from the neighborhood to the east will be maintained during construction whenever feasible.
5. To the extent that existing park paths may currently be capable of accommodating bicycles, the relocated paths will provide equivalent access. The paths will be well signed, and any paths closed for public safety and security will be well marked. At least one public pathway across the construction zone near Lake Elizabeth will be maintained at all times to accommodate people who walk or ride bicycles to the park from the residential areas immediately east of the railroad corridor.
6. BART and the construction contractor will work with the City of Fremont and ACFCO to develop and implement a program to maintain Lake Elizabeth's flood control function or provide alternative temporary storage, if necessary, during the construction period.
7. BART and the construction contractor will work with the City of Fremont to find the most suitable locations and durations for construction storage.
8. BART and its contractor will coordinate with the City Parks and Recreation staff to provide as much advance notice as possible for construction scheduling and other project activities that would cause disruptions to the use of Central Park.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require the contractor to limit land use impacts in Fremont Central Park, as described above.
2. BART staff will ensure and Monitor will verify that temporary walking/biking paths around Lake Elizabeth are created and maintained throughout the construction period.
3. BART staff will ensure and Monitor will verify that BART and the contractor will work with ACFCO to develop and implement a program to maintain Lake Elizabeth's flood control function or provide alternative temporary storage during the construction period.
4. BART staff will ensure that the contractor is working with the City of Fremont to find the most suitable locations and durations for construction storage.

## Population, Employment, and Housing

### Impact POP-3—Displacement of existing businesses or housing, especially affordable housing.

#### Mitigation Measure POP-3—Acquire property and relocate residences and businesses.

BART's Real Estate Services Department will institute an acquisition and relocation program that meets the requirements of applicable state and federal acquisition and relocation laws.

Acquisition will involve compensation at fair market value for properties, and relocation assistance will include, but is not limited to, down payments or rental supplements, moving costs, business reestablishment reimbursement, and goodwill offers, as appropriate. All benefits will be provided in accordance with the Federal Uniform Relocation and Real Properties Acquisition Policies Act and applicable state law.

#### Monitoring:

1. BART staff will ensure that the acquisition and relocation program is implemented prior to commencement of the project.
2. BART Real Estate Services Department will acquire the property, relocate affected business owners, and/or tenants in accordance with applicable federal and state laws and regulations. Acquisition and relocation activities will be audited as required by FTA and Caltrans.
3. Monitor will verify directly or through auditors that all applicable laws and regulations were followed for all relocations.

### Impact POP-7—Substantial diminishment in access to and parking at businesses and residences.

**Mitigation Measure POP-7—Maintain access, traffic control, and parking supply during construction.** BART will develop and implement a traffic and access control plan in consultation with the City of Fremont, local business associations, and local neighborhood and homeowners' associations. Before construction begins, BART and its contractors will verify that the traffic and access control plan avoids restriction of access and that flaggers are used to direct traffic in potentially congested zones such as the Washington Boulevard and Osgood Road area. Construction workers and contractors will be advised to carpool and park onsite when feasible to reduce temporary impacts on parking for adjacent residences and businesses. Movement of heavy equipment and supplies to and from construction sites will be scheduled during non-peak travel times. Similarly, temporary lane closures due to work on aerial or below-grade structures will be scheduled for non-peak travel times. Access to businesses and residences will be maintained throughout construction phases, and existing parking supply will not be reduced.

#### Monitoring:

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other

plans and specifications require the contractor to develop and implement a traffic control plan in consultation with the City of Fremont, as described above.

2. BART staff will ensure consultation with the City of Fremont and Monitor will verify implementation of traffic control measures in the field.

**Impact POP-10—Displacement of existing businesses or housing as a result of the optional Irvington Station, especially affordable housing.**

**Mitigation Measure POP-3—Acquire property and relocate residences and businesses.**

This measure has been described above.

**Monitoring:**

1. BART staff will ensure that the acquisition and relocation program is implemented prior to commencement of the project.
2. BART Real Estate Services Department will acquire the property, relocate affected business owners, and/or tenants in accordance with applicable federal and state laws and regulations. Acquisition and relocation activities will be audited as required by FTA and Caltrans.
3. Monitor will verify directly or through auditors that all applicable laws and regulations were followed for all relocations.

**Impact POP-12—Disruption or division of the physical arrangement of an existing community in the vicinity of the Irvington Station site such that social interaction within the community is severely hampered.**

**Mitigation Measure POP-7—Maintain access, traffic control, and parking supply during construction.** This measure has been described above.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require the contractor to develop and implement a traffic control plan in consultation with the City of Fremont, as described above.
2. BART staff will ensure consultation with the City of Fremont and Monitor will verify implementation of traffic control measures in the field.

**Impact POP-14—Substantial diminishment in access to and parking at businesses and residences near Irvington Station site.**

**Mitigation Measure POP-7—Maintain access, traffic control, and parking supply during construction.** This measure has been described above.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require the contractor to develop and implement a traffic control plan in consultation with the City of Fremont, as described above.
2. BART staff will ensure consultation with the City of Fremont and Monitor will verify implementation of traffic control measures in the field.

**Impact POP-Cume-2—Potential to restrict access and egress to existing businesses, residences, and community facilities or to reduce parking supply.**

**Mitigation Measure POP-Cume-2—Coordinate access and traffic control during construction of cumulative projects.**

1. BART will work with the City of Fremont and entities constructing other projects if necessary to ensure that the WSX Alternative's construction traffic management plan is adjusted to accommodate any overlapping construction traffic from multiple projects. BART will require its contractors to prepare a construction traffic management plan (as described in Mitigation Measure TRN-25) that designates truck and equipment access routes to the construction site. Contractors will be required to limit construction vehicle and equipment traffic to designated access routes. The construction traffic management plan will be coordinated with the contractor's construction sequence so that general timeframes when construction vehicles will use designated roadways within the WSX Alternative area (months from contractor's start of construction activities) can be estimated.
2. BART will approve the contractor's construction traffic management plan and submit a copy of the approved construction traffic management plan to the City of Fremont. The city can use the construction traffic management plan when reviewing building permit applications for development projects within the WSX Alternative area should the combined projects create the potential for construction traffic generated congestion to block access to existing development.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require the contractor's traffic control plan, as described above, to accommodate overlapping construction traffic from multiple projects in consultation with the City of Fremont.
2. BART staff will ensure consultation with the City of Fremont and Monitor will verify implementation of traffic control measures in the field.

**Impact POP-Cume-4—Potential for construction of the Irvington Station to restrict access and egress to existing businesses, residences, and community facilities or to reduce parking supply.**

**Mitigation Measure POP-Cume-2—Coordinate access and traffic control during construction of cumulative projects.** This measure has been described above.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require the contractor's traffic control plan, as described above, to accommodate overlapping construction traffic from multiple projects in consultation with the City of Fremont.
2. BART staff will ensure consultation with the City of Fremont and Monitor will verify implementation of traffic control measures in the field.

## Aesthetics

### **Impact A-1. Reconfiguration of Tule Pond, resulting in change of a well-defined landscape feature.**

**Mitigation Measure A-1—Protect and replace vegetation near Tule Pond.** BART will implement the following mitigation actions to minimize or rectify the impacts of vegetation removal and reconfiguration of portions of Tule Pond.

1. Minimize vegetation loss and replace vegetation lost during construction. Install measures to protect the portions of Tule Pond that will be preserved, as outlined in Section 4.6, *Wetlands*, of the FEIS.
2. Add plantings to screen views of the embankment south of Walnut Avenue. On completion of the project, BART's contractors will stabilize exposed slopes with hydro-seeding or other planting methods, and reestablish wetland banks with appropriate plantings to encourage the reestablishment of currently existing vegetation types.
3. Ensure that all landscaping plans are consistent with the existing vegetation of the area while serving sustainability goals. A qualified landscape architect retained by BART's contractors will approve all landscaping plans for the area.

#### **Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications include requirements to minimize vegetation loss, add plantings to screen views, and landscape plans are prepared by a qualified landscape architect.
2. Monitor will verify in the field that mitigation actions, as described above, are implemented.

### **Impact A-3. Potential adverse effects on visual quality and character of Fremont Central Park from proposed ventilation structures.**

**Mitigation Measure A-3: Implement measures to conceal the ventilation structures.** In designing and placing ventilation structures in Fremont Central Park, BART will implement the following mitigation measures.

1. Coordinate with the City of Fremont in developing criteria for design of the structures to be placed in the park. BART will ensure that the final designs of the structures and the plantings will be consistent with visual resources of the immediate project vicinity, including park maintenance facilities and landscaping.
2. Use surface treatments forms, textures, and colors that reflect Fremont's architectural character and that help blend the ventilation structures and ancillary equipment into the surroundings.

3. Establish plantings (e.g., trees and shrubs) along the edges of buildings and any fencing. The plantings will be consistent with the character of existing vegetation in the park.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications include requirements to incorporate architectural and landscaping design and aesthetic treatments.
2. BART staff will ensure and Monitor will verify that the City of Fremont has been consulted in developing design criteria and that the final design is consistent with visual resources in the project vicinity.
3. Monitor will verify in the field that all architectural and landscaping design and aesthetic mitigation measures are implemented, as described above.

**Impact A-4. Introduction of new elements associated with the proposed Warm Springs Station.**

**Mitigation Measure A-4: Ensure design of proposed Warm Springs Station is consistent with existing environment.** In developing detailed architectural and landscape plans for the proposed Warm Springs Station, BART will take the following steps.

1. Design the proposed Warm Springs Station so that it is compatible with the scale and massing of other buildings in the surrounding environment, including the commercial facilities to the north and the light industrial uses to the north and south.
2. Provide landscaping within the parking areas to visually interrupt the expanses of paving, provide shade, provide protected circulation areas for pedestrians, and minimize glare from parked automobiles.
3. Plant trees and plantings to function as wayfinding elements in conjunction with lighting.
4. Ensure all plantings are xeric/drought-tolerant and located to maximize the likelihood of sustainability (i.e., taking into account soil, drainage, sun/shadow).
5. Provide artificial lighting to accommodate pedestrians and bicyclists as well as vehicles, and install it in a manner that minimizes spillover light.
6. Consult with the City of Fremont regarding the design of the Warm Springs Station, including consideration of city comments developed through voluntary participation in informal design review meetings prior to finalization of the station plans.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications include all requirements to incorporate architectural, landscaping design, and aesthetic treatments.

2. BART staff will ensure and Monitor will verify that the City of Fremont has been consulted regarding the design of the Warm Springs Station as described above.
3. Monitor will verify in the field that all architectural, landscaping design, and aesthetic treatments are implemented.

**Impact A-5. Potential visual impacts due to soundwalls.**

**Preferred Mitigation Measure A-5(i)—Screen views of sound walls with landscaping.**

1. Where right-of-way widths allow, BART will provide xeric/drought-tolerant landscaping (e.g., trees, vines, and/or shrubs) to screen views of sound walls where visual impacts occur. Landscaping would generally reduce visual impacts associated with proposed sound walls. In certain cases, however, the resulting visual impacts may remain. If that is the case, the following alternative mitigation measure will be applied.
2. Alternative Mitigation Measure A-5(ii)—Provide surface treatments. If the right-of-way width is insufficient to permit landscaping or if the preferred mitigation measure described above cannot adequately reduce the visual impacts, an alternative mitigation measure will be implemented whereby the outside of the walls (residential side) will be designed with a surface treatment that is compatible with the surrounding residential architecture. In some cases where surface treatment is used rather than landscaping or where sound walls are placed on top of berms, resulting visual impacts may remain.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications include requirements to incorporate landscaping treatments to screen views of soundwalls. BART staff will evaluate whether alternative mitigation is needed to implement surface treatments.
2. Monitor will verify in the field that all landscaping design and surface treatments as necessary are implemented.

**Impact A-6—Temporary visual impacts caused by construction.**

**Mitigation Measure A-6—Take measures to conceal temporary construction activities.**

BART will implement the following mitigation measures to rectify, reduce, or minimize temporary visual impacts during construction.

1. Fencing will be installed to shield views of construction activities from Stevenson Boulevard, Fremont Central Park, Osgood Road, and Grimmer Boulevard. Fencing installed by BART contractors will be sufficiently tall to hide all excavation, grading, and trenching activities and materials.
2. Major construction activities will be followed immediately with paving and landscaping. Fencing materials will remain in place until finish work (e.g., plantings, site cleanup) has been completed.



**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require the contractor to shield construction activities from sensitive views and provide paving and landscaping, as described above.
2. BART staff will ensure and Monitor will verify that fencing is adequate to conceal views and major construction activities are followed immediately with paving and landscaping.
3. Monitor will verify these activities are implemented in the field.

**Impact A-7. Introduction of new elements or demolition of existing structures in area of optional Irvington Station.**

**Mitigation Measure A-7(a): Ensure design of an optional Irvington Station is consistent with existing environment.** In developing detailed architectural and landscape plans for the optional Irvington Station, BART will take the following steps.

1. Design the optional Irvington Station so that it is compatible with the scale and massing of other buildings in the surrounding environment.
2. Provide landscaping within the parking areas to visually interrupt the expanses of paving, provide shade, provide protected circulation areas for pedestrians, and minimize glare from parked automobiles.
3. Plant trees and plantings to function as wayfinding elements in conjunction with lighting.
4. Ensure all plantings are xeric/drought-tolerant and are located to maximize the likelihood of sustainability (i.e., taking into account soil, drainage, sun/shadow, etc. considerations).
5. Provide artificial lighting to accommodate pedestrians and bicyclists as well as vehicles, and install it in a manner that minimizes spillover light.
6. Consult with the City of Fremont regarding the design of the optional Irvington Station, including consideration of city comments developed through voluntary participation in informal design review meetings prior to finalization of the station plans.

**Mitigation Measure A-7(b): Incorporate Gallegos Winery site into design of optional Irvington Station.** In developing detailed architectural and landscape plans for the optional Irvington Station, BART will take the following mitigation measures.

1. BART will work with the City of Fremont to ensure that the final designs are consistent with the city's goals for preserving the Gallegos Winery ruins.
2. The design and layout of the parking lot area east of Osgood Road will be designed so as to avoid physical encroachment on the Gallegos Winery ruins.
3. BART will work with the City of Fremont to develop design guidelines to ensure the final landscaping/plantings design of the parking lot and near the Gallegos Winery ruins are consistent with the visual resources of the immediate project vicinity.

4. Artificial lighting will be installed in a manner that minimizes spillover light, using such design features as capping, shielding, and ground-level bollards.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications include design guideline requirements related to developing detailed architectural and landscape plans for the optional Irvington Station.
2. BART staff will ensure and Monitor will verify that the City of Fremont has been consulted regarding the design of the optional Irvington Station and the treatment of the Gallegos Winery ruins as described above.
3. Monitor will verify in the field that all architectural, landscaping design, and aesthetic treatments are implemented.

## Cultural Resources

### Impact CR-1(b)—Potential for vibration damage to William Y. Horner House.

**Mitigation Measure N-2: Implement vibration-reducing measures at vibration-sensitive land uses in the Project corridor.** This measure is described under Noise and Vibration.

**Mitigation Measure N-5: Employ vibration-reducing construction practices.** This measure is described under Noise and Vibration.

#### Monitoring:

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require that the contractor implement measures to reduce operational vibrations.
2. Monitor will verify in the field that the contractor is implementing the design features to reduce operational vibrations according to the plans and specifications.
3. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications include requirements for the contractor to use vibration-reducing construction methods, as described above.
4. Monitor will verify that vibration-reducing methods are used in the field and ground-borne vibration monitoring of vibration-intensive activities is consistent with the standards described above.

### Impact CR-2—Potential for ground-disturbing activities to result in substantial change in the significance of archaeological resources: site CA-ALA-343 and previously unknown or buried cultural deposits or human remains.

**Mitigation Measure CR-2(a)—Prepare and implement memorandum of agreement (MOA) and historical properties treatment plan (HPTP) for area of potential effects (APE).** BART will prepare and enter into an MOA with SHPO that assumes the presence of a significant archaeological site and potential adverse effects on resources, including human remains. The MOA will provide for subsurface testing and data recovery in a detailed treatment plan for the entire APE as needed prior to construction, as well as other measures to minimize and mitigate impacts. The treatment plan will include, but not be limited to the details described in Mitigation Measures CR-2(b), CR-2(c), and CR-2(d).

#### **Mitigation Measure CR-2(b)—Conduct geomorphological research and subsurface investigations, including backhoe trenching.**

1. Based on examinations of the project area, the entire APE, with the exception of filled areas,

is considered moderately to very highly sensitive for the potential for buried cultural resources. To locate buried sites within the project APE, the following procedures will be implemented. However, regardless of the sensitivity of the area, if the project will not result in subsurface disturbance in a particular location, no subsurface investigations will be required in that location. By undertaking the majority of the procedures described below prior to construction, monitoring and construction delays can be reduced.

2. The project segments (Segments 1–6, as identified in the FEIS) have been classified into three broad types of sensitivity: very high, high, and high to moderate. Each classification is reached by considering known sites, setting, and sediment type. This information is then compared against proposed construction impacts, with resource identification and treatment activities varying accordingly.
  - a) Very High Sensitivity (Segment 1): Because of the presence of a known site, impacts on Segment 1 (north end of APE to northern subway portal) will be addressed in an MOA and treatment plan. This entire portion of the APE will be subjected to some degree of subsurface archaeological testing prior to construction; such testing will be detailed in an MOA and treatment plan.
  - b) High Sensitivity (Segments 2, 3, 5, and 6): To test for buried cultural materials in areas with Holocene period alluvium where subsurface disturbance is proposed, backhoe trenches will be excavated in open areas on a regular grid at intervals of approximately 500 feet. The depth of trenches will be to the maximum reach of the machine or until groundwater level is reached. Soil descriptions and profiles will be drawn as needed. A geoarchaeologist will be present during this testing activity and will use their judgment to continue or limit backhoe testing within the Basin Sediments. The subway tunnel will be monitored for disturbance occurring as deep as approximately 15 feet, because preconstruction excavation would not be possible.
  - c) High to Moderate Sensitivity (Segment 4): Pleistocene and Undifferentiated Alluvium in this segments will be tested using backhoe trenches at intervals of approximately 650 feet, in open areas as available, and only where subsurface disturbance is proposed. These trenches will be excavated below the proposed depth of construction, which in the at-grade areas may be fairly shallow. Based on the results of this effort and sediment conditions, the geoarchaeologist may recommend a closer trenching interval within the Pleistocene and Undifferentiated Alluvium.

**Mitigation Measure CR-2(c)—Conduct subsurface testing, data recovery, and reporting for CA-ALA-343.**

1. SHPO has concurred that CA-ALA-343 is an NRHP-eligible (National Register of Historic Places) resource that will be adversely affected by the WSX Alternative. BART will conduct subsurface testing to assess and minimize potential effects on prehistoric and historic archaeological resources at CA-ALA-343 and vicinity. To establish the presence or absence and the integrity of CA-ALA-343 deposits in the project area, BART will design a focused subsurface testing program and implement it in areas south of Tule Pond and north of Stevenson Boulevard that have not previously been subject to subsurface archaeological

investigations. To do this, BART will retain qualified archaeologists to conduct the investigation, which will follow standard professional practice for the evaluation of cultural resources. Before the investigation begins, a work plan will be prepared, including Native American protocols for the project, a research design, and methods of conducting the study.

2. Following test excavations, a technical report will be prepared to document the results of the investigation. The technical report will be submitted to BART and also placed on file at the Northwest Information Center of the California Historical Resources Information System at Sonoma State University. If archaeological deposits are discovered, the report will define the WSX Alternative's expected effects and present specific recommendations for subsequent actions. Consideration will be given to preserving important archaeological deposits in the project area by avoiding the deposits or otherwise protecting them from impacts, if feasible.
3. If preservation alternatives are not possible or feasible, BART will conduct data recovery for CA-ALA-343 and vicinity in order to minimize impacts. If significant archaeological deposits that cannot be avoided or otherwise protected are found within the WSX Alternative area, BART will ensure that data recovery is implemented by qualified archaeologists in accordance with standard professional practices. If archaeological deposits that indicate the presence or probable likelihood of Native American human remains are discovered, the data recovery plan will be prepared and implemented in consultation with appropriate representatives of the Native American community. The objective of archaeological data recovery will be to adequately recover the scientifically consequential information from and about the historical resource. The results of the study will be deposited with the California Historical Resources Regional Information Center.

**Mitigation Measure CR-2(d)—Stop work if buried cultural deposits are encountered during construction activities.**

1. If buried cultural resources such as chipped or ground stone, quantities of bone or shell material, or historic debris or building foundations are inadvertently discovered during ground-disturbing activities, work will be stopped within a 100-foot radius of the find until a qualified archaeologist can assess the significance of the find. If, after evaluation by a qualified archaeologist, an archaeological site or other find is identified as meeting the criteria for inclusion in the NRHP or the California Register of Historic Resources (CRHR), BART will retain a qualified archaeologist to develop and implement an adequate program for investigation, avoidance if feasible, and data recovery for the site, with Native American consultation, if appropriate.<sup>7</sup>
2. If human skeletal remains are inadvertently encountered during construction of the WSX Alternative, the contractor will contact the Alameda County Coroner immediately. If the County Coroner determines that the remains are Native American, the coroner will contact the Native American Heritage Center (NAHC), as required by Section 7050.5[c] of the California Health and Safety Code, and the County Coordinator of Indian Affairs. A qualified archaeologist will also be contacted immediately.

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<sup>7</sup> This portion of Mitigation Measures CR-2 applies to the WSX Alternative area where construction is not anticipated to encounter archaeological remains and will therefore not be monitored or previously investigated by qualified archaeologists.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that subsurface investigations for archaeological resources are conducted as outlined in the Historic Properties Treatment Plan (HPTP) for the project.
2. If subsurface resources are discovered, BART staff will ensure and Monitor will verify that data recovery and reporting has occurred as required in the HPTP.
3. If any archaeological remains are discovered during construction activities, BART staff will enforce the requirement for ceasing work in the vicinity pending an evaluation of the nature and significance of the materials found.
4. BART staff will ensure and Monitor will verify that, if an archeological site is identified, BART will retain a qualified archeologist to develop and implement a program for investigation and avoidance, if feasible.
5. Monitor will verify in the field that the requirements of the plan are being implemented.
6. BART staff will contact the Alameda County Coroner, if skeletal remains are found.
7. If the optional Irvington Station is constructed, the following mitigation measures (CR-5 and CR-6) would be implemented.

**Impact CR-5—Potential impact on structural remains of Gallegos Winery and associated features.**

**Mitigation Measure CR-5—Preserve and interpret structural remains of Gallegos Winery and associated features.** BART will not disturb the structural remains of the winery and retain as many of the historic palm trees as feasible. This way the site can be incorporated into the proposed optional Irvington Station walkway and parking lot. An appropriate barrier or fencing will be placed between the proposed walkway/parking lot and the structural remains so that the site is protected and also visible to the public. BART will also display an interpretive plaque or signage explaining the history and significance of the site nearby the winery ruins. The objective of this interpretive tool would be to increase local and regional public awareness of this historic site, as well as an awareness of BART's efforts to maintain the structural remains while preserving its essential historic character.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that designs for the optional Irvington Station preserve the remains of the Gallegos Winery ruins, with appropriate barriers and signage.
2. Monitor will verify in the field that the requirements of the station plan are being implemented.

**Impact CR-6—Potential impact on a significant architectural resource: Ford House.**

**Mitigation Measure CR-6(a)—Document the Ford House.** BART will hire a qualified cultural resources management specialist to document the Ford House with a historical narrative and large-format photographs in a manner consistent with the Historic American Buildings Survey (HABS). Copies of the narrative and photographs would be distributed to branches of the Alameda County Library system, Alameda County Historical Society, and the Washington Township Historical Society. The preparation of the HABS documentation will follow standard National Park Service procedures. There will be three main tasks: gather data, prepare photographic documentation, and prepare written historic and descriptive reports. The photographic documentation will consist of large-format photography conforming to HABS standards. Photographic documentation will include 4- by 5-inch negatives in labeled sleeves, 8- by 10-inch prints mounted on labeled photo cards, and an index to the photographs. In addition to the residence and its setting, the research will include possible photographic reproduction of any available building blueprints.

**Mitigation Measure CR-6(b)—Adapt Ford House for reuse.**

1. BART will retain the Ford House (41753 Osgood Road) and adjoining mature landscape for reuse as part of the proposed Optional Irvington Station
2. Prior to the rehabilitation or reuse of any portion of the Ford House and associated landscape features, a qualified cultural resource management specialist will prepare a Historic Structures Report following Office of Historic Preservation guidelines. The report shall document the construction history of the Ford House property; identify the character-defining features of the residence (i.e., the form and detailing of exterior building materials), and record the existing appearance and condition of the building.
3. Based on information from the Historic Structures Report, BART will rehabilitate the Ford House and will explore adaptive reuse options (i.e., office, commercial establishment) for the building according to guidelines established in the *Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings*. As part of the reuse efforts, BART will take steps to retain the building's architectural significance (i.e., historic appearance) despite any planned alterations or additions necessary for contemporary use. Physical changes to the Ford House shall not result in the loss of the building's historic character or integrity.
4. Prior to the rehabilitation or reuse of any portion of the Ford House, a qualified cultural resource management specialist will also prepare a preservation and maintenance plan for the Ford House that is compatible with *The Secretary of the Interior's Standards for Treatment of Historic Properties*.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that a qualified cultural resources specialist documents the Ford House and distribution of information is completed.

2. BART staff will ensure and Monitor will verify that designs for reuse of the Ford House are consistent with *The Secretary of the Interior's Standards for Treatment of Historic Properties*.
3. Monitor will verify in the field that the requirements of the Ford House reuse plan are being implemented.

**Impact CR-Cume-2—Potential Damage to William Y. Horner House.**

**Mitigation Measure N-2—Implement vibration-reducing measures at vibration-sensitive land uses in the WSX Alternative corridor.** This measure is described under Noise and Vibration.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require that the contractor implement measures to reduce operational vibrations, as described above.
2. Monitor will verify in the field that the contractor is implementing the design features to reduce operational vibrations according to the plans and specifications.



## Noise and Vibration<sup>8</sup>

### Impact N-1. Exposure of noise-sensitive land uses to noise from BART trains in the Project corridor.

**Mitigation Measure N-1: Implement noise-reducing measures at noise-sensitive land uses in the Project corridor.** BART will design and implement noise-reducing measures such that noise from train operations does not exceed the operational noise limits listed in Table 3.10-3. The measures may include but are not limited to the following.

1. Noise Barriers – Construction of barriers is a common approach to reducing noise impacts from surface transportation sources. The primary requirements for an effective noise barrier are that (1) the barrier must be high enough and long enough to break the line-of-sight between the sound source and the receiver; (2) the barrier must be of an impervious material with a minimum surface density of 4 lb/sq. ft.; and (3) the barrier must not have any gaps or holes between the panels or at the bottom. Because numerous materials meet these requirements, the selection of materials for noise barriers is usually dictated by aesthetics, durability, cost, and maintenance considerations. Depending on the proximity of the barrier to the tracks and on the track elevation, transit system noise barriers typically range in height from between 4 and 8 feet. Where implementation of all feasible exterior noise mitigation does not reduce noise below the thresholds identified in Tables 3.10-3 and 3.10-4 in the DSEIR (attached), implementation of interior noise-mitigation measures to reduce interior noise to less than 45 dB-Ldn is considered adequate to mitigate noise impacts to a less than significant level.
2. Building Sound Insulation – Sound insulation of residences and institutional buildings to improve the outdoor-to-indoor noise reduction has been widely applied around airports and has seen limited application for transit projects. Although this approach has no effect on noise in exterior areas, it may be the best choice for sites where noise barriers are not feasible or desirable, and for buildings where indoor sensitivity is of greatest concern. Substantial improvements in building sound insulation (on the order of 5 to 10 dBA) can often be achieved by adding an extra layer of glazing to the windows, by sealing any holes in exterior surfaces that act as sound leaks, and by providing forced ventilation and air-conditioning so that windows do not need to be opened.

Where implementation of all feasible exterior noise mitigation does not reduce noise below the thresholds identified in Tables 3.10-3 and 3.10-4 in the DSEIR, implementation of interior noise-mitigation measures to reduce interior noise to less than 45 dB-Ldn is considered adequate to mitigate noise impacts to a less than significant level.

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<sup>8</sup>For the area of noise and vibration, except where noted, the 2003 SEIR mitigation measures are used, because they were based on BART criteria that are considered more stringent than the FTA criteria used in the 2006 EIS.

3. Special Trackwork at Crossovers – Because the impacts of wheels over rail gaps at track crossover locations increase noise by about 6 dBA, crossovers in sensitive areas are a major source of noise impact. The first option for mitigation is to relocate the crossovers. BART Facility Standards do not allow the use of spring rail or moving point frogs. Per Standard, all mainline frogs shall be rail-bound manganese type in accordance with American Railway Engineering and Maintenance-of-Way Association (AREMA) Portfolio Plan No. 621.<sup>9</sup>

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require that the contractor implement measures described above to reduce operational noise.
2. Monitor will verify in the field that the contractor is implementing the design features to reduce operational noise according to the plans and specifications.

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<sup>9</sup> In this instance, the 2006 EIS mitigation measure is used, reflecting changes in BART Facility Standards since the 2003 SEIR.

**Table 3.10-3.** BART Design Criteria for Operational Noise from BART Trains

BART Area Category*	Maximum Passby Noise Level (dBA)		
	Single-Family Dwellings	Multi-Family Dwellings	Commercial Buildings
I <u>Low Density Residential</u> : urban residential, open space park, suburban residential or quiet recreation area. No nearby highways or boulevards	70	75	80
II <u>Average Residential</u> : urban residential, quiet apartments and hotels, open space, suburban residential, or occupied outdoor areas near busy streets	75	75	80
III <u>High Density Residential</u> : urban residential, average semi-residential/commercial areas, parks, museum, and non-commercial public building areas	75	80	85
IV <u>Commercial</u> : areas with office buildings, retail stores, etc., primarily daytime occupancy. Central Business Districts	80	80	85
V <u>Industrial/Highway</u> : areas or Freeway and Highway Corridors.	80	85	85
<i>Special Receptors</i>			
“Quiet” Outdoor Recreation Areas		70	
Concert Halls, Radio and TV Studios		70	
Churches, Theaters, Schools, Hospitals		75	
Note:			
* Residential land uses are described in additional detail in Section 3.4 ( <i>Land Use and Planning</i> ).			
Source: San Francisco Bay Area Rapid Transit District 1992			

**Table 3.10-4.** BART Design Criteria for Operational Noise from Ancillary Facilities

BART Area Category*	Maximum Noise Level (dBA)	
	Transient	Continuous
I <u>Low Density Residential</u> : urban residential, open space park, suburban residential or quiet recreation area. No nearby highways or boulevards	50	40
II <u>Average Residential</u> : urban residential, quiet apartments and hotels, open space, suburban residential, or occupied outdoor areas near busy streets	55	45
III <u>High Density Residential</u> : urban residential, average semi-residential/commercial areas, parks, museum, and non-commercial public building areas	60	50
IV <u>Commercial</u> : areas with office buildings, retail stores, etc., primarily daytime occupancy. Central Business Districts	65	55
V <u>Industrial/Highway</u> : areas or Freeway and Highway Corridors.	70	65

## Notes:

Criteria are reduced by 5 dBA for noises with pure tones.

\* Residential land uses are described in additional detail in Section 3.4 (*Land Use and Planning*).

Source: San Francisco Bay Area Rapid Transit District 1992

**Impact N-2, Exposure of vibration-sensitive land uses to groundborne vibration from BART trains.**

**Mitigation Measure N-2: Implement vibration-reducing measures at vibration-sensitive land uses in the Project corridor.** BART will design and implement vibration-reducing measures such that groundborne vibration from train operations does not exceed the operational vibration limits listed in Table 3.10-6 of the SEIR. The measures may include but are not limited to the following.

1. Ballast Mats – Rail trackways consist of ballast and ties. Ballast is the aggregate rock material that lies between the crosspieces of wood or concrete that support the rails. A ballast mat consists of a pad made of rubber or rubber-like material placed on an asphalt or concrete base with the normal ballast, ties, and rail above. The reduction in ground-borne vibration provided by a ballast mat depends strongly on the frequency content of the vibration and on the design and support of the mat. Ballast mats will only work in locations where there is ballast and tie track.
2. Resilient Fasteners and/or Resiliently Supported Ties – A number of resilient fastening systems for reducing vibration are available. However, many resilient fasteners are suitable for direct fixation only and would not work for ballast and tie track. Resilient fasteners reduce the amount of vibration energy that is transferred into the track substructure and are effective in reducing ground-borne vibration in frequencies above 30 Hz.
3. Special Trackwork at Crossovers – Because the impacts of wheels over rail gaps at track crossover locations increases vibration by about 10 dBA, crossovers are a major source of vibration impact when they are located in sensitive areas. BART Facility Standards do not allow the use of spring rail or moving point (swing nose) frogs. Per Standard, all mainline frogs shall be rail-bound manganese type in accordance with AREMA Portfolio Plan No. 621.<sup>10</sup>

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require that the contractor implement measures to reduce operational vibrations, as described above.
2. Monitor will verify in the field that the contractor is implementing the design features to reduce operational vibrations according to the plans and specifications.

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<sup>10</sup> In this instance, the 2006 EIS mitigation measure is used, reflecting changes in BART Facility Standards since the 2003 SEIR.

**Table 3.10-6.** BART Design Criteria for Operational Groundborne Vibration

BART Area Category	Ground-Borne Vibration Maximum Passby Velocity Levels (VdB, $\mu\text{in}/\text{sec}$ )		
	Single Family Dwellings	Multi Family Dwellings	Commercial Buildings
I Low Density Residential	70	70	70
II Average Residential	70	70	75
III High Density Residential	70	75	75
IV Commercial	70	75	75
V Industrial/Highway	75	75	75
	Maximum Passby Levels ( VdB, $\mu\text{in}/\text{sec}$ )		
Concert Halls and TV Studios		65	
Churches and Theaters		70-75	
Hospital Sleeping Rooms		70-75	
Courtrooms, Schools, Libraries		75	
Offices		75-80	
Commercial and Industrial Buildings		75-85	
Vibration-Sensitive Industry or Research		60-70	

Source: San Francisco Bay Area Rapid Transit District 1992, *Extensions Program System Design Criteria*

**Impact N-3. Exposure of noise-sensitive land uses to noise from ancillary equipment.**

**Mitigation Measure N-3: Design and construct electrical substations, vent shafts, and other ancillary facilities to reduce noise.** Electrical substations, emergency generators, vent shafts, and other ancillary facilities to reduce noise will be designed so that noise generated by these facilities does not exceed limits specified in Table 3.10-4 in the SEIR. Measures to be employed may include but are not limited to the following.

1. Orient noise-generating components away from noise-sensitive land uses or locating buildings between noise-generating components and noise-sensitive land uses.
2. Use acoustically rated vents to reduce noise.
3. Construct local barriers or enclosures around noise-generating components.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require that the contractor reduce facility noise to or below the BART design criteria.
2. Monitor will verify in the field that the contractor is implementing the design features to reduce facility noise according to the plans and specifications.

**Impact N-4. Exposure of noise-sensitive land uses to construction noise.**

**Mitigation Measure N-4(a): Employ noise-reducing construction practices.** The construction contractor will employ noise-reducing construction practices such that construction noise does not exceed the limits specified in Table 3.10-5 at occupied land uses. Measures to be employed may include but are not limited to the following.

1. Avoid nighttime construction in residential areas.
2. Use equipment with enclosed engines and/or high performance mufflers.
3. Locate stationary equipment as far as possible from noise-sensitive uses.
4. Construct noise barriers, such as temporary walls or piles of excavated material between noise activities and noise sensitive uses.
5. Re-route construction-related traffic along roads that will result in the least amount of disturbance to residences.
6. Where pile driving is planned within 1,200 feet of residences, or within 650 feet of hotels or in-use outdoor recreation areas, use cast-in-drilled-hole (CIDH) piles, pre-drilled piles, soil-mix wall technology, shielded pile drivers, vibratory pile drivers. (Shielded pile drivers or vibratory pile drivers can be used only where geotechnical conditions allow.)

**Mitigation Measure N-4(b): Disseminate essential information to residences and implement a complaint response/tracking program.** BART will notify residences within 500 feet of a construction area of the construction schedule in writing, prior to construction. BART and the construction contractor will designate a noise-disturbance coordinator who will be responsible for responding to complaints regarding construction noise. The coordinator will determine the cause of the complaint and will ensure that reasonable measures are implemented to correct the problem. A contact telephone number for the noise disturbance coordinator will be conspicuously posted on construction site fences and will be included in the written notification of the construction schedule sent to nearby residents.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications include requirements to use noise-reducing construction practices, as described above.
2. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications include requirements for the use of noise barriers or alternative technologies to pile-driving that produce less noise, as listed above, as necessary to meet BART's construction noise thresholds in the vicinity of sensitive receptors.
3. Monitor will verify in the field that noise-reduction measures, such as temporary noise barriers, are used to reduce noise, that sound barriers or alternative technologies that produce less noise are provided during construction as necessary to reduce noise near sensitive receptors, and that BART's construction noise criteria are met.
4. BART staff will ensure that a noise coordinator is named and that residents within 500 feet of a construction area are notified, and Monitor will verify that noise coordinator is responding to complaints.

**Impact N-5. Exposure of vibration-sensitive land uses to construction vibration.**

**Mitigation Measure N-5: Employ vibration-reducing construction practices.** The construction contractor will employ vibration-reducing construction practices such that construction vibration does not exceed 80 VdB (more than 1 hour per day), 90 VdB (less than 1 hour per day), or 100 VdB (less than 10 minutes per day), or a peak particle velocity damage threshold of 0.20 inches per second for fragile buildings or structures. The Horner House at 3101 Driscoll Road is the only historic structure in close proximity to the project area that is potentially in the fragile category. Measures to be employed may include but are not limited to the following.

1. Locate vibration-generating equipment as far as possible from vibration-sensitive land uses.
2. Avoid simultaneous operation of multiple pieces of vibration-generating equipment.
3. Avoid nighttime construction in residential areas.



4. Avoid construction processes that generate high vibration levels (for example vibration from pile driving can be reduced or eliminated by using pre-drilled holes or using pushed piles).
5. Avoid the use of vibratory rollers near vibration-sensitive uses.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications include requirements for the contractor to use vibration-reducing construction methods, as described above.
2. Monitor will verify that vibration-reducing methods are used in the field and ground-borne vibration monitoring of vibration-intensive activities is consistent with the standards described above.

## Air Quality

### Impact AQ-6—Generation of emissions during project construction.

**Mitigation Measure AQ-1—Comply with BAAQMD feasible control measures for construction emissions of PM10.** To control the generation of construction-related PM10 emissions, BAAQMD feasible control measures for construction emissions of PM10, as summarized below, will be complied with.<sup>11</sup>

1. Basic Control Measures – The following controls should be implemented at all construction sites.
  - a) Water all active construction areas at least twice daily, or more as required to control dust.
  - b) Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard.
  - c) Pave, apply water three times daily, or apply (nontoxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.
  - d) Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at construction sites, or more as needed.
  - e) Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets, or more as needed.
  - f) Reduce idling of internal combustion engines to an absolute minimum to the greatest extent possible.
  - g) Maintain construction equipment properly and tune engines to minimize exhaust emissions.
2. Enhanced Control Measures – The following measures should be implemented at construction sites greater than 4 acres in area.
  - a) Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more).
  - b) Enclose, cover, water twice daily, or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.).
  - c) Limit traffic speeds on unpaved roads to 15 mph.

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<sup>11</sup> This mitigation measure retains BAAQMD control measures that were included in the 2003 SEIR mitigation measure, making it more stringent than the 2006 EIS mitigation measure.

- d) Install sandbags or other erosion control measures to prevent silt runoff to public roadways.
  - e) Replant vegetation in disturbed areas as quickly as possible.
3. Optional Control Measures – The following control measures are strongly encouraged at large construction sites located near sensitive receptors or sites that may warrant additional emissions reductions for any other reason.
- a) Install wheel washers for all exiting trucks, or wash off the tires or tracks of all trucks and equipment leaving the site.
  - b) Install wind breaks, or plant trees/vegetative wind breaks at windward side(s) of construction areas.
  - c) Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph.
  - d) Limit the area subject to excavation, grading, and other construction activity at any one time.

**Mitigation Measure AQ-2—Provide a construction emissions plan for diesel particulate matter.** BART’s contractor will design a construction emissions mitigation plan (“CEMP”) to incorporate specific conditions that reduce diesel particulate matter during project construction. The conditions shall include, but are not limited to the following measures; that equipment: a) not idle for more than ten minutes, b) not be tampered with in order to increase engine horsepower, c) include particulate traps, oxidation catalysts and other suitable control devices on all construction equipment used at the construction site or shall use ultra low sulfur diesel fuel (“ULSD”) with a sulfur content of 15 ppm or less or other suitable alternative diesel fuel, unless the fuel cannot be reasonably procured in the geographic area, and d) be tuned to the engine manufacturer's specifications in accordance with a defined maintenance schedule. (Suitability of control devices or fuel is based on a number of factors including the following: reduced availability of the construction equipment due to increased downtime and/or power output, potential for significant damage to equipment engines, and any significant risk to nearby workers or the public.) The CEMP shall also establish work limitations such as minimizing trips, establishing truck routes, and providing staging areas for trucks located away from sensitive receptors, etc. BART or BART’s contractor will include a cost analysis in the Draft CEMP with respect to the sensitive receptors in the area, location of supplies, and availability of construction easements near the project. BART’s contractor will work with the City of Fremont to develop an approved truck routing plan, which will be included in the Final CEMP. BART will report on the progress of this mitigation.

#### **Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications incorporate the above requirements and require that the contractor use applicable Bay Area Air Quality Management District (BAAQMD) BMPs for construction activities to minimize air emissions, as described above.

2. Monitor will verify in the field that the BART contractor is implementing BMPs to minimize air emission according to the plans and specifications.
3. BART staff will ensure and Monitor will verify that bid documents and contracts require a construction emissions mitigation plan (CEMP) and Monitor in the field that the plan has been implemented.

## Energy

**Impact E-4.** Effects of construction on the consumption of nonrenewable energy resources.

**Mitigation Measure E-4: Develop and implement construction energy conservation plan.**

BART will require the contractors to adopt construction energy conservation measures including, but not limited to, those listed below.

1. Use energy-efficient equipment and incorporate energy-saving techniques in the construction of the Project.
2. Avoid unnecessary idling of construction equipment.
3. Consolidate material delivery as much as possible to ensure efficient vehicle utilization.
4. Schedule delivery of materials during non-rush hours to maximize vehicle fuel efficiency.
5. Encourage construction workers to carpool.
6. Maintain equipment and machinery, especially those using gasoline and diesel, in good working condition.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require the contractor to develop and implement construction energy conservation measures, as described above.
2. Monitor will verify in the field that the contractor is implementing the construction energy conservation measures according to the plans and specifications.

**Impact E-8.** Effects of construction of optional Irvington Station on the consumption of nonrenewable energy resources.

**Mitigation Measure E-4: Develop and implement construction energy conservation plan.**

This measure is described above.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that bid documents and contracts, and other plans and specifications require the contractor to develop and implement construction energy conservation measures, as described above.
2. Monitor will verify in the field that the contractor is implementing the construction energy conservation measures according to the plans and specifications.

## Utilities and Public Services

### **Impact UPS-1—Potential conflicts with Hetch Hetchy water pipelines and electrical transmission lines, and ACWD water lines.**

#### **Mitigation Measure UPS-1—Coordinate with the San Francisco Public Utilities Commission staff and Alameda County Water District (ACWD) staff.**

1. Impacts on the Hetch Hetchy water system and ACWD water system will be minimized by consulting the respective staff early in the engineering design process to coordinate key elements of the design, such as locations of structural columns, at-grade track ballast, subway structure, or similar structures, so as to maintain proper clearance and minimize potential effects on the pipelines.
2. BART will coordinate with the San Francisco Public Utilities Commission (SFPUC) and ACWD during project design to minimize constraints and operational impacts related to the Hetch Hetchy pipelines. During construction, access would be provided for emergency purposes and maintenance repairs.

**Mitigation Measure UPS-2—Provide protection from stray electrical currents.** As a precautionary measure to safeguard against stray electrical currents related to BART operation, running rails will be insulated from ground at all potential areas of effect. This insulation will prevent stray currents from leaving the running rail and returning to it, ensuring that BART operations do not interfere with the cathodic protection installed on the pipes. BART will also monitor the system for significant stray currents. BART will coordinate with potentially affected utility agencies to identify any additional measures that may be required to protect facilities from stray electrical current.

**Mitigation Measure UPS-3—Proper clearance from Hetch Hetchy electrical transmission lines will be maintained.** With regard to the Hetch Hetchy overhead power lines, the reconstruction of existing support towers or placement of new ones may prove necessary to meet minimum clearance requirements. Proper clearance from electrical transmission lines will be maintained.

#### **Monitoring:**

1. BART staff will ensure that coordination with San Francisco Water Department and the ACWD staff has occurred.
2. BART staff will review appropriate contract documentation to verify protection from stray electrical currents and proper clearance from electrical transmission lines.

**Impact UPS-2—Potential disruptions of utilities, electrical transmission lines, pipelines, and fiber optic cables related to the operation of the WSX Alternative.**

**Mitigation Measure UPS-1—Coordinate with the San Francisco Public Utilities Commission and ACWD staff.** This mitigation measure is described above.

**Mitigation Measure UPS-2—Provide protection from stray electrical currents.** This mitigation measure is described above.

**Mitigation Measure UPS-4—Maintain clearance beneath electrical transmission lines.** The relocation or grade adjustment of existing support towers, pipelines, and facilities may prove necessary to maintain proper clearances. Early consultation with appropriate staff of all parties referenced above in the engineering design process will be done to minimize any potential conflicts resulting from the WSX Alternative.

**Monitoring:**

1. BART staff will ensure and Monitor will verify that coordination with San Francisco Water Department and the ACWD staff has occurred.
2. BART staff will review appropriate contract documentation to verify protection from stray electrical currents and proper clearance from electrical transmission lines.

**Impact UPS-4—Construction-related service interruptions.**

**Mitigation Measure UPS-1—Coordinate with the San Francisco Public Utilities Commission and ACWD staff.** This mitigation measure is described above.

**Mitigation Measure UPS-5—Coordinate with affected utilities, companies, and agencies that own pipelines and underground conduits to arrange necessary relocation and protection of existing lines.**

1. Any interruption of underground utility service will be coordinated with the service provider(s) well in advance of the projected date of interruption. In particular, BART shall continue to coordinate with ACWD during design of modifications to the water distribution system to ensure that impacts to ACWD's operations are minimized.
2. Consultation with appropriate staff in the engineering design process is necessary to minimize any potential conflicts resulting from implementation of the WSX Alternative. Scheduling of BART construction should account for sufficient lead-time required for the involvement of utility staff.
3. Electrical Power and Natural Gas

PG&E has established strict regulations regarding the possible disturbances of its electrical facilities and gas pipelines for construction purposes. The construction staging process of the WSX Alternative will account for access to the PG&E right-of-way for emergency purposes, maintenance repairs, and future improvements. The exact location of the gas pipeline

crossings will be ascertained prior to doing any work in the area, and this effort will be coordinated with PG&E staff.

#### 4. Sewer Line

- a) Interim sewer lines and/or drainage should be provided to avoid flooding if any change or improvement to the existing system proves necessary. Work on the sewer systems will be scheduled to avoid periods of peak flow. It is essential that the construction staging process of the BART project account for access to the sewer right-of-way for emergency purposes, maintenance repairs, and future improvements.
- b) The Union Sanitary District has a policy that will not allow sewerage-lift stations, which may result from the relocation of pipelines associated with the BART improvements. Therefore, design of all relocated sewer lines would be coordinated with the sanitary district.

#### 5. Communication Utilities

- a) The exact location and elevation of the cables and conduits will be determined prior to doing any work in the area, and this effort should be coordinated with the staff of all aforementioned communication utilities parties. This coordination also will take place prior to placing any new utility, landscape vegetation, and fencing. As previously mentioned, the relocation or adjustment of existing lines may prove necessary to maintain proper clearances.
- b) The construction staging process of the WSX Alternative will account for access for emergency purposes, maintenance repairs, and future improvements.
- c) The complicated transfer of customers data line required as a result of the relocation of the fiber optic communication systems is expected to have longer lead times than other utilities. Existing agreements with fiber optic companies will enable BART to include sufficient lead-time in the master project schedule to avoid conflicts.

#### 6. Petroleum Pipelines

- a) Plans for grading near petroleum pipelines should be reviewed by authorized Kinder Morgan and Chevron Pipeline personnel to avoid damage to their pipelines. Kinder Morgan and Chevron Pipeline have established guidelines regarding the possible disturbances of their pipelines for construction purposes. The exact location of their pipelines will be ascertained prior to doing any work in the area, and this effort should be coordinated with Kinder Morgan and Chevron Pipeline staff. This coordination also will take place prior to placing any new utility lines, landscape vegetation, and fencing. As previously mentioned, the relocation or grade adjustment of existing pipelines may prove necessary to maintain proper clearances. Coordination with Kinder Morgan and Chevron Pipeline during the engineering design process will minimize potential impacts and lay the basis for a future agreement regarding any potential conflict.
- b) Emergency access will be provided before and after construction of the WSX Alternative.



## 7. Water

- a) At BART alignment crossing locations, the relocation and adjustment of the grades of existing facilities may be necessary. Emergency access before and after construction of the WSX Alternative also will be provided. The placement of new BART track ballast, structures, or related improvements must have adequate clearance from existing facilities.
- b) During the final design of the WSX Alternative, BART will consider and coordinate construction with the future upgrades of the existing water systems.

## 8. Storm Drain

- a) At crossing locations the relocation and adjustment of existing drainage facilities may prove necessary. Upgrade of existing drainage systems may be considered in order to maintain existing drainage patterns after completion of the BART construction.
- b) Interim drainage can be provided to avoid flooding if any changes or improvements to the existing systems prove necessary. Construction in the potentially affected areas should be done in the dry months to limit the demand on the interim drainage systems.
- c) Emergency access before and after construction of the WSX Alternative also will be provided.

### **Monitoring:**

1. BART staff will ensure and Monitor will verify that a review of project utility relocation plans is conducted, and Monitor will verify that the relocation of utilities, pipelines, and fiber optic cables is done with the coordination of the respective agency or company.
2. BART staff will review appropriate contract documentation to verify access during construction, provision of interim lines, and work schedule. Monitor to verify in the field.

## Safety and Security

### Impact SS-1—Impacts on local community safety services.

**Mitigation Measure SS-1—Coordination with the Fremont Fire Department.** The potential addition of subways and depressed sections along the alignment in the City of Fremont would require emergency preparation work with the Fremont Fire Department. BART will provide additional training and coordination with the Fremont Fire Department, as necessary. The Fremont Fire Department would also be given the opportunity to comment on the engineering plans for the WSX Alternative as they are developed. BART's Safety engineers would review the fire department's recommendation for design modification that would further BART's system safety goals.

#### Monitoring:

1. Monitor will verify that BART provides additional coordination and training for the Fremont Fire Department.
2. BART staff will ensure and Monitor will verify that the Fremont Fire Department has been given an opportunity to review and comment on construction plans

### Impact SS-2—Inadequate lighting or visual obstructions at stations and park-and-ride lots.

#### Mitigation Measure SS-2(a)—Implement safety and security criteria to deter crime.

1. A Safety and Security Certification Plan will be implemented for the WSX to ensure that the design, construction, and installation of equipment are systematically reviewed for compliance with safety and security requirements prior to revenue operations.
2. BART will design and operate the WSX Alternative in accordance with applicable California Public Utilities Commission (CPUC) regulations to minimize the frequency and severity of criminal activities.

**Mitigation Measure SS-2(b)—Use cameras, and security patrols to enhance safety.** BART stations, park-and-ride lots, and train cars will be equipped with video-surveillance recording systems to further enhance security. BART will extend coverage provided by the regular BART Police Department to new train operations and will patrol all facilities on a regular basis to maintain customer security.

#### Monitoring:

1. BART staff will ensure that the WSX Alternative is designed and operated in accordance with applicable CPUC regulations and Monitor will verify that BART implements the Safety and Security Plan.

2. BART staff will ensure and Monitor will verify that BART Police Services or other security measures have been expanded to serve the Warm Springs Extension as necessary.

**Impact SS-3—Safety of workers and work sites during construction.**

**Mitigation Measure SS-3—Implement safety rules, procedures and policies to protect workers and work sites during construction.** The contractor is responsible for the safety of the work site, work personnel, and maintaining California Occupational Safety and Health Administration (Cal-OSHA) work practices during construction. The WSX Alternative project management would ensure that the contractor implements actions to insure the safety of workers and work sites during construction. The project management is responsible for general plan review, construction site inspection, review, and approval of the contractor’s safety plan, and compliance with the BART Operating Rules & Procedures Manual. Potential safety and security impacts during the construction period would be addressed through compliance with federal Occupational Safety and Health Administration (OSHA), state (Cal-OSHA), and BART policies that provide for protection of workers and site visitors. The contractor would be responsible for ensuring the security of construction equipment and materials in the field during construction.

**Monitoring:**

Monitor will verify that contractor implements applicable safety rules and procedures during construction.