# 4.18 WATER RESOURCES, WATER QUALITY, AND FLOODPLAINS

## 4.18.1 INTRODUCTION

This section updates information on water resources, water quality, and floodplains within or along the Phase 1 alignment since certification of the FEIR and SEIR-1. One notable change is the adoption of a new Municipal Regional Stormwater Permit, as discussed below in **subsection 4.18.3**.

## 4.18.2 ENVIRONMENTAL SETTING

The environmental setting described in the FEIR for weather and climate, groundwater resources, surface water resources, and floodplains remains applicable in the SEIR-2. Please refer to the subsection 4.18.2 of the FEIR for this discussion.

## 4.18.3 REGULATORY SETTING

The regulatory setting presented in the FEIR, which describes the federal Clean Water Act, floodplain management laws and regulations, Porter-Cologne Water Quality Control Act, and several local laws and regulations, remains applicable in the SEIR-2. Please refer to subsection 4.18.3 of the FEIR for this discussion.

The San Francisco Bay Regional Water Quality Control Board adopted a new National Pollutant Discharge Elimination System (NPDES), Municipal Regional Stormwater Permit on October 14, 2009 (Order R2-2009-0074 NPDES Permit No. CAS612008) for the discharge of stormwater runoff from municipal storm sewer systems for municipalities and local agencies ("the permittees") that have joined together to form the Alameda Countywide Clean Water Program and the Santa Clara Valley Urban Runoff Pollution Prevention Program. These programs are briefly described in subsection 4.18.3.5 of the FEIR. The new permit standardizes stormwater management requirements throughout the San Francisco Bay region. The intent of the permit is to reduce stormwater runoff and pollution, protect water quality, and promote groundwater recharge. The Municipal Regional Stormwater Permit became effective on December 1, 2009 and will be implemented in phases. Of particular interest is the fact that all projects required to treat stormwater must incorporate low-impact development methods to control onsite pollutants by reducing runoff and allowing infiltration of water. These methods include rainwater harvesting and reuse, infiltration, evapotranspiration,[1] or biotreatment,[2] among others. In addition, certain projects

[1] The return of water from the soil and from plants to the atmosphere by evaporation and transpiration.

[2] Filtering stormwater through vegetation and soils before discharging to the storm drain system.

(such as uncovered parking areas, either stand-alone or part of another use) that create and/or replace 5,000 square feet or more of impervious surface will be required to provide low-impact development treatment methods. During subsequent engineering phases, the design of Phase 1 will incorporate stormwater treatment features for trackways, facilities, and stations that comply with the new permit.

## 4.18.4 PROJECT IMPACTS AND MITIGATION MEASURES

This subsection updates information from the FEIR and SEIR-1 and addresses several design changes that merit discussion of potential Phase 1 impacts to water resources, water quality, and floodplains. These changes include the access road from Fremont to San Jose; the system facilities alternate locations in Fremont; drainage improvements at Toroges Creek, Line B, and Berryessa Creek; the Dixon Landing Road alignment; the Retained Cut Option from Curtis Avenue to Trade Zone Boulevard; and modifications to the Berryessa Station.

Table 4.18-2 in the FEIR includes a mitigation measure for a minor impact to the floodplain at Agua Caliente Creek/Line F in Alameda County. The mitigation measure stated, “Place support columns outside of creek base flood effective flow area.” This measure is no longer applicable, as the cross-drainage structure at Agua Caliente Creek would be upgraded within the SVRTC and UPRR ROW as part of Phase 1 in lieu of a bridge structure within SVRTC ROW only. VTA, in collaboration with the Alameda County Flood Control and Water Conservation District (ACFCWCD), would install a second 78-inch reinforced concrete pipe (RCP) culvert parallel to the existing 81-inch RCP culvert. At the inlet of both pipes, a new double-box culvert would extend upstream to accommodate the SVRTC tracks and maintenance access road (Design Change 2, Access Road from Fremont to San Jose). The proposed improvements would be able to convey the ultimate 100-year design flow of 1,100 cubic feet per second (cfs) and would eliminate the 100-year floodplain east of the SVRTC ROW. The capacity of the Agua Caliente Creek channel downstream of the SVRTC and UPRR ROW is adequate to convey the design flow without overtopping.

Table 4.18-2 in the FEIR also includes a mitigation measure to “provide one-foot minimum freeboard above base flood elevation at all access points to underground structures.” This measure has been updated to state that the retained cut sections, retained fill sections, station entrances, and access points should maintain 6 inches to 1 foot of freeboard above the base 100-year flood elevation, as required.

As stated in the FEIR and SEIR-1, VTA has coordinated and will continue to coordinate with the ACFCWCD, Santa Clara Valley Water District (SCVWD), Alameda County Public Works Agency, Milpitas Department of Public Works, San Jose Department of Public Works, Santa Clara Department of Public Works, and other regulatory agencies to ensure the proper design of drainage facilities to

control erosion and siltation; to incorporate appropriate measures for flood protection; and to minimize impacts to pipelines and supporting facilities.

Additionally, Phase 1 would include best management practices to reduce pollutants from stormwater runoff that are consistent with the NPDES Municipal Regional Stormwater Permit, NPDES General Industrial Storm Water Permit, MS4 permits, and/or General Waste Discharge Requirements.

Phase 1 would not be subject to impacts related to tsunami, seiche, or mudflow. A tsunami is a large tidal wave generated by an earthquake, landslide, or volcanic eruption. Large earthquakes occurring in the Pacific Ocean can generate seismic sea waves such as tsunamis. Phase 1 is located approximately 25 to 30 miles east of the Pacific shoreline. Due to this distance, Phase 1 would not be located in an area of elevated risk of inundation by tsunami. A seiche is a standing wave in an enclosed or partially enclosed body of water such as San Francisco Bay. Phase 1 is approximately 5 to 10 miles east of San Francisco Bay in areas of relatively flat lands that are not adjacent to any hillsides. Therefore, there is no elevated risk of seiche or mudflow, and impacts would be less than significant.

#### 4.18.4.1 Design Change 2. Access Road from Fremont to San Jose (STA 35+00 to STA 510+00)

The approved project included a maintenance access road east of the existing UPRR tracks and within the UPRR ROW from Hostetter Road to the Sierra Road and Lundy Avenue intersection. Under Phase 1, this access road would extend from the approved BART Warm Springs Station in Fremont to just north of Berryessa Road in San Jose.

The “all-weather” maintenance access road would mainly be permeable (e.g., a gravel road), except in select locations where the added strength of concrete/asphalt would be required, such as at high rail vehicle access points. It is not expected that the road would cause an increase in stormwater runoff to the storm drain system or directly into the creeks, and any runoff that does occur is not expected to violate water quality standards or waste discharge requirements. The road would not increase the base flood elevation. Infiltration from the permeable road would allow for some groundwater recharge. Design Change 2, Access Road from Fremont to San Jose, would not result in impacts to water resources, water quality, and floodplains.

#### 4.18.4.2 Design Change 3. Systems Facilities Alternate Location A (STA 28+00)

During preliminary engineering, an alternate location for High Voltage Substation SRC and Switching Station SRR was identified east of the UPRR Warm Springs Yard near Warm Springs Court in a vacant lot in Fremont. If this location were chosen for these facilities, impervious surface would replace a portion of the

vacant lot. Adding impervious surface would increase the volume of stormwater runoff to the storm drain system. However, it is not anticipated that runoff volumes would exceed the capacity of existing or planned drainage systems. BART design criteria for Phase 1 require that drainage systems that collect runoff must either be of adequate size and design to convey the surface flow generated by a 10-year storm event or must meet the minimum requirements of the cities, whichever is greater. In addition, the facility design would incorporate stormwater best management practices required under the new Municipal Regional Stormwater Permit to reduce stormwater runoff and pollution, protect water quality, and promote groundwater recharge.

The nearest creek/drainage channel to the alternate location for the High Voltage Substation SRC and Switching Station SRR is Agua Caliente Creek/Line F, which is approximately 1,500 feet south of this new facility. The Flood Insurance Rate Map (FIRM) for Agua Caliente Creek (Panel Number 065028 0046D) indicates that in the upper reach of the creek between the railroad corridor and Warm Springs Boulevard, the allowable 100-year discharge of 945 cubic foot per second (cfs) established by the Federal Emergency Management Agency (FEMA) is contained in the channel until approximately 400 feet east of the corridor. The potential for flooding during a 100-year storm event at this location would be eliminated by constructing a new cross-drainage structure under the alignment and UPRR ROW to accommodate the 100-year design flow (1,100 cfs), as described above. This alternate location for the High Voltage Substation SRC and Switching Station SRR would not impact drainage or flooding conditions. At locations where critical facilities are not already located above the 500-year floodplain elevations, these facilities would be raised to levels above the 500-year floodplain.

#### 4.18.4.3 Design Change 5. Drainage Improvements at Toroges Creek (Line C) (STA 101+00)

Under the approved project, a new box culvert would be constructed along the alignment at Toroges Creek by other entities. Under Phase 1, VTA would construct this culvert as part of BART Silicon Valley to accommodate the BART trackway and the maintenance access road (see Design Change 2, Access Road from Fremont to San Jose, above).

On the east side of the railroad corridor, Toroges Creek flows in a concrete-lined, trapezoidal channel with earthen embankments and then flows into the following structures: a concrete transition structure, an 11-foot-wide by 5-foot-high reinforced concrete box culvert, an 11-foot-wide by 3.5-foot-high rectangular channel with earthen embankments, and a transition drop structure. On the west side of the railroad corridor, the creek flows in a trapezoidal earthen channel. Within the corridor, timber trestle structures support a walkway and the westernmost UPRR freight tracks over the rectangular channel.

The FIRM for Toroges Creek (Panel Number 065028 0048D) indicates that upstream of the railroad corridor, the FEMA-established 100-year discharge of 460 cfs is contained in the channel and in the drainage structures under the railroad corridor. There is no floodplain mapped on the FIRM at this location. The Alameda County Flood Control and Water Conservation District's 100-year design flow of 594 cfs for Toroges Creek near the corridor was used in the hydrologic model to determine existing conditions. The model showed that flow is restricted by the existing reinforced concrete box culvert, which causes a rise in the headwater elevations upstream. Floodwaters may not overtop the tracks but may flow along the east edge of the railroad corridor. **Figure 4.18-1** shows the limits of the 100-year floodplain near Toroges Creek in relation to the Phase 1 alignment.

The existing 11-foot-wide by 5-foot-high reinforced concrete box culvert would be reconstructed as a 13-foot-wide by 5-foot-deep concrete box culvert under the railroad corridor; the new culvert would transition to a 10-foot-wide, minimum 5-foot-deep, U-shaped concrete channel.

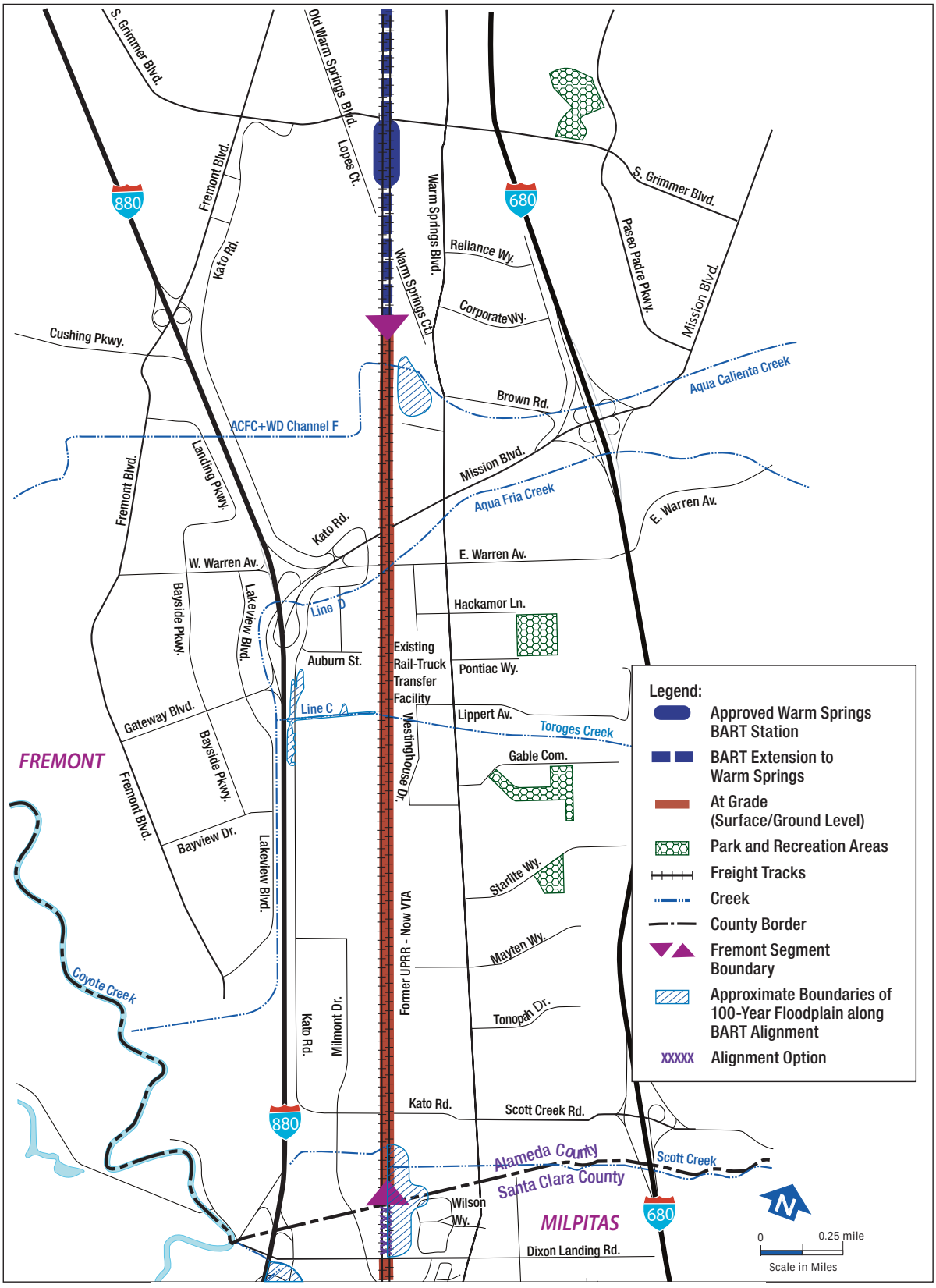
The drainage improvements at Toroges Creek/Line C would not increase the base floodplain elevation or impact natural and beneficial floodplain values, as the area is currently developed and has no or limited undisturbed wildlife, open space, or other natural values.

#### 4.18.4.4 Design Change 6. Eliminate Drainage Improvements at Unnamed Creek – Line B (STA 146+00)

Under the approved project, VTA would construct a new box culvert along the alignment at Line B. However, the construction of this box culvert was completed in 2009 as part of VTA's Freight Railroad Relocation/Lower Berryessa Creek (FRR/LBC) Project. Under the FRR/LBC Project, the drainage improvements were required to accommodate the relocated tracks and meet flood control requirements. No additional work or impacts are anticipated at Line B with implementation of Phase 1.

#### 4.18.4.5 Design Change 8. Dixon Landing Road Alignment (STA 182+00 to STA 201+00)

In the FEIR, three options were analyzed for the alignment at Dixon Landing Road: at grade, retained cut, and aerial. The retained cut and at grade designs were also analyzed in the SEIR-1; however, there were no updates related to water resources, water quality, or floodplains in the latter document. This SEIR-2 again considers both at grade and retained cut designs.




Source: VTA, 2010.

Note: Approximate Locations Shown, Study Area Limits = 0.25 miles on either side of BART Alternative

Figure 4.18-1: 100-Year Floodplain Within the Phase 1 Area – City of Fremont

The analysis in the FEIR states that the eastern side of the BART alignment would encroach upon the 100-year floodplain of Scott Creek between Scott Creek Road and Dixon Landing Road for about 0.3 mile. The cause of flooding was attributed to blockage of the culvert at Scott Creek; otherwise, the 100-year flood would be contained in the culvert under the railroad corridor.

The construction of an upgraded box culvert at Scott Creek was completed in 2009 as part of VTA's FRR/LBC. Under the FRR/LBC Project, the drainage improvements were required to accommodate the relocated tracks and meet design criteria for 100-year flow capacity for cross-drainage structures. Additionally, the recent residential development projects on either side of Scott Creek, immediately east of the tracks, improved the channel bank conditions and removed silt deposits. Therefore, overtopping of the creek between Scott Creek and Dixon Landing Road during a 100-year flood is not anticipated. Impacts to drainage conditions as a result of Design Change 8, Dixon Landing Road Alignment, are not anticipated.

#### 4.18.4.6 Design Change 9. Eliminate Drainage Improvements at Berryessa Creek (STA 246+00)

Under the approved project, VTA would construct a new multi-cell box culvert along the alignment at Berryessa Creek. However, the construction of this box culvert was completed in 2010 as part of VTA's FRR/LBC. Under the FRR/LBC Project, the drainage improvements were required to accommodate the relocated tracks, meet design criteria for 100-year flow capacity for cross-drainage structures, and conform to the future SCVWD's Lower Berryessa Creek Flood Protection Project. No additional work or impacts are anticipated at Berryessa Creek under Phase 1.

#### 4.18.4.7 Design Change 12. Curtis Avenue to Trade Zone Boulevard (STA 344 to STA 414+00)

In the FEIR, a "long" retained cut was analyzed as the only design configuration for the alignment from south of Curtis Avenue to Trade Zone Boulevard (STA 337+00 to 411+00). In the SEIR-1, there were four options for the alignment: Retained Cut Long Option, Retained Cut Short Option, Aerial Long Option, and Aerial Short Option. In 2007, the VTA Board of Directors selected the Retained Cut Long Option as part of the approved project (STA 337+00 to 411+00). As a result of preliminary engineering design, the retained cut has been changed under Phase 1 such that the starting point of the retained cut would vary depending on which Milpitas Wye Relocation Option is selected. The existing locomotive wye in Milpitas would be modified to one of the three configuration options described in Design Change 12, Curtis Avenue to Trade Zone Boulevard (see **subsection 3.2.3** of this SEIR-2). For the Milpitas Wye with Spur Connection Option and Wye and Industrial Lead Option, the BART retained cut would begin at STA 344+00 and end at approximately STA 414+00. For the No Wye/Industrial Lead Only Option, the BART retained cut would begin at STA

356+00 and end at STA 414+00. The length and depth of the retained cut enables the freight track to cross over the BART retained cut to access the locomotive wye on the east side of the ROW.

The revised length of the retained cut under Phase 1 is almost entirely within the limits of the previously analyzed retained cut configuration described in the FEIR and SEIR-1, as listed below.

- FEIR limits, STA 337+00 to 411+00 (7,400 feet)
- SEIR-1 limits, STA 337+00 to 411+00 (7,400 feet)
- SEIR-2 limits / Milpitas Wye with Spur Connection and Wye and Industrial Lead Options, STA 344+00 to 414+00 (7,000 feet)
- SEIR-2 limits / No Wye/Industrial Lead Only Option, start at STA 356+00 and end at STA 414+00 (5,800 feet)

Both the Milpitas Wye with Spur Connection and Wye and Industrial Lead Options and the No Wye/Industrial Lead Only Option configurations begin farther south by 700 feet and 1,900 feet, respectively, and end 300 feet beyond the configuration described in the FEIR and SEIR-1. The entire length of the retained cut, including this additional 300 feet south of Trade Zone Boulevard, is not located near any creek or drainage channel crossing or within a 100-year floodplain. Therefore, the analysis in the FEIR and updates provided in the SEIR-1 for water resources, water quality, and floodplains remain applicable in this SEIR-2. No additional impacts are anticipated due to the design change for the retained cut at this location.

#### 4.18.4.8 Design Change 20. Berryessa Station (STA 533+00)

There are several design changes to the Berryessa Station area, as described in **subsection 3.2.4** of this SEIR-2. However, the station footprint remains essentially the same as described in the FEIR and SEIR-1. During subsequent engineering phases, the design of the Berryessa Station area will incorporate stormwater treatment features that comply with the new Municipal Regional Stormwater Permit.

As described in **Section 4.4**, **Biological Resources**, of this SEIR-2, VTA has proposed design and implementation of onsite mitigation for biological impacts at the northeast corner of Berryessa Station that would improve existing conditions along a portion of Upper Penitencia Creek. The conceptual plan for the mitigation site includes realigning the channel to soften a >90-degree turn; creating a flood bench; removing existing hardscape (e.g., box culvert, riprap); and planting native wetland and riparian vegetation. The design of the mitigation site would accommodate the proposed Upper Penitencia Creek Flood Control Project and would reduce some flooding in the station area. It is anticipated that construction of the site, including planting, would occur during summer/fall 2012. The proposed mitigation project will be analyzed in a separate environmental

document. The residual floodplains of Upper Penitencia Creek, after re-alignment of the channel, would not be significantly impacted by the station structures and the aerial guideways on either side of the station would not impede the east-west flood flows. Additionally, the site would be graded such that existing floodplain depths are not impacted.

## 4.18.5 CONCLUSION

The design changes under Phase 1 would not expose people or structures to the risk of flooding, tsunami, seiche, or mudflow; violate water quality standards or waste discharge requirements; create or contribute runoff that would exceed the capacity of existing or planned drainage systems; provide substantial additional sources of polluted runoff; or substantially alter drainage patterns with a resultant increase in erosion or siltation. The design requirements and Best Management Practices related to water resources, water quality, and floodplains included in the FEIR and SEIR-1 remain applicable, and the requirements outlined in the new Municipal Regional Stormwater Permit will be implemented. No new mitigation is necessary.

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