

4.17 Water Resources, Water Quality, and Floodplains

4.17.1 Introduction

This section describes the affected environment and environmental consequences related to water resources, water quality, and floodplains from operation of the NEPA Alternatives. The discussion of existing conditions below is based on information from *VTA's BART Silicon Valley—Phase II Extension Project Hydrology and Water Quality Technical Report* (WRECO 2016a) and *VTA's BART Silicon Valley—Phase II Extension Project Location Hydraulic Study* (WRECO 2016b).

4.17.2 Existing Conditions and Regulatory Setting

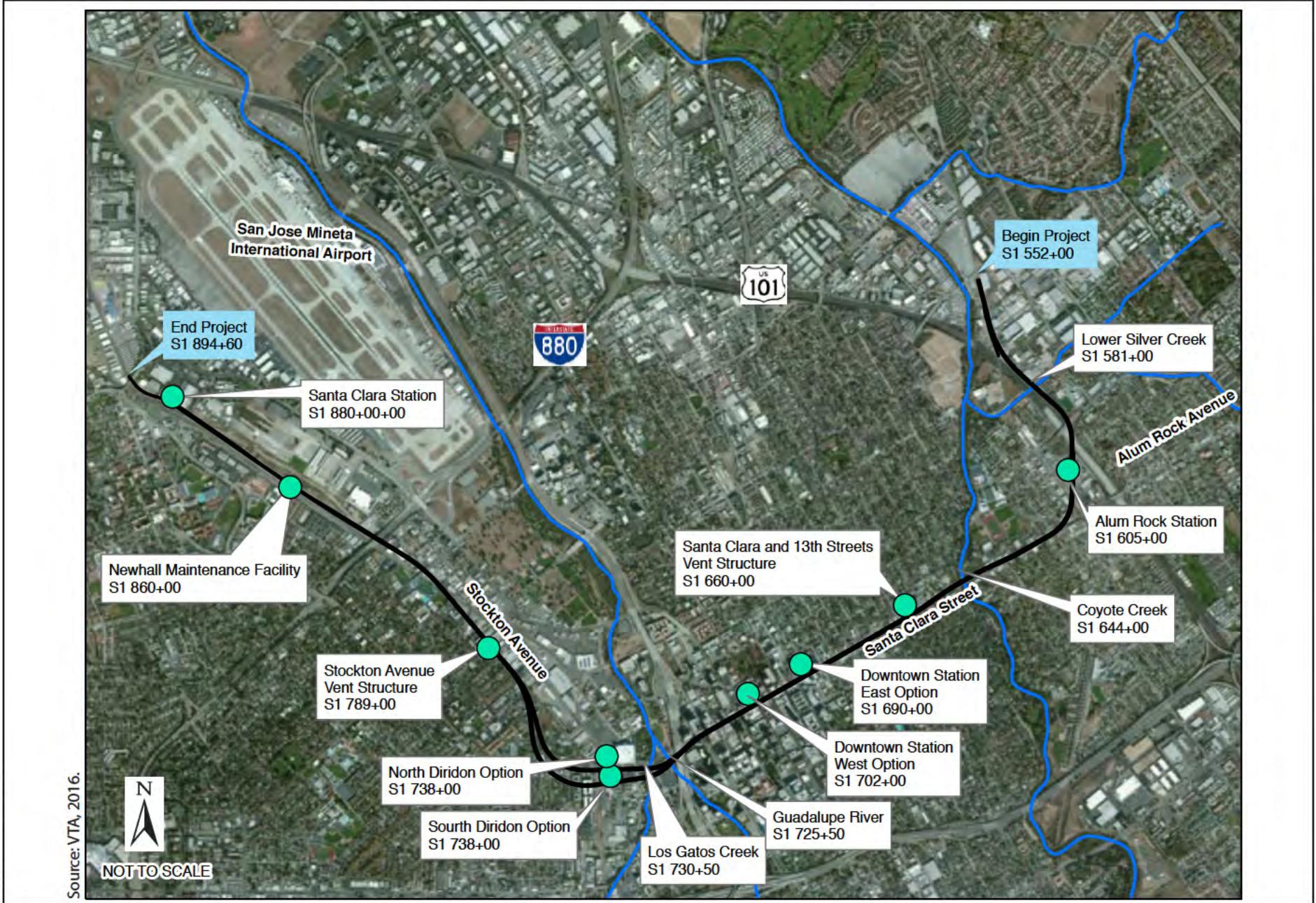
4.17.2.1 Environmental Setting

This section discusses existing conditions related to water resources, water quality, and floodplains in the study area.

Surface Water Hydrology

Creek and River Crossings

The BART Extension is within four watersheds: Lower Silver Creek, Coyote Creek, Guadalupe River, and Los Gatos Creek. All four watersheds within the study area limits ultimately discharge to South San Francisco Bay. The alignment would cross four water bodies: Lower Silver Creek, Coyote Creek, Los Gatos Creek, and the Guadalupe River (receiving water bodies for the stations) (Figure 4.17-1, Table 4.17-1) (WRECO 2016b).



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Figure 4.17-1
Waterways Crossing the Study Area
 VTA's BART Silicon Valley–Phase II Extension Project

Table 4.17-1: Creek and River Crossings

Approximate Creek Crossing Station	Waterway	Drainage Area		1% Flood Discharge ^a (cubic feet per second)
		(square miles)	(acres)	
S1 581+00	Lower Silver Creek	44	28,160	2,670
S1 644+00	Coyote Creek	247	158,080	12,500
S1 725+50	Guadalupe River	144	92,160	10,000
S1 732+25	Los Gatos Creek	54.8	35,072	7,980

Source: WRECO 2016b.
^a. Federal Emergency Management Agency's Santa Clara County Flood Insurance Study.

Coyote Creek

The Coyote Creek watershed is the largest watershed in the Santa Clara Basin. It drains approximately 247 square miles (158,080 acres) from the Diablo Range on the east side of the Santa Clara Basin. Coyote Creek originates in the mountains northeast of the City of Morgan Hill, then flows northwest for 42 miles before flowing into Lower San Francisco Bay. At the base of the Diablo Range, Coyote Creek is impounded by two dams that form Coyote Reservoir and Anderson Reservoir.

Lower Silver Creek

Lower Silver Creek is one of the tributaries that drain to Coyote Creek. The Lower Silver Creek watershed drains approximately 44 square miles (28,160 acres). Lower Silver Creek originates near Silver Creek Road in San Jose and flows northerly to the Lake Cunningham area. It then flows in a northwesterly direction to its confluence with Coyote Creek in the City of San Jose.

The Santa Clara Valley Water District (SCVWD), in cooperation with the Natural Resources Conservation Service and the Guadalupe Coyote Resource Conservation District, proposed an approximately 4.4-mile-long section of Lower Silver Creek between its confluence with Coyote Creek and Lake Cunningham to provide flood protection from a 1 percent annual chance event. The construction for Reach 1 through Reach 3 of this six-reach flood control project was completed in 2006. As a result of this flood protection effort, the area northeast of the US 101/Lower Silver Creek crossing is no longer within a floodplain. However, the area south of the Lower Silver Creek remains within the base floodplain because this area is within the commingled floodplain of both Lower Silver Creek and Coyote Creek. Upon completion of all six reaches and Lake Cunningham, SCVWD and the City of San Jose will be able to demonstrate to FEMA that all homes and businesses subject to the 1 percent annual chance flood from Lower Silver Creek have been protected. Work on Reaches 4–6 are on-going and according to SCVWD will run through December 2017.

Guadalupe River

The Guadalupe River watershed drains approximately 144 square miles (92,160 acres). It originates in the eastern Santa Cruz Mountains near the summit of Loma Prieta in Los Gatos. The Guadalupe River begins on the valley floor at the confluence of Alamitos Creek and Guadalupe Creek, just downstream of Coleman Road in San Jose. It then flows north for approximately 14 miles before discharging into the Lower South San Francisco Bay from Alviso Slough.

Los Gatos Creek

Los Gatos Creek, which originates in the Santa Cruz Mountains at an elevation of 3,483 feet, follows State Route (SR) 17 as it winds through the mountains. Upstream of the SR 17 crossing, the creek flows primarily in a natural channel; however, downstream of the crossing, some portions of the channel have been straightened. Downstream of SR 85, the creek continues parallel to SR 17 until it outfalls into the Guadalupe River in downtown San Jose.

Drainage Patterns

Runoff from the study area drains to an existing conveyance system, which consists of pipes, culverts, inlets, earth ditches, and natural swales and ponds. This existing conveyance system is tied to local rivers and creeks, which ultimately drain to South San Francisco Bay.

Flooding

Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) were used to identify the base floodplain, or the area with a 1 percent annual chance of an exceedance event, within the limits of the BART Extension Alternative. The BART Extension Alternative area contains all FIRM Special Flood Hazard Area (SFHA) categories (i.e., zones AE, AO, A, AH, D, X [shaded], and X [unshaded]), as shown in Figures 4.17-2 through 4.17-5. Zone AE is within the 100-year floodplain zone and represents areas with a 1 percent chance of flooding. Zone AO is within the 100-year floodplain zone and represents areas with a 1 percent chance of shallow flooding (usually sheet flow on sloping terrain), with specified flood depths of 1 to 3 feet. Zone A represents areas with a 1 percent annual chance of flooding (base flood elevations have not been determined for this zone). Zone AH is within the 100-year floodplain zone and represents areas with a 1 percent annual chance of shallow flooding, with specified flood depths of 1 to 3 feet. There are also portions of the BART Extension Alternative within Zone D, Zone X (shaded), and Zone X (unshaded). Possible but undetermined flood hazards can occur within Zone D; this area is not considered a SFHA, and no analysis of flood hazards has been conducted. Zone X (unshaded) includes areas where minimal flooding can occur, with elevations higher than areas with a 0.2 percent annual chance of flood event. Zone X (shaded) is an area with a moderate flood hazard, usually the area between the limits of 100- and 500-year floods (includes areas affected by a 0.2 percent annual chance of flood) (WRECO 2016b).

FEMA's 2009 *Flood Insurance Study: Santa Clara County and Incorporated Areas* was used to obtain existing floodplain information and supplement data provided by the FIRMs. The flood insurance study (FIS) provides hydrologic information and explains the methods of analysis that were used to generate the floodplain shown on the FIRMs. The FIS also includes profiles of the floodplain elevations. Table 4.17-2 summarizes the hydrologic, hydraulic, and base floodplain information.

Table 4.17-2: Floodplain Information

Approximate Floodplain Station	Flood Source	FIRM Number	Flood Hazard Zone	FIRM Panel Date	100-year Flood Depth (feet)	100-year Water surface elevation (feet)
555+00	Coyote Creek	06085C0251J 06085C0232H	AE	February 19, 2014 May 18, 2009	--	--
555+00	Coyote Creek	06085C0251J	AE (Floodplain)	February 19, 2014	--	82–83
565+00	Lower Silver Creek	06085C0251J	AH	February 19, 2014	--	87
581+00	Lower Silver Creek	06085C0251J	A	February 19, 2014	--	--
605+00	Lower Silver Creek/Coyote Creek	06085C0251J	AH/AO	February 19, 2014	1	89
725+00	Guadalupe River	06085C0234H	A	May 18, 2009	--	--
732+50	Los Gatos Creek	06085C0234H	A	May 18, 2009	--	--
745+00	N/A	06085C0234H	AO	May 18, 2009	1	—
880+00	N/A	06085C0234H 06085C0227H	AH/A	May 18, 2009 May 18, 2009	—	63–66

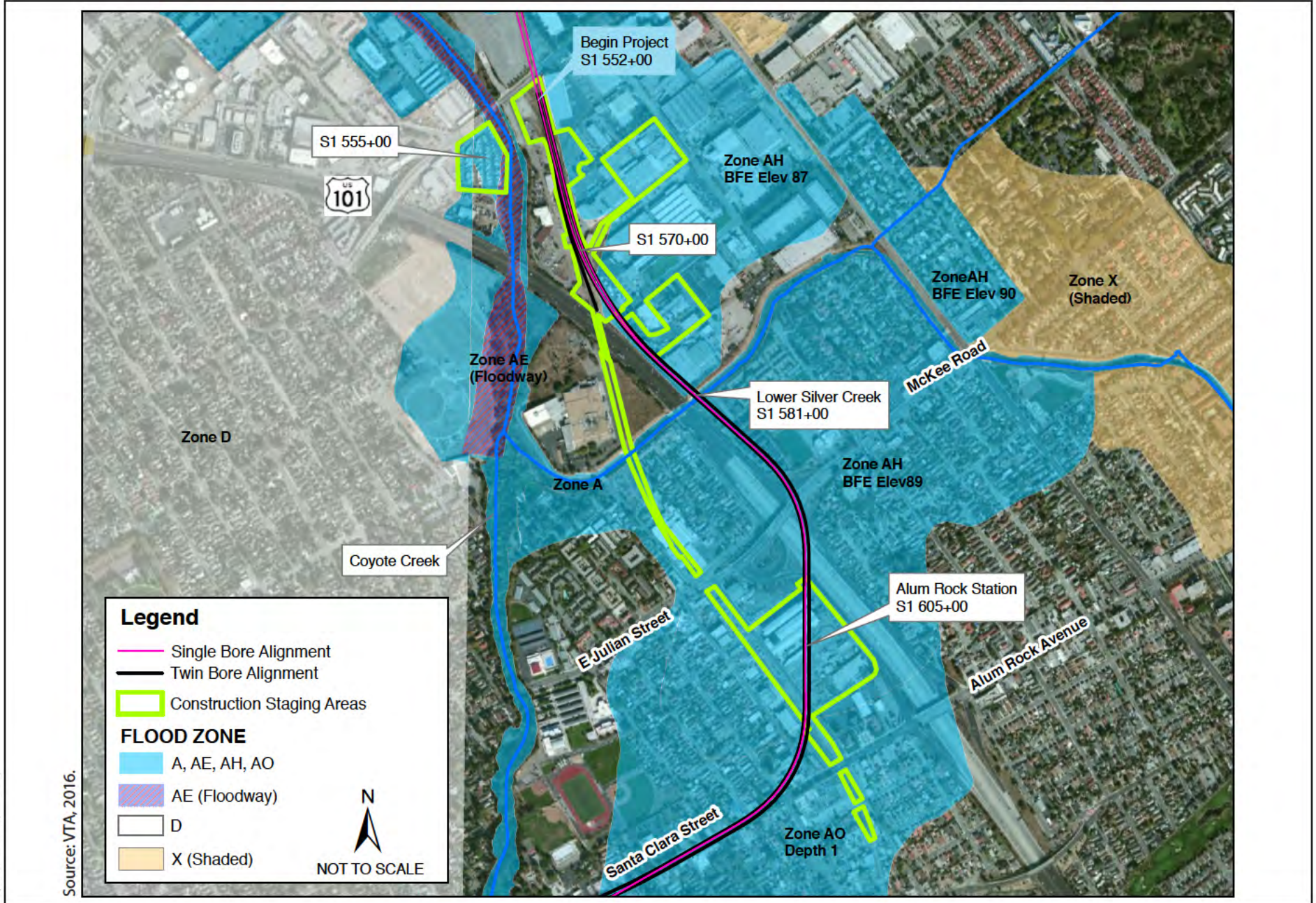


Figure 4.17-2
Floodplains, Part 1 of 4
 VTA's BART Silicon Valley-Phase II Extension Project

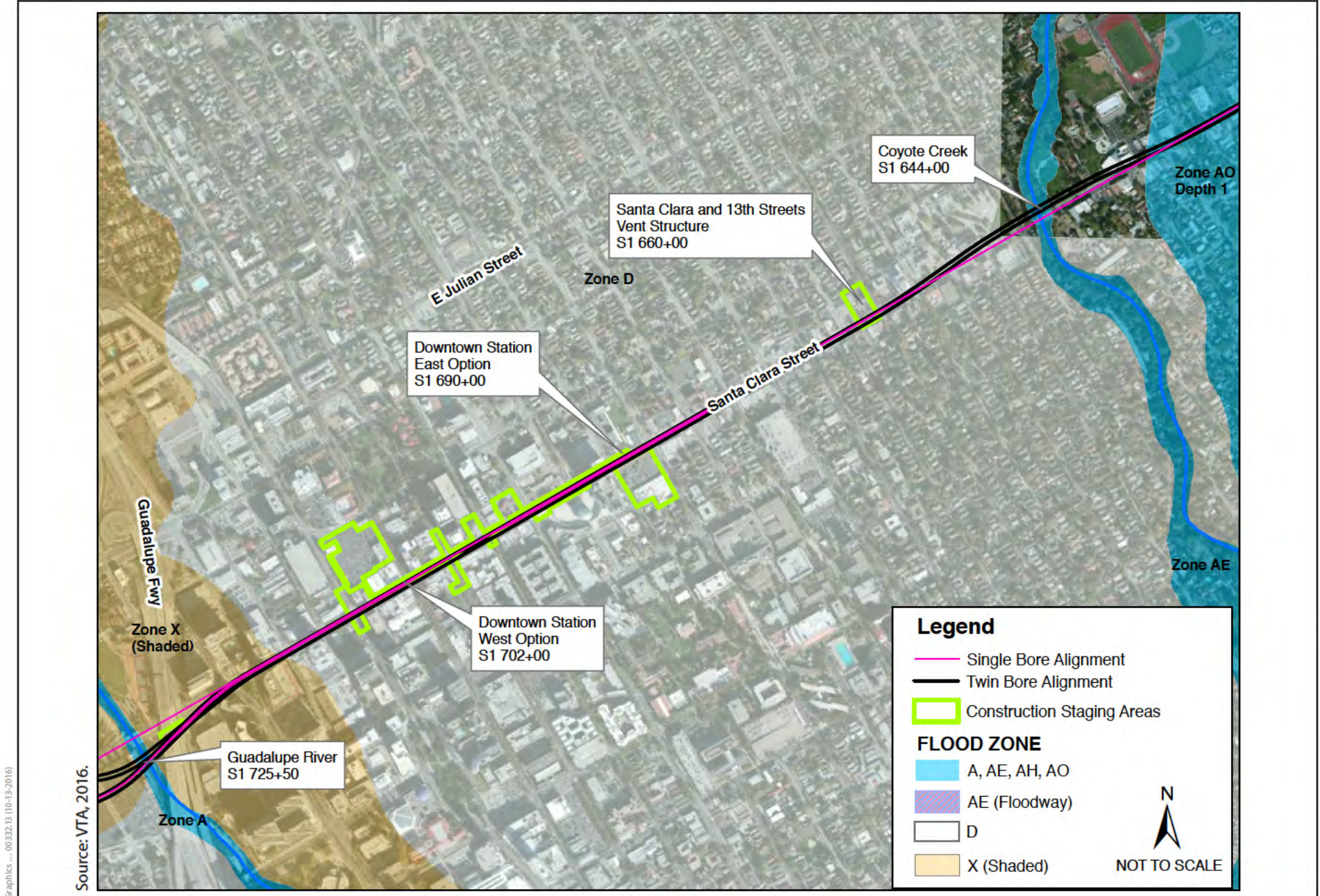


Figure 4.17-3
Floodplains, Part 2 of 4
 VTA's BART Silicon Valley-Phase II Extension Project

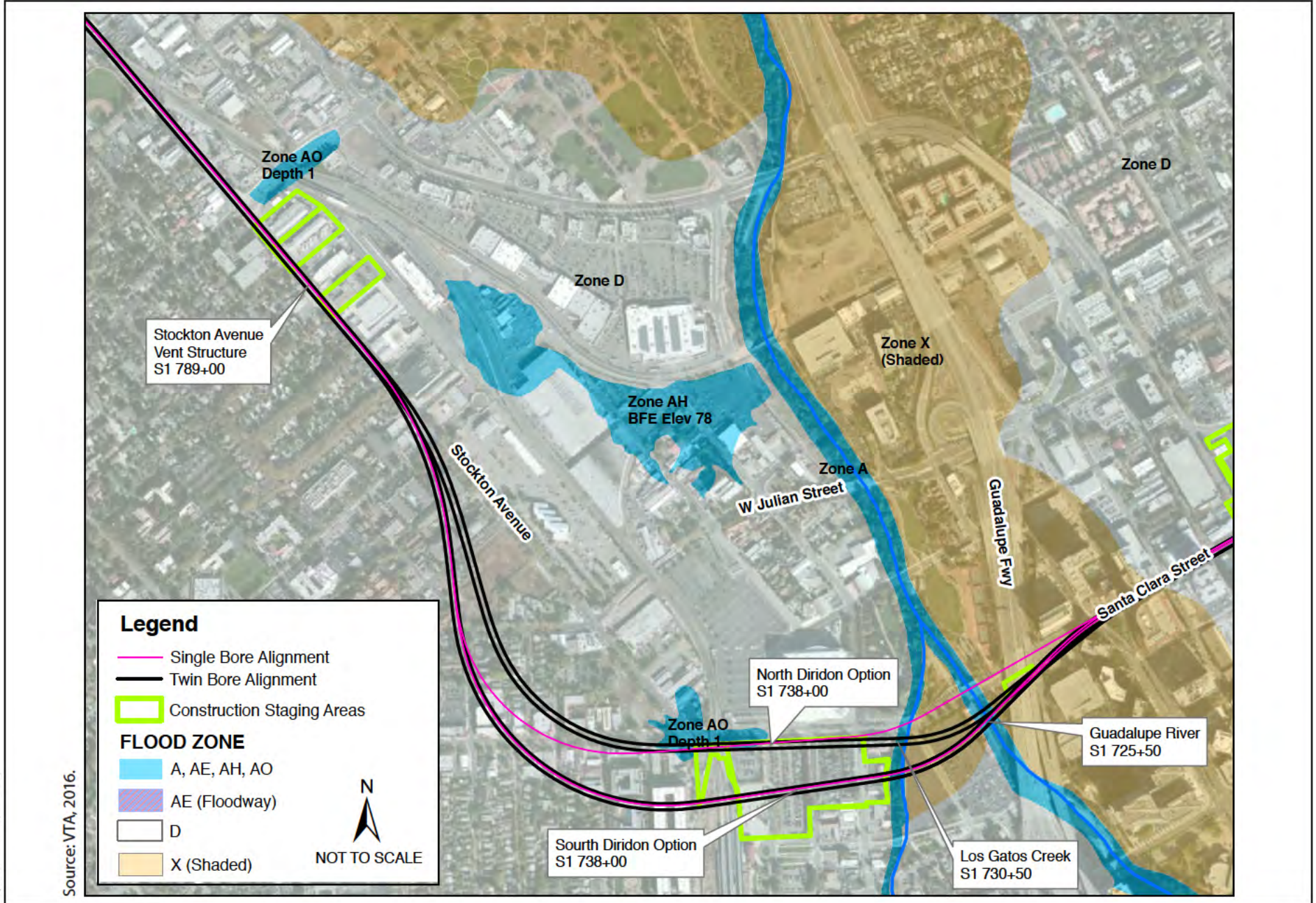
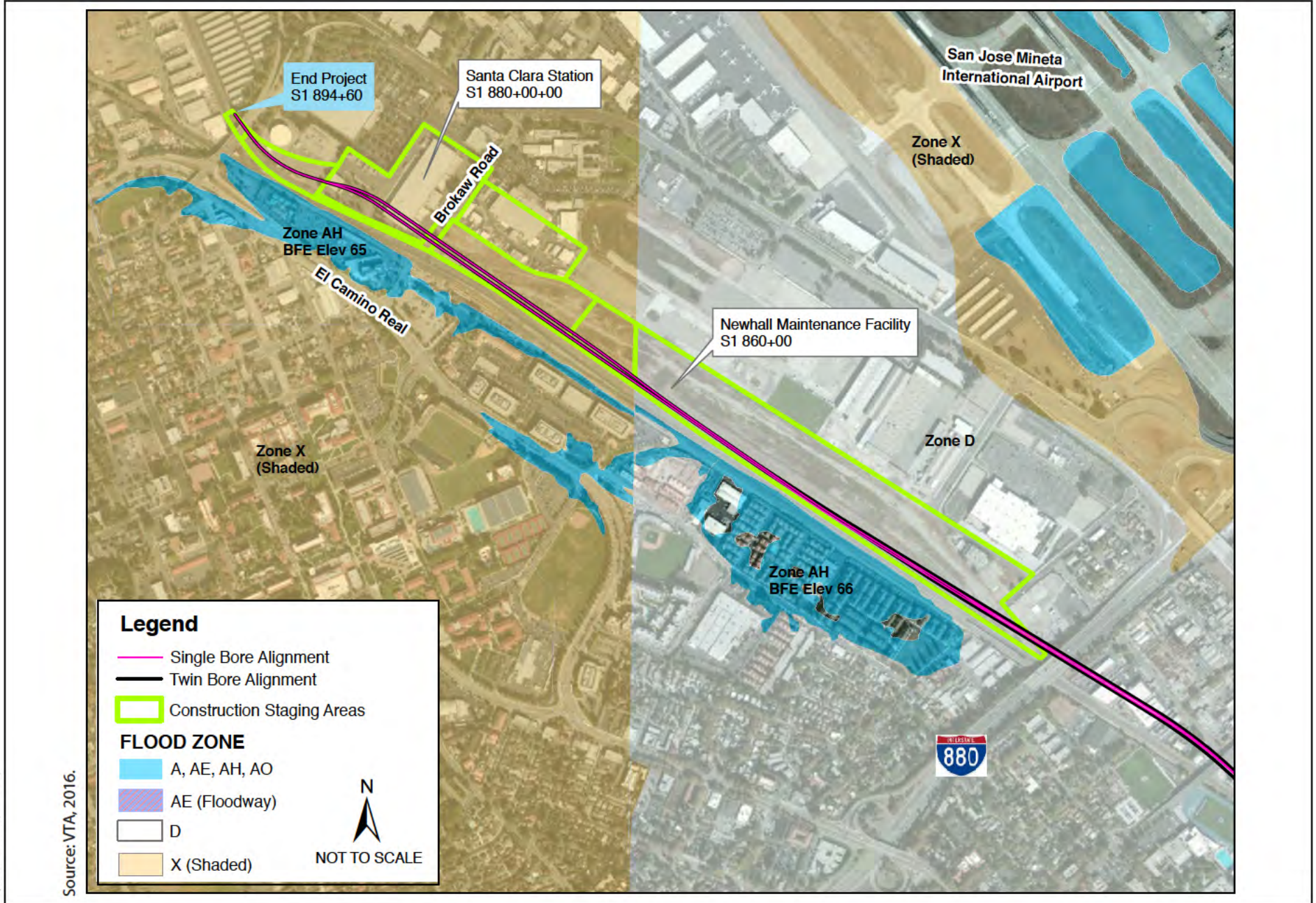


Figure 4.17-4
Floodplains, Part 3 of 4
 VTA's BART Silicon Valley-Phase II Extension Project



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Figure 4.17-5
Floodplains, Part 4 of 4
 VTA's BART Silicon Valley-Phase II Extension Project

Groundwater Hydrology

The BART Extension Alternative is located within the Santa Clara Valley groundwater basin and the Santa Clara subbasin (the subbasin is also known as Coyote Valley). The Santa Clara subbasin occupies a structural trough parallel to the northwest-trending Coast Ranges. To the north, the inland valley is drained by tributaries to San Francisco Bay, including Coyote Creek, the Guadalupe River, and Los Gatos Creek. The Coyote Valley region of the Santa Clara subbasin is fairly shallow, extending to a maximum depth of approximately 500 feet (California Department of Water Resources 2004).

Historically, water level declines from groundwater pumping have induced subsidence in the Santa Clara subbasin and caused degradation of the aquifer adjacent to the bay from saltwater intrusion. As a result of increases in recharge and decreases in pumping, groundwater levels have generally increased since 1965. According to *VTA's BART Silicon Valley—Phase II Extension Project Geotechnical Memorandum* (PARIKH 2014), groundwater has been detected at depths averaging between 14 and 18 feet below ground surface (bgs) in the study area (WRECO 2016a).

4.17.2.2 Water Quality

Water Quality Objectives/Standard Beneficial Uses

The San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan) identifies narrative and numerical water quality objectives for the region. The general objectives for the region involve bacteria, bioaccumulation, biostimulatory substances, color, dissolved oxygen, floating material, oil and grease, population and community ecology, pH, radioactivity, salinity, sediment, settleable material, suspended material, sulfide, taste and odor, temperature, toxicity, turbidity, and unionized ammonia.

Beneficial uses are critical to water quality management in California. According to state law, the beneficial uses of California's water that may be protected against quality degradation include, but are not limited to, "domestic, municipal, agricultural and industrial supply, power generation, recreation, aesthetic enjoyment, navigation, and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves" (Water Code Section 13050). Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning.

The Basin Plan identifies beneficial uses for water bodies within its jurisdiction. Runoff from the BART Extension Alternative area would drain into storm drainage systems of Santa Clara and San Jose. Existing and potential beneficial uses for water bodies in the BART Extension Alternative limits are listed in Table 4.17-3.

Table 4.17-3: Existing and Potential Beneficial Uses

Water Body	MUN	FRSH	GWR	COMM	COLD	MIGR	RARE	SPWN	WARM	WILD	REC-1	REC-2
Coyote Creek			E	E	E	E	E	E	E	E	E	E
Lower Silver Creek									E	E	E	E
Guadalupe River			E		E	E	E	E	E	E	E	E
Los Gatos Creek	E	E	E		E	P	E	P	E	E	E	P

SOURCE: San Francisco Bay Regional Water Quality Control Board 2015.

MUN = municipal and domestic supply
 FRSH = freshwater replenishment
 GWR = groundwater recharge
 COMM = commercial and sport fishing
 MIGR = fish migration
 RARE = preservation of rare and endangered species
 SPWN = fish spawning

WARM = warm freshwater habitat
 WILD = wildlife habitat
 REC-1 = water contact recreation
 REC-2 = noncontact water recreation
 E = existing beneficial use
 P = potential beneficial use

The Basin Plan identifies general narrative and numerical water quality objectives for the region.

Existing Water Quality

The BART Extension Alternative site is located within in developed areas of the Cities of San Jose and Santa Clara. The majority of the ground surface is covered by pavement (roads and parking lots) and structures (office and commercial buildings).

Common sources of stormwater pollution in urban areas include construction sites, parking lots, large landscaped areas, and household and industrial sites. Street surfaces are the primary source of pollutants in stormwater runoff in urban areas. Grease, oil, hydrocarbons, and metals deposited by vehicles and heavy equipment can accumulate on streets and paved parking lots and be carried into storm drains by runoff.

Polychlorinated biphenyls (PCBs) are listed as 303(d) impairments in the Lower San Francisco Bay. PCBs can be found in automobile engines and other common items in urban areas. In addition, pesticides, herbicides, fungicides, and fertilizers for landscape maintenance can be washed into storm drains when irrigation exceeds the rate of soil infiltration and plant uptake or when these chemicals are applied in excess. Grading and earthmoving activities associated with new construction can accelerate soil erosion.

Table 4.17-4 shows 303(d)-listed impairments for Coyote Creek, Lower Silver Creek, and the Guadalupe River, based on the 2010 California Integrated Report (State Water Resources Control Board 2011). As shown in the table, diazinon, a pesticide; trash; and mercury are listed as 303(d) impairments in water bodies within the BART Extension Alternative area. Paints, solvents, soap products, and other toxic materials may be inadvertently or deliberately deposited in storm drains in residential and industrial areas. Trash can threaten aquatic life

and recreational beneficial uses designated by the Basin Plan. Trash and litter can collect in storm drain inlets and ultimately be discharged into nearby waterways.

Table 4.17-4: 303(d)-Listed Water Bodies

Water Body	Pollutant	Expected TMDL Completion Date	EPA TMDL Approved Date	Potential Sources
Coyote Creek	Diazinon		5/16/2007	Urban runoff/storm sewers
	Trash	2021		Illegal dumping
	Trash	2021		Urban runoff/storm sewers
Lower Silver Creek	Trash	2021		Urban runoff/storm sewers
	Trash	2021		Illegal dumping
Guadalupe River	Diazinon		5/16/2007	Urban runoff/storm sewers
	Mercury	2008		Mine tailings
	Trash	2021		Urban runoff/storm sewers
	Trash	2021		Illegal dumping

EPA = U.S. Environmental Protection Agency; TMDL = total maximum daily load
 SOURCE: State Water Resources Control Board 2011.

The receiving water bodies ultimately discharge into the South San Francisco Bay, which is identified on the 303(d) list for the region (see Table 4.15-5 for listed pollutants).

Table 4.17-5: 303(d)-Listed Water Body – South San Francisco Bay

Water Body	Pollutant	Expected TMDL Completion Date	EPA TMDL Approved Date	Potential Sources
San Francisco Bay, South	Chlordane	2013		Nonpoint source
	DDT	2013		Nonpoint source
	Dieldrin	2013		Nonpoint source
	Dioxin compounds (including 2,3,7,8-TCDD)	2019		Atmospheric deposition
	Furan Compounds	2019		Atmospheric deposition
	Invasive Species	2019		Ballast water
	Mercury		2/29/2008	Nonpoint source
	Mercury		2/29/2008	Municipal point sources
	Mercury		2/29/2008	Industrial point sources
	Mercury		2/29/2008	Atmospheric deposition
	Mercury		2/29/2008	Natural sources
	Mercury		2/29/2008	Resource extraction
	PCBs	2008		Unknown nonpoint source
	PCBs (dioxin-like)	2008		Unknown nonpoint source
Selenium	2019		Domestic use of groundwater	

DDT = dichlorodiphenyltrichloroethane

Groundwater

In Santa Clara County, almost half of all water used comes from groundwater. In general, groundwater quality in the Santa Clara Valley is good. Throughout most of the region, groundwater quality is suitable for most urban and agricultural uses, with the exception of a few local impairments.

Designated beneficial uses identified for the Santa Clara Valley groundwater basin include municipal and domestic water supply (MUN), industrial process water supply (PROC), and industrial service water supply (IND).

Under existing law, the San Francisco Bay Regional Water Quality Control Board regulates waste discharges to land that could affect water quality, including both groundwater and surface water quality. Waste discharges that reach groundwater are regulated to protect both groundwater and any surface water in continuity with groundwater. Waste discharges that affect groundwater and are in continuity with surface water cannot cause violations of any applicable surface water standards. In July 2012, the Santa Clara Valley Water District (SCVWD) Board of Directors approved the 2012 Groundwater Management Plan, which describes SCVWD's groundwater basin management objectives.

Groundwater Quality

Groundwater contamination can be the result of historical industrial activities, soil contamination, or underground storage tank releases of hazardous materials. According to GeoTracker, leaking underground storage tank cleanup sites are found along the BART Extension, which has a history of soil contamination. A Department of Toxic Substances Control (DTSC) cleanup site is located within the study area (State Water Resources Control Board 2015a).

Baseline Environmental Consulting prepared initial site assessment, which characterized groundwater contamination within the BART Extension Alternative area. The assessment listed 12 known hazardous material release sites and 11 potential hazardous materials that could affect the soil and/or groundwater within the BART Extension Alternative limits. Groundwater monitoring results show that water quality ranges from good to excellent for all major zones in the Santa Clara Basin. In general, contaminants are not detected. However, in some areas, groundwater that has been contaminated by hazardous material releases has spread underneath the railroad corridor. SCVWD has been largely successful in its efforts to prevent groundwater overdraft, curb land subsidence, and protect water quality (WRECO 2016a)

4.17.2.3 Regulatory Setting

The federal regulations discussed below are applicable to the study area. Executive Order (EO) 13690, which amends EO 11988, Floodplain Management, directs all federal agencies to avoid conducting, allowing, or supporting construction in the base floodplain. EO 13690 also directs federal agencies to take action to reduce the risk of flood loss; minimize the

impact of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by the floodplain. The primary federal law for regulating water quality is the federal Clean Water Act (CWA). The U.S. Environmental Protection Agency (EPA) has delegated enforcement of the CWA in California to the State Water Resources Control Board (State Water Board) and its nine Regional Water Quality Control Boards (Regional Water Boards). All BART Extension-related activities need to be in compliance with, at a minimum, the CWA, the California Water Code's Porter-Cologne Water Quality Control Act (Porter-Cologne Act), and the Basin Plan (San Francisco Bay Regional Water Quality Control Board 2015). Chapter 6, Section 6.15, *Water Resources*, provides further details regarding state and local regulations related to water resources.

Federal

Clean Water Act

Several sections of the CWA pertain to regulating impacts on waters of the United States. The CWA sections discussed below pertain to the BART Extension. The term *waters of the United States* essentially refers to all surface waters, such as navigable waters and their tributaries, all interstate waters and their tributaries, all wetlands adjacent to these waters, and all impoundments of these waters. The EPA is the overarching authority for protecting the quality of waters of the United States. However, the State Water Board regulates waters of the United States and State under CWA Sections 303, 401 and 402, and the U.S. Army Corps of Engineers (USACE) has jurisdiction over waters of the United States under CWA Section 404.

CWA Sections 303 and 402 apply to the BART Extension because of potential effects on water quality. CWA Sections 404 and 401 apply to wetlands and other waters of the United States and are not discussed further because the BART Extension would not involve work within water features.

Section 303—Impaired Waters

The state of California adopts water quality standards to protect beneficial uses of waters of the state, as required by Section 303(d) of the CWA and the Porter-Cologne Act. Section 303(d) of the CWA established the total maximum daily load (TMDL) process to guide the application of state water quality standards (refer to the discussion of state water quality standards below). To identify candidate water bodies for TMDL analysis, a list of water quality-limited segments was generated by the State Water Board. These stream or river segments are impaired by the presence of pollutants such as sediment and are more sensitive to disturbance because of this impairment.

In addition to the impaired water body list required by CWA Section 303(d), CWA Section 305(b) requires states to develop a report for assessing statewide surface water quality. Both CWA requirements are being addressed through development of a 303(d)/305(b) Integrated Report, which will address both an update to the 303(d) list and a 305(b) assessment of statewide water quality. The State Water Board developed the statewide 2010 California

Integrated Report, which was based on the integrated reports from each of the nine Regional Water Boards. The 2010 California Integrated Report was approved by the State Water Board on August 4, 2010, and approved by EPA on November 12, 2010. The 2012 California Integrated Report with 303(d) listings was adopted by the State Water Board on April 8, 2015 (Resolution 2015-0021).

Drainage from the BART Extension Alternative area ultimately discharges into the San Francisco Bay. The 303(d)-listed impairments for the Lower San Francisco Bay are shown in Table 4.17-3.

Section 402—National Pollutant Discharge Elimination System

The 1972 amendments to the federal Water Pollution Control Act established the National Pollutant Discharge Elimination System (NPDES) permit program to control discharges of pollutants from point-source discharges, or discharges that one can point to as a known source of pollutants. NPDES is the primary federal program that regulates point-source and nonpoint-source discharges to waters of the United States.

The 1987 amendments to the CWA created a new CWA section, which is devoted to stormwater permitting (Section 402). EPA has granted the state of California primacy in administering and enforcing the provisions of the CWA and NPDES within state boundaries.

NPDES permits are issued by one of the nine Regional Water Boards. Section 402(p) requires permits for discharges of stormwater from industrial, construction, and Municipal Separate Storm Sewer Systems (MS4s). The following NPDES permits are relevant to the BART Extension Alternative:

- San Francisco Bay Municipal Regional Permit (for City owned areas)
- Small Municipal Separate Storm Sewer System General Permit (for VTA property)
- Construction General Permit
- Industrial General Permit (for Newhall Maintenance Facility)
- Utility Vault and Dewatering Permit (for operations as needed)

San Francisco Bay Municipal Regional Permit

This permit ensures attainment of applicable water quality objectives and protection of the beneficial uses of receiving waters and associated habitat and applies to City-owned areas that may be impacted by the BART Extension. This permit requires that discharges shall not cause exceedances of water quality objectives nor shall they cause certain conditions to occur that create a condition of nuisance or water quality impairment in receiving waters.

Accordingly, the State Water Board is requiring that these standard requirements be addressed through the implementation of technically and economically feasible control measures to reduce pollutants in stormwater discharges to the maximum extent practicable as provided in section 402(p) of the CWA. In addition, this permit contains water quality-based effluent limitations to implement TMDLs. Compliance with the Discharge Prohibitions,

Receiving Water Limitations, and Provisions of this permit is deemed compliance with the requirements of this permit. If these measures, in combination with controls on other point and nonpoint sources of pollutants, do not result in attainment of applicable water quality objectives, the State Water Board may invoke Provision C.1 and C.18 to impose additional conditions that require implementation of additional control measures.

Each of the Permittees is individually responsible for adoption and enforcement of ordinances and policies, for implementation of assigned control measures or best management practices (BMPs) needed to prevent or reduce pollutants in stormwater, and for providing funds for the capital, operation, and maintenance expenditures necessary to implement such control measures/BMPs within its jurisdiction. Each Permittee is also responsible for its share of the costs of the area-wide component of the countywide program to which the Permittee belongs. Enforcement actions concerning non-compliance with the permit will be pursued against individual Permittee(s) responsible for specific violations of the permit.

Small Municipal Separate Storm Sewer Systems General Permit

The State Water Board's Waste Discharge Requirements for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (General Permit) (Order No. 2013-0001-DWQ [Phase II MS4 Permit]) regulates stormwater discharges from municipalities and agencies that are not covered under an individual MS4 permit or Phase I MS4 permit. The State Water Board has identified VTA and BART as non-traditional small MS4s that are covered under the Phase II MS4 Permit. The State Water Board or the Regional Water Board issues NPDES permits for 5 years; permit requirements remain active until a new permit has been adopted.

Construction General Permit

The State Water Board's NPDES Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Order No, 2009-0009-DWQ, as amended by subsequent orders), or commonly known as the Construction General Permit (CGP), regulates stormwater discharges from construction sites that result in a disturbed soil area of 1 acre or greater. For all projects that are subject to the CGP, applicants are required to develop and implement an effective Stormwater Pollution Prevention Plan (SWPPP). The SWPPP must list BMPs that the discharger will use to protect stormwater runoff and document the placement and maintenance of those BMPs. Additionally, the SWPPP must contain a visual monitoring program; a chemical monitoring program for "non-visible" pollutants, to be implemented in case of a BMP failure; and a monitoring plan for turbidity and pH for projects that meet defined risk criteria (State Water Resources Control Board 2015b). The requirements of the SWPPP are based on the construction design specifications detailed in the final design plans for a project and the hydrology and geology expected to be encountered during construction. The local or lead agency requires proof of coverage under the CGP prior to issuance of the building permit. The SWPPP is submitted

to the State Water Board, and a copy is kept at the jobsite where it is updated during different phases of construction.

The CGP separates projects into risk levels 1, 2, or 3. The determination of risk level is based on the potential for erosion and sediment transport to receiving waters. Requirements are applied according to the risk level determined. Because the area of land disturbance would be greater than 1 acre, a CGP would be required for activities.

It was determined that all four watersheds, Coyote Creek, Lower Silver Creek, Los Gatos, and the Guadalupe River, were risk level 2 and therefore subject to temporary construction site BMP implementation and visual monitoring requirements. Additionally, risk level 2 projects are subject to Numeric Action Levels for pH and turbidity associated with stormwater runoff. The BART Extension risk levels will be further evaluated and verified during the plans, specifications, and estimate phase.

Industrial General Permit

The State Water Board and Regional Water Boards regulate all specified industrial activities under the Waste Discharge Requirements for Discharges of Stormwater Associated with Industrial Activities, Excluding Construction Activities (Industrial General Permit, State Water Board Order No. 97-03-DQ, NPDES General Permit No. CAS000001). On April 1, 2014, the State Water Board adopted the new statewide Industrial General Permit (WQO No. 2014-0057-DWQ), which became effective on July 1, 2015, and supersedes the existing Industrial General Permit (97-03-DWQ). The Industrial General Permit requires the implementation of management measures that achieve the performance standard of best available technology economically achievable (BAT) and best conventional pollutant control technology (BCT). The Industrial General Permit also requires development of a SWPPP and a monitoring plan. Through the SWPPP, sources of pollutants are identified, and the means for managing the sources and reducing stormwater pollution are described. Any Industrial General Permit noncompliance constitutes a violation of the CWA and the Porter-Cologne Act and is grounds for (a) enforcement action; (b) Industrial General Permit termination, revocation and reissuance, or modification; or (c) denial of an Industrial General Permit renewal application. The BART Extension would be a Category 8 industrial discharger because of the associated maintenance facilities (Category 8 includes transportation facilities that conduct any type of vehicle maintenance, such as fueling, cleaning, repairing, etc.) and therefore subject to conditions of the Industrial General Permit.

Utility Vault and Dewatering Permit

This permit is intended to authorize short-term intermittent discharges of pollutants to surface waters from dewatering of utility vaults and underground structures. The BART Extension would likely involve dewatering of vaults during operations. To be covered, discharges must meet the following criteria: pollutant concentrations in the discharge do not cause, have a reasonable potential to cause, or contribute to an exceedance in a receiving water of any applicable criterion established by the EPA pursuant to CWA Section 303; pollutant

concentrations in the discharge do not cause, have a reasonable potential to cause, or contribute to an exceedance in a receiving water of any water quality objective adopted by the State Water Board or Regional Water Boards including prohibitions of discharge for the receiving water; and the discharge does not cause acute or chronic toxicity in the receiving water.

National Flood Insurance Program

In response to increasing costs of disaster relief, Congress passed the National Flood Insurance Act (NFIP) of 1968 and the Flood Disaster Protection Act of 1973. FEMA administers the NFIP to provide subsidized flood insurance to communities that comply with FEMA regulations to limit development in floodplains. A FIRM is the official FEMA-prepared map of a community; it delineates both the special flood hazard areas and flood risk premium zones that are applicable to the community.

The BART Extension Alternative contains all FEMA-designated flood zones (i.e., zones AE, AO, A, AH, D, X [shaded], and X [unshaded]). More information is provided in Section 4.17.2.1, *Environmental Setting*.

4.17.3 Methodology

For the analysis of impacts on hydrology and water resources, an *adverse effect* determination means the BART Extension would contribute to a violation of regulatory standards or an exceedance of the capacity of existing facilities.

4.17.4 Environmental Consequences and Mitigation Measures

This section identifies impacts and evaluates whether they would be adverse according to the National Environmental Policy Act (NEPA), using the criteria (i.e., context and intensity) identified in Section 4.17.3, *Methodology*. This section also identifies design commitments, BMPs, and other measures to avoid, minimize, or mitigate impacts.

4.17.4.1 No Build Alternative

The No Build Alternative consists of the existing transit and roadway networks and planned and programmed improvements (see Chapter 2, Section 2.2.1, *NEPA No Build Alternative*, for a list of these projects). Under the No Build Alternative, the effects of the current built environment on surface waters would continue, including effects from continued operation of roads, transit vehicles, highways, and transit facilities. Higher vehicle traffic is expected, which could degrade water quality because of increased pollutants in stormwater from roadways and associated vehicular use. Projects planned under the No Build Alternative would most likely include BMPs to reduce pollutants from stormwater runoff that are consistent with the Santa Clara Valley Urban Runoff Pollution Prevention Program NPDES permits, the NPDES General Industrial Stormwater Permit, MS4 permits, and/or General

Waste Discharge Requirements. Projects under the No Build Alternative would be designed in accordance with regulatory requirements and agency criteria from FEMA, SCVWD criteria and engineering guidelines, and the municipal codes of the local cities. Projects planned under the No Build Alternative would undergo separate environmental review to define effects on water resources and quality.

4.17.4.2 BART Extension Alternative

Potential impacts on water resources (i.e., surface waters, groundwater, floodplains) and water quality are discussed below. Potential erosion impacts are also discussed because they have the potential to affect the BART Extension.

Surface Waters

Surface water quality may be affected by polluted stormwater runoff from station areas, parking lot structures, kiss-and-ride facilities, access roads, the Newhall Maintenance Facility, and other sites that have impervious surfaces. Runoff from impervious surfaces could contain nonpoint-source pollution, which is typical of urban settings and commonly associated with automobiles, trash, cleaning solutions, and landscaped areas. Grease, oil, hydrocarbons, and metals deposited by vehicles and heavy equipment can accumulate on streets and paved parking lots and be carried into storm drains by runoff. Stormwater would be drained by a combination of new and existing pipes, drainage inlets, and other storm drain facilities. Runoff from the BART Extension would be conveyed to local storm drain systems and ultimately to South San Francisco Bay.

The BART Extension would be designed in accordance with the Phase II MS4 Permit, Section F.5.g, for post-construction stormwater management. BART would operate the system in accordance with the Phase II MS4 Permit for the guideway and systems and other facilities that they would be operating. VTA would apply the MS4 Permit for the station campuses and other facilities where BART is not the operator.

VTA developed a *Stormwater and Landscaping Design Criteria Manual* (effective June 30, 2015) to assist VTA engineers with incorporating the post-construction stormwater requirements of the small MS4 permit into VTA operated facilities. Following VTA's *Stormwater and Landscaping Design Criteria Manual*, VTA would implement BMPs and post-construction stormwater treatment measures because the BART Extension would replace or create more than 5,000 square feet of impervious surfaces. The criteria and standards are similar to those of the Santa Clara Valley Urban Runoff Pollution Prevention Program guidelines. Stormwater treatment designs would preferentially utilize site design measures, source-control BMPs, and Low-Impact Development (LID) treatment features. Generally, the LID measures would include vegetative improvements, which must comply with VTA's Sustainable Landscaping Policy.

To minimize any adverse effects on water quality due to stormwater runoff, stormwater management measures are included as part of the design. These would utilize LID techniques to reduce pollutant discharges and BMPs to reduce pollutants from stormwater runoff, consistent with VTA's *Stormwater and Landscaping Design Criteria Manual*, the Santa Clara Valley Urban Runoff Pollution Prevention Program stormwater handbook, City of San Jose and Santa Clara NPDES permits, MS4 permits, and/or General Waste Discharge Requirements as applicable. In the design phase, specifications and design details would be further developed to include site-specific source control, LID, and post-construction stormwater treatment measures.

A new drainage system may be required to capture stormwater throughout the BART Extension Alternative area. The drainage system may include detention basins, which detain water temporarily to reduce peak discharges before slowly releasing the water to the storm sewer system by gravity flow. Regardless of whether water is released to the storm sewer system through the detention basins or through direct discharge, the BART Extension would comply with applicable NPDES and/or MS4 permit requirements and include BMPs to reduce pollutants from stormwater runoff. In addition, BMPs and LID measures would be implemented to minimize erosion, siltation, and/or flooding (WRECO 2016a).

No effects on surface waters are anticipated because of the depth of the tunnels, which would be constructed below the water table, at an average depth of 40 feet below ground at the crown (i.e., top of the tunnel) for the Twin-Bore Option and an average depth of 70 feet below ground at the crown for the Single-Bore Option. The track alignment would be underground until the End-of-the-Line Maintenance Yard. The Twin-Bore Option would pass approximately 25 feet below Coyote Creek, under the retaining wall at the Guadalupe River (at the lowest point in the tunnel alignment, approximately 45 feet below the Guadalupe River), and approximately 20 feet below Los Gatos Creek (WRECO 2016a).

Under the Phase II MS4 Permit, the BART Extension Alternative would be required to use BMPs and permanent erosion control measures because it would replace or create more than 5,000 square feet of impervious surfaces. With application of the Phase II MS4 Permit, the BART Extension Alternative would not contribute any detectable concentrations of diazinon or mercury to any watercourses within the study area that have been identified as impaired by the Regional Water Board, pursuant to Section 303(d) of the federal CWA. The BART Extension Alternative would not violate water quality standards or waste discharge requirements or provide substantial additional sources of polluted runoff. *No adverse effect* related to surface waters would result. No mitigation is required.

Groundwater

The BART Extension would add approximately 44.99 net acres of impervious area (WRECO 2016a). Compared with existing conditions, the increase in impervious areas at the stations, structured parking, kiss-and-ride facilities, and other sites would be limited. These sites are already developed and therefore would have minimal adverse effect on groundwater

recharge. However, to facilitate groundwater recharge, if necessary, engineered methods that either allow for infiltration or reduce impervious cover would be included in the BART Extension design.

Dewatering would be necessary inside retained cuts, underground stations, and tunnels during operations to keep the facilities dry. The quantity of water to be removed is anticipated to be minimal, and no detectable changes to the groundwater supply would occur. The retained cuts and underground stations would be designed to prevent water intrusion, and the tunnels would be sealed. Landscape design features at station areas and potentially the BART trackways that are being considered include planting native, drought-resistant plants; using low-flow fixtures; increasing pervious surfaces with use of porous paving and unit pavers; capturing surface flow with bioretention basins and rain gardens, and using soil-water separators and other filters.

A dewatering plan would be required as part of the Contractor's SWPPP for any dewatering proposed up to 10,000 gallons per day. Water quality sampling and analysis would be required prior to any discharge into the sanitary sewer, storm drainage system, or downstream receiving water bodies. For areas of known contamination and where pumping will exceed 10,000 gallons per day, the CGP may not be used for dewatering, and a separate NPDES permit for Structural Dewatering, VOC contaminated groundwater, and/or a project-specific Waste Discharge Requirements (WDR) permit would be needed to address potential contamination of groundwater and treatment needed prior to discharge.

Tunnel structures and underground stations may affect groundwater flow direction and pathways, resulting in the diversion of the normal flow of groundwater, the mounding of groundwater upgradient of the aforementioned facilities, or a localized rise in the water table. To minimize these adverse effects, highly permeable gravel channels and/or slotted PVC pipes would be placed in areas where water would be routed around a sealed tunnel to minimize effects on groundwater paths and directions. In addition, tunnels would be constructed below the water table, at a minimum depth of 20 feet below ground at the tunnel crown (WRECO 2016a). Therefore, groundwater would be able to flow above and below the tunnel structure, and the mounding of groundwater upgradient from the tunnel structure is not anticipated. If any fill material this is placed during construction fails to provide adequate permeability, additional drainage design features could be applied.

The BART Extension would comply with the SCVWD 2012 *Groundwater Management Plan*. The BART Extension would not affect groundwater supply and would have minimal effects on groundwater recharge. It would not alter groundwater flow directions or pathways. There would be *no adverse effect* on groundwater. No mitigation is required.

Floodplains

Several areas in the vicinity of the alignment crossing for the Alum Rock/28th Street Station are within the base floodplain. Ground parking, system facilities, and station entrances and roadway improvements are entirely within the floodplain of Coyote Creek/Lower Silver Creek

and occupy a total of approximately 9.25 acres. However, the BART Extension Alternative would remove adjacent buildings that currently occupy approximately 2.77 acres and are also entirely within the same floodplain. The station improvements would add approximately 2.54 acres of added impervious area (AIA) to the floodplain area. The removal of structures (light industrial warehouses) helps with the reducing/offsetting floodplain risk. In addition, it is anticipated that the roadway improvements would not significantly change the existing grade. The Alum Rock/28th Street Station is located within Zone AH, with a base flood elevation of 89 feet (NAVD) and a Zone AO depth of 1 foot. Station features would have a floor elevation of 2 to 3 feet above the base flood elevation, depending on whether the feature is deemed non-critical or critical per Executive Order 13690. Critical facilities such as traction power substations, gap breaker stations, train control and communication buildings, and vent shaft openings, would be set above the 0.2 percent annual storm event. Minimization measures at this station would include balancing pre-fill and post-fill in the floodplain to minimize the amount of fill and prevent flood storage from being lost. Balancing the pre-fill and post-fill would result in *no effect* because flooding would not be exacerbated as a result of the project. The floodflow pattern would be maintained as much as possible by incorporating and providing a flow-through area in the station campus, especially in the parking areas. Storage and detention would be implemented as necessary to make up for storage lost as a result of the BART Extension (WRECO 2016b).

The area of the structures within the base floodplain is insignificant compared with the overall floodplain area for Coyote Creek/Lower Silver Creek (approximately 28,160 acres). Therefore, the BART Extension Alternative would not significantly change the base floodplain water surface elevation (WSE) at Alum Rock/28th Street Station. Although there would be fill in the floodplain as a result of the Alum Rock/28th Street Station, with the minimization measures mentioned above, such as balancing the fill and storage capacity and providing a flow-through area to ensure floodflow is maintained, mitigation measures will not be required (WRECO 2016b). Therefore, floodplain impacts as a result of the BART Extension Alternative would be minimal at Alum Rock/28th Street Station. In addition, after completion of work at all six reaches of the Lower Silver Creek Flood Protection Project, SCVWD and the City of San Jose will be able to demonstrate to FEMA that all homes and businesses that are subject to a 1 percent annual chance flood from Lower Silver Creek have been protected.

The BART Extension would be designed to withstand 10 percent annual storm events, and specific facilities would be designed to withstand 1 percent and 0.2 percent annual storm events, as required by *BART Facility Standards* (Bay Area Rapid Transit 2011). In addition, the design of critical facilities would comply with Executive Order 13690.

The Newhall Maintenance Facility is a critical facility and would be designed in accordance with the standards and requirements for critical facilities. The Newhall Maintenance Facility would add approximately 2.16 acres of structures, and the AIA would be 41.86 acres, within Zones D and Zone X (shaded). These areas are not considered a base floodplain. According to the *Hydraulic Study* (WRECO 2016b), critical facilities, including traction power, train

control, and communications buildings, are to be set a minimum of 1 foot above the 0.2 percent WSE, with an overland flood release path that ensures that no more than 1 foot of ponding can develop. The Newhall Maintenance Facility would not be located within any base floodplain. Therefore, there would be *no effect* on floodplains as a result of the BART Extension Alternative at this location. Mitigation is not required.

Some of the station options (Alum Rock/28th Street Station, Downtown San Jose Station East Option and Downtown San Jose West Option, and Diridon Station South Option and Diridon Station North Option) would be underground and therefore would not extend into floodplain. The Downtown San Jose Station East Option would add 0.72 acre of structures, such as system facilities and transit plazas, and 0.10 acre of AIA. The Downtown San Jose Station West Option would add approximately 0.40 acre of structures, such as system facilities and transit plazas, and 0.03 acre of AIA. However, the BART Extension Alternative would remove adjacent buildings that currently occupy approximately 0.16 acre. There would be approximately 0.24 acre of additional building structures within Zone D. Within Zone D, flooding is undetermined but possible; this zone is not considered an SFHA or a base floodplain. The station would not be located within any base floodplain. The Diridon Station South Option would add approximately 1.08 acres of structures, such as system facilities and transit plazas (station entrances). However, the BART Extension Alternative would remove adjacent buildings that currently occupy approximately 0.21 acre. The AIA to this station is negligible (WRECO 2016b). The Diridon Station North Option would add acreage similar to the Diridon Station South Option.

The track alignment would not encroach upon any base floodplains because it would not be within any base floodplain areas or would be underground within a bored tunnel. As a result, there would be *no effect* on the base floodplain, and there would be no floodplain effects as a result of the BART Extension Alternative. Mitigation is not required.

The Santa Clara Station would be aboveground and would add approximately 4.61 acres of structures in Zone X (shaded, an area of moderate flood hazard) and approximately 0.46 acre of AIA to the floodplain. However, the BART Extension would remove the adjacent building that currently occupies approximately 3.42 acres, which is also entirely within the same floodplain. Localized and temporary flooding and ponding may result in areas with added impervious cover during storm events. The station would not be located within any base floodplain. Therefore, there would be *no adverse effect* in terms of the floodplain as a result of the BART Extension at this location. Mitigation is not required.

The BART Extension would not change the land use of the study area. Currently, all of the BART Extension Alternative area within the floodplain is developed, partially developed, or zoned for development. Some of the projected base floodplain development would occur regardless of the BART Extension. In general, the BART Extension would be consistent with development plans for the area and would not significantly change the land use in the area because it is currently developed or zoned for development. The base floodplain impacts as a result of the BART Extension are summarized in Table 4.17-6.

Table 4.17-6: Summary of Base Floodplain Impacts

BART Extension Alternative Element	Flood Hazard Zone	Impervious Area per Feature (ac)	Total Impervious Area (ac)	Added Impervious Area (ac)	Existing Building to be Removed	Impacts	Watershed	Watershed Drainage Area (ac)	Increase Area to Watershed (ac)	Notes
Mabury Road CSA	AE/AE (Floodplain)	4.29	25.25	--	0.00	Minimal	Coyote Creek	158,080	N/A	
	AH	20.96		--	3.74	Minimal				
Alum Rock CSA	A/AH/AO	0.71	9.96	--	0.00	Minimal	Lower Silver Creek ^a	28,160	0.01%	1
Alum Rock/28 th Street Station	AH/AO	9.25	48.62	2.54	2.77	Minimal				
Downtown San Jose Station East Option	D	0.77		0.01	0.00	No Impact	Guadalupe River ^b	92,160	0.05%	2
Downtown San Jose Station West Option	D	0.40		0.03	0.16	No Impact				
Newhall Maintenance Facilities	D/X (Shaded)	43.86		41.86	0.00	No Impact				
Santa Clara Station	X (Shaded)	3.59		0.46	3.42	No Impact				
Diridon Station (South and North Options)	D	3.47	3.47	Negligible	0.21	No Impact	Los Gatos Creek	35,072	N/A	

^a Improvements to Lower Silver Creek by SCVWD and the Natural Resources Conservation Service could result in changes to the FIRM.
^b Improvements to Guadalupe River by the USACE and SCVWD could result in changes to the FIRM.
 ac = acres; CSA = Construction Staging Area

The change in WSE would be minimal because there would be minimal fill in the base floodplains with proper minimization measures (WRECO 2016b). The BART Extension would not expose people or structures to the risk of flooding, create floodplains, or result in an increase in the base flood elevation. Natural and beneficial floodplain values would not be affected by the BART Extension. In addition, the BART Extension Alternative would not create or contribute runoff that would exceed the capacity of existing or planned drainage systems. There would be *no adverse effect*. No mitigation is necessary.

4.17.5 NEPA Conclusion

The BART Extension Alternative would not expose people or structures to the risk of flooding, create floodplains, or result in an increase in the base flood elevation. The BART Extension Alternative would result in *no adverse effect* on water resources. With the implementation of minimization measures and measure in compliance with regulations, the BART Extension would result in *no adverse effect*. No additional mitigation is required.

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