APPENDIX 3.8-C: BASIN PLAN WATER QUALITY IMPACT ASSESSMENT

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Since publication of the Draft Environmental Impact Report (EIR)/Environmental Impact Statement (EIS), the following substantive change has been made to this appendix:

- Updates to reflect revisions to project impacts on aquatic resources within the San Francisco to San Jose Subsection.

This Volume 2 technical appendix compiles information regarding the existing surface water quality conditions for aquatic resources in the project footprint as documented in the San Francisco Bay Regional Water Quality Control Board's (San Francisco Bay RWQCB) Basin Plan (San Francisco Bay RWQCB 2017). This appendix also summarizes potential impacts on each aquatic resource by project alternative according to Section 3.8, Hydrology and Water Resources, of this Final EIR/EIS. The purpose of this appendix is to summarize impacts on aquatic resources and Basin Plans to inform the Clean Water Act Section 401 Water Quality Certification.

Beneficial Uses in the Resource Study Area

Most of the aquatic resources within the surface water resource study area (RSA) provide both economic and environmental beneficial uses. Economic beneficial uses include agricultural water supply (AGR), commercial and sport fishing (COMM), industrial service supply (IND), navigation (NAV), water recreation (contact [REC-1] and non-contact [REC-2]), and shellfish harvesting (SHELL). Environmental beneficial uses include cold freshwater habitat (COLD), estuarine habitat (EST), freshwater replenishment (FRSH), groundwater recharge (GWR), fish migration (MIGR), preservation of rare and endangered species (RARE), fish spawning (SPWN), warm freshwater habitat (WARM), and wildlife habitat (WILD). Table 1 lists the aquatic resources that have been identified within the RSA in alphabetical order and lists their beneficial uses. It also indicates whether the aquatic resource is within the project footprint.

Table 1 Beneficial Uses in the Resource Study Area by Aquatic Resource and Subsection

Aquatic Resource	Subsection	Existing Beneficial Uses
Adobe Creek	San Mateo to Palo Alto	COLD, WARM, WILD, REC-1, REC-2
Alamitos (Los Alamitos) Creek	Not in project footprint	FRSH, GWR, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2
Alviso Slough	Not in project footprint	EST, MIGR, RARE, WILD, REC-1, REC-2
Anza Lagoon	Not in project footprint	EST, WILD, REC-1, REC-2
Arroyo Ojo de Agua	San Mateo to Palo Alto	WARM, WILD, REC-1, REC-2
Atherton Channel	San Mateo to Palo Alto	WARM, WILD, REC-1, REC-2
Barron Creek	San Mateo to Palo Alto	WARM, WILD, REC-1, REC-2
Bay Front Channel	Not in project footprint	None listed in the Basin Plan. Discharges into San Francisco Bay.
Belmont Creek	San Mateo to Palo Alto	WARM, WILD, REC-1, REC-2
Belmont Slough	Not in project footprint	EST, RARE, SPWN, WILD, REC-1, REC-2
Borel Creek	San Mateo to Palo Alto	WARM, WILD, REC-1, REC-2
Brisbane Lagoon	San Francisco to South San Francisco	EST, WILD, REC-1, REC-2
Brisbane Lagoon Construction Basins	San Francisco to South San Francisco	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.

Aquatic Resource	Subsection	Existing Beneficial Uses
Brisbane Lagoon Saline Wetlands	San Francisco to South San Francisco	Estuarine wetland beneficial uses likely apply: AGR, COMM, EST, GWR, MIGR, NAV, REC-1, REC-2, SHELL, SPWN, WILD, RARE.
Brisbane Wetlands	San Francisco to South San Francisco	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.
Brittan (Arroyo) Creek	San Mateo to Palo Alto	None listed. Beneficial uses of Pulgas Creek apply: WARM, WILD, REC-1, REC-2
Burlingame Creek	San Bruno to San Mateo	None listed in the Basin Plan. Discharges into San Francisco Bay.
Calabazas Creek	Mountain View to Santa Clara	AGR, GWR, COLD, WARM, WILD, REC-1, REC-2
Canoas Creek	Not in project footprint	WARM, WILD, REC-1, REC-2
Cargill Salt Ponds	Not in project footprint	None listed in the Basin Plan.
China Basin Channel / Mission Creek	San Francisco to South San Francisco	COMM, EST, WILD, REC-1, REC-2, NAV
Colma Creek	San Francisco to South San Francisco	WARM, WILD, REC-1, REC-2
Constructed Watercourse 1	San Mateo to Palo Alto	None listed in the Basin Plan.
Cordilleras Creek	San Mateo to Palo Alto	WARM, WILD, REC-1, REC-2
Coyote Creek	Not in project footprint	GWR, COMM, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2
Drainage Ditch 1	San Francisco to South San Francisco	None listed in the Basin Plan.
Drainage Ditch 2 and Wetlands	San Francisco to South San Francisco	None listed in the Basin Plan. Palustrine wetland beneficial uses may apply to the wetlands: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.
Drainage Ditch 3	San Bruno to San Mateo	None listed in the Basin Plan.
Drainage Ditch 4	San Bruno to San Mateo	None listed in the Basin Plan.
Drainage Ditch 5	San Bruno to San Mateo	None listed in the Basin Plan.
Drainage Ditch 6	San Bruno to San Mateo	None listed in the Basin Plan.
Drainage Ditch 7	San Bruno to San Mateo	None listed in the Basin Plan.
Drainage Ditch 8	San Bruno to San Mateo	None listed in the Basin Plan.
Drainage Ditch 9	San Mateo to Palo Alto	None listed in the Basin Plan.
Drainage Ditch 11	San Mateo to Palo Alto	None listed in the Basin Plan.
Drainage Ditch 12	San Mateo to Palo Alto	None listed in the Basin Plan.
Drainage Ditch 13	San Francisco to South San Francisco	None listed in the Basin Plan.

Aquatic Resource	Subsection	Existing Beneficial Uses
Easton Creek	San Bruno to San Mateo	WARM, WILD, REC-1, REC-2
El Camino Storm Drain	Mountain View to Santa Clara	None listed. Beneficial uses of Calabazas Creek apply: AGR, GWR, COLD, WARM, WILD, REC-1, REC-2.
El Portal Canal	San Bruno to San Mateo	None listed in the Basin Plan. Discharges into San Francisco Bay.
El Zanjon	San Bruno to San Mateo	None listed. Beneficial uses of San Bruno Creek apply: WARM, WILD, REC-1, REC-2
Fiesta Creek	San Mateo to Palo Alto	None listed. Beneficial uses of Borel Creek may apply: WARM, WILD, REC-1, REC-2 Palustrine wetland beneficial uses may also apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.
Guadalupe River	San Jose Diridon Station Approach	GWR, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2
Guadalupe Slough	Not in project footprint	EST, RARE, WILD, REC-1, REC-2
Guadalupe Creek	Not in project footprint	FRSH, GWR, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2
Guadalupe Valley Creek	San Francisco to South San Francisco	WARM, WILD, REC-1, REC-2
Guadalupe Valley Creek Saline Wetland	San Francisco to South San Francisco	Estuarine wetland beneficial uses likely apply: AGR, COMM, EST, GWR, MIGR, NAV, REC-1, REC-2, SHELL, SPWN, WILD, RARE.
Hale Creek	Not in project footprint	COLD, WARM, WILD, REC-1, REC-2
Highline Creek	San Bruno to San Mateo	None listed in the Basin Plan. Discharges into San Francisco Bay.
Highline Creek Tributary and Wetlands	San Bruno to San Mateo	None listed in the Basin Plan. Discharges into San Francisco Bay. Palustrine wetland beneficial uses may apply to the wetlands: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.
Islais Creek Channel	San Francisco to South San Francisco	COMM, EST, WILD, REC-1, REC-2, NAV
Laurel Creek	San Mateo to Palo Alto	WARM, WILD, REC-1, REC-2
Laurel Creek Tributary	San Mateo to Palo Alto	None listed. Beneficial uses of Laurel Creek apply: WARM, WILD, REC-1, REC-2.
Laurel Creek Tributary Wetland	San Mateo to Palo Alto	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.
Leslie Creek	San Mateo to Palo Alto	WARM, WILD, REC-1, REC-2
Los Gatos Creek	San Jose Diridon Station Approach	MUN, FRSH, AGR, GWR, COLD, RARE, WARM, WILD, REC-1
Matadero Creek	San Mateo to Palo Alto	COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2

Aquatic Resource	Subsection	Existing Beneficial Uses
Mayfield Slough	Not in project footprint	EST, MIGR, RARE, WILD, REC-1, REC-2
Mills Creek	San Bruno to San Mateo	WARM, WILD, REC-1, REC-2
Mills Creek Tributary Wetland	San Bruno to San Mateo	Beneficial uses of Mills Creek may apply: WARM, WILD, REC-1, REC-2 Palustrine wetland beneficial uses may also apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.
Moffett Channel	Not in project footprint	EST, WILD, REC-1, REC-2
Mountain View Slough	Not in project footprint	EST, RARE, WILD, REC-1, REC-2
Oyster Point Channel	San Francisco to South San Francisco	None listed in the Basin Plan. Discharges into San Francisco Bay.
Palustrine Forested Wetland 6	San Jose Diridon Station Approach	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.
Permanente Creek	Mountain View to Santa Clara	GWR, COLD, RARE, SPWN, WARM, WILD REC-1, REC-2
Polhemus Creek	Not in project footprint	COLD, WARM, WILD, REC-1, REC-2
Prospect Creek	Not in project footprint	None listed. Beneficial uses of Calabazas Creek apply: AGR, GWR, COLD, WARM, WILD, REC-1, REC-2
Pulgas Creek	San Mateo to Palo Alto	WARM, WILD, REC-1, REC-2
Ravenswood Slough	Not in project footprint	EST, RARE, WILD, REC-1, REC-2
Redwood Creek	San Mateo to Palo Alto	WARM, WILD, REC-1, REC-2
Redwood Shores Lagoon	Not in project footprint	None listed in the Basin Plan. Discharges into San Francisco Bay.
Redwood Slough	Not in project footprint	EST, RARE, WILD, REC-1, REC-2, NAV
Regnart Creek	Not in project footprint	None listed. Beneficial uses of Calabazas Creek apply: AGR, GWR, COLD, WARM, WILD, REC-1, REC-2
Ross Creek	Not in project footprint	GWR, WARM, WILD, REC-1, REC-2
San Bruno Creek	San Bruno to San Mateo	WARM, WILD, REC-1, REC-2
San Francisquito Creek	San Mateo to Palo Alto	COLD, MIGR, SPWN, WARM, WILD, REC-1, REC-2
San Mateo Creek	San Bruno to San Mateo	FRSH, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2
San Tomas Aquino Creek	Mountain View to Santa Clara	COLD, RARE, WARM, WILD, REC-1, REC-2
Saline Wetland 1	San Francisco to South San Francisco	Estuarine wetland beneficial uses likely apply: AGR, COMM, EST, GWR, MIGR, NAV, REC-1, REC-2, SHELL, SPWN, WILD, RARE.
Sanchez Creek	San Bruno to San Mateo	WARM, WILD, REC-1, REC-2

Aquatic Resource	Subsection	Existing Beneficial Uses
Sanchez Creek Tributary and Wetland	San Bruno to San Mateo	None listed. Beneficial uses of Sanchez Creek apply: WARM, WILD, REC-1, REC-2 Palustrine wetland beneficial uses may apply to the wetland: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.
Saratoga Creek	Not in project footprint	None listed. Beneficial uses of San Tomas Aquino Creek apply: COLD, RARE, WARM, WILD, REC-1, REC-2
Seal Slough	Not in project footprint	EST, RARE, WILD, REC-1, REC-2
Smith Slough	Not in project footprint	EST, RARE, WILD, REC-1, REC-2
Sobey Creek	Not in project footprint	None listed. Beneficial uses of San Tomas Aquino Creek apply: COLD, RARE, WARM, WILD, REC-1, REC-2
Steinberger Slough	Not in project footprint	EST, RARE, WILD, REC-1, REC-2
Stevens Creek	Mountain View to Santa Clara	FRSH, GWR, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2
Sunnyvale East Channel	Mountain View to Santa Clara	None listed. Beneficial uses of Guadalupe Slough apply: EST, RARE, WILD, REC-1, REC-2.
Thompson Creek	Not in project footprint	WARM, WILD, REC-1, REC-2
Upper Crystal Springs Reservoir	Not in project footprint	None listed. Beneficial uses of San Mateo Creek apply: FRSH, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2
Upper Penitencia Creek	Not in project footprint	FRSH, GWR, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2
Vasona Creek	Not in project footprint	None listed. Beneficial uses of San Tomas Aquino Creek apply: COLD, RARE, WARM, WILD, REC-1, REC-2
Visitacion Creek	San Francisco to South San Francisco	None listed in the Basin Plan. Discharges into San Francisco Bay.
Visitacion Creek Constructed Basin 1	San Francisco to South San Francisco	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.
Visitacion Creek Constructed Basin 2	San Francisco to South San Francisco	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.
Visitacion Creek Constructed Basin 3	San Francisco to South San Francisco	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.
Visitacion Creek Constructed Basin 4	San Francisco to South San Francisco	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.
Visitacion Creek Saline Wetlands	San Francisco to South San Francisco	Estuarine wetland beneficial uses likely apply: AGR, COMM, EST, GWR, MIGR, NAV, REC-1, REC-2, SHELL, SPWN, WILD, RARE.

Aquatic Resource	Subsection	Existing Beneficial Uses
Visitacion Creek Tributary and Wetland	San Francisco to South San Francisco	None listed in the Basin Plan. Discharges into Visitacion Creek. Palustrine wetland beneficial uses may apply to the wetland: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.
Visitacion Creek Wetlands	San Francisco to South San Francisco	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.
Waterdog Lake	Not in project footprint	None listed. Beneficial uses of Belmont Creek apply: WARM, WILD, REC-1, REC-2
Wetland 1	San Francisco to South San Francisco	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.
Wetland 3	San Francisco to South San Francisco	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.
Wetland 4	San Bruno to San Mateo	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.
Wetland 5	San Mateo to Palo Alto	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.
Wetland 6	San Francisco to South San Francisco	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.
Wetland 7	San Francisco to South San Francisco	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.
Wetland 8	San Francisco to South San Francisco	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.
Wetland 9	San Francisco to South San Francisco	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.
Wildcat Creek	Not in project footprint	None listed. Beneficial uses of San Tomas Aquino Creek apply: COLD, RARE, WARM, WILD, REC-1, REC-2

Source: San Francisco Bay RWQCB 2017

AGR = agricultural supply; COLD = cold freshwater habitat; COMM = commercial and sport fishing; EST = estuarine habitat; FRSH = freshwater replenishment; GWR = groundwater recharge; MIGR = fish migration; MUN = municipal and domestic supply; NAV = navigation; RARE = preservation of rare, threatened, or endangered species; REC-1 = water contact recreation; REC-2 = noncontact water recreation; SPWN = fish spawning, reproduction or early development; WARM = warm freshwater habitat; WILD = wildlife habitat

Water Quality Objectives in the Resource Study Area

Water quality objectives are the control and management criteria necessary to preserve the beneficial uses of an aquatic resource or groundwater aquifer. They are measured and analyzed through qualitative and quantitative factors. Tables 2 and 3 describe the surface water and groundwater quality objectives that were developed by the San Francisco Bay RWQCB to protect the existing beneficial uses of surface water and groundwater within the RSA.

Table 2 Surface Water Quality Objectives

Parameter	Surface Water Quality Objective
San Francisco Bay RWQCB	
Bacteria	Water quality objectives for bacteria in Table 3-1 of the basin plan shall be strictly applied except when otherwise provided for in a TMDL.
Bioaccumulation	Controllable water quality factors shall not cause a detrimental increase in concentrations of toxic substances found in bottom sediments or aquatic life.
Biostimulatory Substances	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.
Color	Waters shall be free of coloration that causes nuisance or adversely affects beneficial uses.
Dissolved Oxygen	In waters with the beneficial use of COLD, dissolved oxygen may not be depressed below 7.0 milligrams per liter. In waters with the beneficial use of WARM, dissolved oxygen may not be depressed below 5.0 milligrams per liter. The basin plan also contains dissolved oxygen objectives for tidal waters.
Floating Materials	Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.
Oil and Grease	Waters shall not contain oils, greases, waxes, or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance, or that otherwise adversely affect beneficial uses.
Population and Community Ecology	All waters shall be maintained free of toxic substances in concentrations that are lethal to or that produce significant alterations in population or community ecology or receiving water biota. In addition, the health and life history characteristics of aquatic organisms in waters affected by controllable water quality factors shall not differ significantly from those for the same waters in areas unaffected by controllable water quality factors.
pH	The pH shall not be depressed below 6.5 nor raised above 8.5. This encompasses the pH range usually found in waters within the basin. Controllable water quality factors shall not cause changes greater than 0.5 units in normal ambient pH levels.
Radioactivity	Radionuclides shall not be present in concentrations that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life. Waters designated with the beneficial use of MUN shall not contain concentrations of radionuclides in excess of the limits specified in Table 4 of Section 64443 (Radioactivity) of Title 22 of the California Code of Regulations.
Salinity	Controllable water quality factors shall not increase the total dissolved solids or salinity of waters of the state so as to adversely affect beneficial uses, particularly fish migration and estuarine habitat.

Parameter	Surface Water Quality Objective
Sediment	The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses. Controllable water quality factors shall not cause a detrimental increase in the concentrations of toxic pollutants in sediments or aquatic life.
Settleable Material	Waters shall not contain substances in concentrations that result in the deposition of material that cause nuisance or adversely affect beneficial uses.
Suspended Material	Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.
Sulfide	All water shall be free from dissolved sulfide concentrations above natural background levels.
Tastes and Odors	Waters shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin, that cause nuisance, or that adversely affect beneficial uses.
Temperature	The natural receiving water temperature of inland surface waters shall not be altered unless it can be demonstrated to the satisfaction of the regional board that such alteration in temperature does not adversely affect beneficial uses. In waters with the beneficial uses of WARM or COLD, the temperature shall not be increased by more than 5° Fahrenheit (2.8° Celsius) above natural receiving water temperature.
Toxicity	All waters shall be maintained free of toxic substances in concentrations that are lethal to or that produce other detrimental responses in aquatic organisms.
Turbidity	Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases from normal background light penetration or turbidity relatable to waste discharge shall not be greater than 10 percent in areas where natural turbidity is greater than 50 Nephelometric turbidity units.
Un-Ionized Ammonia	The discharge of wastes shall not cause receiving waters to contain concentrations of un-ionized ammonia in excess of the following limits (in milligrams per liter as Nitrogen): annual median: 0.025; maximum, central bay and upstream: 0.16; maximum, lower bay: 0.4.
Chemical Constituents	Waters shall not contain chemical constituents in concentrations that negatively affect beneficial uses. The basin plan contains numerical water quality objectives for specific chemical constituents for specific stream types, aquatic resources, watersheds, tidal areas, and beneficial uses. See the tables in chapter 3 of the basin plan for more information.

Source: San Francisco Bay RWQCB 2017
RWQCB = Regional Water Quality Control Board; TMDL = total maximum daily load; COLD = cold freshwater habitat; MUN = municipal and domestic supply; WARM = warm freshwater habitat

Table 3 Groundwater Quality Objectives

Parameter	Groundwater Quality Objective
Bacteria	For groundwater basins and/or subbasins with the beneficial use of MUN, the median of the most probable number of coliform organisms over any 7-day period shall be less than 1.1 most probable number per 100 milliliters.
Organic and Inorganic Chemical Constituents	All groundwater shall be maintained free of organic and inorganic chemical constituents in concentrations that adversely affect beneficial uses. For groundwater basins and/or subbasins with the beneficial use of MUN, shall not contain concentrations of constituents in excess of the maximum or secondary maximum contaminant levels specified in Table 3-5 of the basin plan. For groundwater basins and/or subbasins with the beneficial use of AGR, groundwater shall not contain concentrations of chemical constituents in excess of levels specified in Table 3-6 of the basin plan. For groundwater basins and/or subbasins with the beneficial use of IND, groundwater shall not contain pollutant levels that impair current/potential industrial uses.
Radioactivity	For groundwater basins and/or subbasins with the beneficial use of MUN, groundwater shall not contain concentrations of radionuclides in excess of the maximum contaminant levels specified in Table 3-5 of the basin plan and Table 4 (Radioactivity) of Section 64443 of Title 22.
Taste and Odor	For groundwater basins and/or subbasins with the beneficial use of MUN, groundwater shall not contain taste- or odor-producing substances in concentrations that cause a nuisance or adversely affect beneficial uses. At a minimum, groundwater shall not contain concentrations in excess of secondary maximum contaminant levels in Table 3-5 of the basin plan.

Source: San Francisco Bay RWQCB 2017
RWQCB = Regional Water Quality Control Board; AGR = agricultural supply; MUN = municipal and domestic supply; IND = industrial service supply

Clean Water Act Section 303(d) List and Total Maximum Daily Loads in the Resource Study Area

Under Section 303(d) of the Clean Water Act, states are required to develop a list of aquatic resources that do not meet water quality objectives. States then must develop a total maximum daily load (TMDL) for every pollutant/aquatic resource combination on the list. A TMDL is a regulatory response designed to bring aquatic resources into compliance with water quality objectives over a specific timeframe. Table 4 summarizes the aquatic resources in the RSA with pollution levels that consistently exceed one or more water quality objectives that cause impairments to a beneficial use, as described in the *2014 and 2016 California Integrated Report: Clean Water Act Sections 303(d) and 305(b)* (SWRCB 2017). Aquatic resources that are within both the RSA and project footprint are indicated with a superscript note.

Table 4 Clean Water Act Section 303(d) Listed Aquatic Resources

Aquatic Resource	Impairment	Status of TMDL	Notes on TMDL
Mission Creek/ China Basin Channel[1]	Ammonia	TMDL required	Estimated completion: 2005
	Chlordane	TMDL required	Estimated completion: 2005
	Dieldrin	TMDL required	Estimated completion: 2005
	Hydrogen sulfide	TMDL required	Estimated completion: 2005
	Lead	TMDL required	Estimated completion: 2005
	Mercury	TMDL required	Estimated completion: 2005
	PAHs	TMDL required	Estimated completion: 2005
	PCBs	Addressed with approved TMDL	Approved in 2010
	Silver	TMDL required	Estimated completion: 2005
	Zinc	TMDL required	Estimated completion: 2005
San Francisco Bay, Central	Chlordane	TMDL required	Estimated completion: 2013
	DDT	TMDL required	Estimated completion: 2013
	Dieldrin	TMDL required	Estimated completion: 2013
	Dioxin compounds (including 2,3,7,8-TCDD)	TMDL required	Estimated completion: 2019
	Furan compounds	TMDL required	Estimated completion: 2019
	Invasive species	TMDL required	Estimated completion: 2019
	Mercury	Addressed with approved TMDL	Approved in 2008
	PCBs	Addressed with approved TMDL	Approved in 2010
	PCBs (dioxin-like)	Addressed with approved TMDL	Approved in 2010
	Selenium	Addressed with approved TMDL	Approved in 2016
	Trash	TMDL required	Estimated completion: 2021

Aquatic Resource	Impairment	Status of TMDL	Notes on TMDL
Islais Creek[1]	Ammonia	TMDL required	Estimated completion: 2005
	Chlordane	TMDL required	Estimated completion: 2005
	Dieldrin	TMDL required	Estimated completion: 2005
	Hydrogen sulfide	TMDL required	Estimated completion: 2005
	PAHs	TMDL required	Estimated completion: 2005
	Toxicity	TMDL required	Estimated completion: 2005
San Francisco Bay, Lower	Chlordane	TMDL required	Estimated completion: 2013
	DDT	TMDL required	Estimated completion: 2013
	Dieldrin	TMDL required	Estimated completion: 2013
	Dioxin compounds (including 2,3,7,8-TCDD)	TMDL required	Estimated completion: 2019
	Furan compounds	TMDL required	Estimated completion: 2019
	Invasive species	TMDL required	Estimated completion: 2019
	Mercury	Addressed with approved TMDL	Approved in 2008
	PCBs	Addressed with approved TMDL	Approved in 2010
	PCBs (dioxin-like)	Addressed with approved TMDL	Approved in 2010
	Trash	TMDL required	Estimated completion: 2021
Candlestick Point	Indicator bacteria	Addressed with approved TMDL	Approved in 2017
Colma Creek[1]	Trash	Addressed with action other than TMDL	Estimated attainment: 2029
San Mateo Creek, Lower[1]	Toxicity	TMDL required	Estimated completion: 2005
Lower Crystal Springs Reservoir	Mercury	TMDL required	Estimated completion: 2029
Aquatic Park (Marina Lagoon, San Mateo County)	Indicator bacteria	Addressed with approved TMDL	Approved in 2017
Kiteboard Beach (San Francisco Bay, Lower)	Indicator bacteria	TMDL required	Estimated completion: 2029
Lakeshore Park Beach (Marina Lagoon, San Mateo County)	Indicator bacteria	Addressed with approved TMDL	Approved in 2017
Laurel Creek[1]	Diazinon	Addressed with approved TMDL	Approval in 2007; applies to all creeks and pesticides

Aquatic Resource	Impairment	Status of TMDL	Notes on TMDL
San Francisquito Creek[1]	Diazinon	Addressed with approved TMDL	Approved in 2007; applies to all creeks and pesticides
	Sedimentation/ siltation	TMDL required	Estimated completion: 2013; impairment to steelhead habitat
	Trash	Addressed with action other than TMDL	Estimated attainment: 2029
Matadero Creek[1]	Diazinon	Addressed with approved TMDL	Approved in 2007; applies to all creeks and pesticides
	Trash	Addressed with action other than TMDL	Estimated attainment: 2029
Permanente Creek[1]	Diazinon	Addressed with approved TMDL	Approved in 2007; applies to all creeks and pesticides
	Selenium (total)	TMDL required	Estimated completion: 2005
	Toxicity	TMDL required	Estimated completion: 2005
	Trash	Addressed with action other than TMDL	Estimated attainment: 2029
Stevens Creek[1]	Diazinon	Addressed with approved TMDL	Approved in 2007; applies to all creeks and pesticides
	Temperature (water)	TMDL required	Estimated completion: 2005
	Toxicity	TMDL required	Estimated completion: 2005
	Trash	Addressed with action other than TMDL	Estimated attainment: 2029
Calabazas Creek[1]	Diazinon	Addressed with approved TMDL	Approved in 2007; applies to all creeks and pesticides
San Tomas Aquino Creek (Saratoga Creek)[1]	Diazinon	Addressed with approved TMDL	Approved in 2007; applies to all creeks and pesticides
	Trash	Addressed with action other than TMDL	Estimated attainment: 2029
Guadalupe Slough	Toxicity	TMDL required	Estimated completion: 2029
Los Gatos Creek (R2)[1]	Diazinon	Addressed with approved TMDL	Approved in 2007; applies to all creeks and pesticides

Aquatic Resource	Impairment	Status of TMDL	Notes on TMDL
Guadalupe River[1]	Diazinon	Addressed with approved TMDL	Approved in 2007; applies to all creeks and pesticides
	Mercury	Addressed with approved TMDL	Approved in 2010
	Trash	Addressed with action other than TMDL	Estimated attainment: 2029
Guadalupe Creek	Mercury	Addressed with approved TMDL	Approved in 2010
Alamitos (Los Alamitos) Creek	Mercury	Addressed with approved TMDL	Approved in 2010
Coyote Creek (Santa Clara County)	Trash	TMDL required	Estimated attainment: 2029
	Diazinon	Addressed with approved TMDL	Approved in 2007; applies to all creeks and pesticides
	Toxicity	TMDL required	Estimated completion: 2029

Source: SWRCB 2017
DDT = Dichlorodiphenyltrichloroethane; PAHs = polycyclic aromatic hydrocarbons; PCBs = polychlorinated biphenyl ethers; TCDD = Tetrachlorodibenzo-p-dioxin; TMDL = total maximum daily load
[1] These aquatic resources intersect the project footprint.

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SUMMARY OF IMPACTS ON BENEFICIAL USES AND CLEAN WATER ACT SECTION 303(D) LIST IMPAIRMENTS

Table 5 lists the aquatic resources within the project footprint with beneficial uses designated in the Basin Plan, as well as the applicable water quality objectives and Section 303(d) impairments, if any. Aquatic resources that do not have beneficial uses designated in the Basin Plan are not listed in the following table. However, the RWQCBs protect beneficial uses of waters of the state whether or not they are identified in a Basin Plan. Generally, the RWQCBs designate beneficial uses for unlisted aquatic resources on a case-by-case basis. In addition, the following table identifies whether temporary, permanent, and operations impacts would occur in each aquatic resource. Refer to Section 3.7, Biological and Aquatic Resources, for the impacts on aquatic resources and the mitigation measures due to the removal/disturbance of aquatic resources and wetlands.

Table 5 Summary of Impacts on Beneficial Uses and 303(d) Listed Aquatic Resources

Aquatic Resource	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the Basin Plan)	Alternative A Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative B Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives
San Francisco to South San Francisco Subsection					
Mission Creek/ China Basin Channel	COMM, EST, WILD, REC-1, REC-2, NAV	Ammonia, Chlordane, Dieldrin, Hydrogen sulfide, Lead, Mercury, PAHs, PCBs, Silver, Zinc	Table 3-1, Table 3-2, Table 3-3, Table 3-3A, Table 3-3B, Table 3-3C Dissolved oxygen: 5.0 mg/L minimum Un-ionized ammonia: 0.4 mg/L as N	Mission Creek/China Basin Channel is not within the project footprint. There would be no impact on beneficial uses, water quality objectives, or listed impairments of Mission Creek/China Basin Channel, because a portion of the project footprint within the Mission Creek watershed drains into San Francisco's combined sewer system and project features would control sediment transport and prevent nonstormwater discharges during construction and operations with BMPs.	Same as Alternative A
Drainage Ditch 1	None listed in the Basin Plan	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	A track shift and vegetation management may result in minor disturbances to the drainage ditch. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated; however, vegetation management during operations may result in intermittent impacts. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives by controlling sediment transport and preventing nonstormwater discharges into the ditch during construction and operations with BMPs.	Same as Alternative A
Islais Creek Channel	COMM, EST, WILD, REC-1, REC-2, NAV	Ammonia, Chlordane, Dieldrin, Hydrogen sulfide, PAHs, Toxicity	Table 3-1, Table 3-2, Table 3-3, Table 3-3A, Table 3-3B, Table 3-3C Dissolved oxygen: 5.0 mg/L minimum Un-ionized ammonia: 0.4 mg/L as N	Islais Creek Channel is not within the project footprint. There would be no impact on beneficial uses, water quality objectives, or listed impairments of Islais Creek Channel, because project features would control sediment transport and prevent nonstormwater discharges during construction and operations with BMPs. Additionally, a portion of the project footprint within the Islais Creek Channel watershed drains into San Francisco's combined sewer system.	Same as Alternative A
Wetland 1	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	A track shift and vegetation management may result in minor disturbances to the wetland. This work may potentially result in erosion or discharge of polluted runoff. The installation of a culvert would be required for the wetland to pass below a proposed radio communication tower. Modifications to this aquatic resource would change the slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. Culvert maintenance and vegetation management during operations may result in intermittent impacts. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges during construction and operations with BMPs.	Same as Alternative A

Aquatic Resource	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the Basin Plan)	Alternative A Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative B Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives
Drainage Ditch 2 and Wetlands	None listed in the Basin Plan Palustrine wetland beneficial uses may apply to the wetlands: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	A track shift and vegetation management may result in minor disturbances to the drainage ditch, which contains wetlands. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated; however, vegetation management during operations may result in intermittent impacts. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges during construction and operations with BMPs.	Same as Alternative A
Brisbane Wetlands	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	There would be no impact on beneficial uses or water quality objectives of Brisbane wetlands, because they are not within the project footprint.	Construction of the West Brisbane LMF would require filling much of the total wetland area. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this aquatic resource would change the slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. Project features would control sediment transport and prevent nonstormwater discharges during construction and operations with BMPs. However, all beneficial uses would be permanently affected in filled areas. Biological mitigation requirements would be determined in coordination with the Authority, USEPA, and USACE.
Wetland 6	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	Construction of the East Brisbane LMF would require filling the total wetland area. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this aquatic resource would change the slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. Project features would control sediment transport and prevent nonstormwater discharges during construction and operations with BMPs. However, all beneficial uses would be permanently affected in filled areas. Biological mitigation requirements would be determined in coordination with the Authority, USEPA, and USACE.	There would be no impact on the water quality objectives of Wetland 6, because it is not within the project footprint and project features would control sediment transport and prevent nonstormwater discharges in the watershed with BMPs.
Wetland 7	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	Construction of the blended track would require filling a portion of the wetland area. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this aquatic resource would change the slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges during construction and operations with BMPs. However, all beneficial uses would be permanently affected in filled areas. Biological mitigation requirements would be determined in coordination with the Authority, USEPA, and USACE.	Same as Alternative A.
Wetland 8	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	Construction of the blended track would require filling a portion of the wetland area. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this aquatic resource would change the slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges during construction and operations with BMPs. However, all beneficial uses would be permanently affected in filled areas. Biological mitigation requirements would be determined in coordination with the Authority, USEPA, and USACE.	Same as Alternative A.

Aquatic Resource	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the Basin Plan)	Alternative A Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative B Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives
Wetland 9	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	Construction of the blended track would require filling a portion of the wetland area. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this aquatic resource would change the slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges during construction and operations with BMPs. However, all beneficial uses would be permanently affected in filled areas. Biological mitigation requirements would be determined in coordination with the Authority, USEPA, and USACE.	Same as Alternative A.
Visitacion Creek	None listed in the Basin Plan	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	Construction of the East Brisbane LMF would require placing the creek into an underground culvert along the current creek alignment. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this channel would change the channel length and slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. However, if groundwater contributes baseflows or seepage into the creek, the proposed culvert would improve water quality by impeding seepage of shallow groundwater contaminated by leachate from the former Brisbane Class II landfill into the creek. Additionally, routine maintenance on the proposed culvert and vegetation management during operations may result in intermittent operations impacts. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges into Visitacion Creek and Visitacion Creek tributary with BMPs. However, biological mitigation requirements would be determined in coordination with the Authority, USEPA, and USACE.	There would be no impact on the water quality objectives of Visitacion Creek during construction, because it is in an underground culvert within the project footprint and there are no proposed changes to that culvert. No permanent impacts are anticipated; however, routine maintenance on the existing culvert may result in intermittent operations impacts. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Additionally, project features would control sediment transport and prevent nonstormwater discharges in the Visitacion Creek and Visitacion Creek tributary watershed during construction and operation with BMPs.
Visitacion Creek Tributary and Wetland	None listed in the Basin Plan Palustrine wetland beneficial uses may apply to the wetland: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	There would be no impact on the water quality objectives of Visitacion Creek tributary, which contains a wetland area, because it is not within the project footprint and project features would control sediment transport and prevent nonstormwater discharges in the watershed with BMPs.	Construction of the West Brisbane LMF would require temporary disturbances and permanent modifications to Visitacion Creek tributary, which contains a wetland area, likely including placement into an underground conduit or relocation. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this channel would change the channel length and slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. All beneficial uses would be permanently affected in these areas. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Additionally, vegetation management and routine maintenance on the proposed culvert may result in intermittent operations impacts. However, project features would control sediment transport and prevent nonstormwater discharges during construction and operations with BMPs. Biological mitigation requirements for fill would be determined in coordination with the Authority, USEPA, and USACE.
Visitacion Creek Wetlands	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	Construction of the East Brisbane LMF would likely require filling a portion of the wetland area. A portion of these wetlands would also be temporarily affected because that portion is in a temporary construction easement. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this aquatic resource would change the slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. All beneficial uses would be permanently affected in these areas. Additionally, vegetation management and routine maintenance on the proposed culvert may result in intermittent operations impacts. Project features would control sediment transport and prevent nonstormwater discharges during construction and operations with BMPs. Biological mitigation requirements for fill would be determined in coordination with the Authority, USEPA, and USACE.	There would be no impact on the water quality objectives or beneficial uses of the Visitacion Creek Wetlands, because it is not within the project footprint and project features would control sediment transport and prevent nonstormwater discharges into the wetlands with BMPs.

Aquatic Resource	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the Basin Plan)	Alternative A Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative B Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives
Visitacion Creek Constructed Basin 1	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	Construction of an access road for the East Brisbane LMF would require partially filling this constructed basin. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this aquatic resource would change the slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. Project features would prevent the violation of water quality objectives by controlling sediment transport and preventing nonstormwater discharges into Visitacion Creek Constructed Basin 1 during construction and operation with BMPs. Biological mitigation requirements for fill would be determined in coordination with the Authority, USEPA, and USACE.	There would be no impact on the water quality objectives or beneficial uses of Visitacion Creek Constructed Basin 1, because it is not within the project footprint and project features would control sediment transport and prevent nonstormwater discharges into the basins with BMPs.
Visitacion Creek Constructed Basin 2	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	Construction the East Brisbane LMF would require filling this constructed basin. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this aquatic resource would change the slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. Project features would prevent the violation of water quality objectives by controlling sediment transport and preventing nonstormwater discharges into Visitacion Creek Constructed Basin 2 during construction and operation with BMPs. Biological mitigation requirements for fill would be determined in coordination with the Authority, USEPA, and USACE.	There would be no impact on the water quality objectives or beneficial uses of Visitacion Creek Constructed Basin 2, because it is not within the project footprint and project features would control sediment transport and prevent nonstormwater discharges into the basins with BMPs.
Visitacion Creek Constructed Basin 3	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	The realignment of Tunnel Avenue to the east of the East Brisbane LMF would require filling the constructed basin. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this aquatic resource would change the slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. Project features would prevent the violation of water quality objectives by controlling sediment transport and preventing nonstormwater discharges into Visitacion Creek Constructed Basin 3 during construction and operation with BMPs. Biological mitigation requirements for fill would be determined in coordination with the Authority, USEPA, and USACE.	There would be no impact on the water quality objectives or beneficial uses of Visitacion Creek Constructed Basin 3, because it is not within the project footprint and project features would control sediment transport and prevent nonstormwater discharges into the basins with BMPs.
Visitacion Creek Constructed Basin 4	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	The realignment of Tunnel Avenue to the east of the East Brisbane LMF would temporarily disturb this constructed basin. This work may potentially result in erosion or discharge of polluted runoff. Project features would prevent the violation of water quality objectives by controlling sediment transport and preventing nonstormwater discharges into Visitacion Creek Constructed Basin 4 during construction and operation with BMPs.	There would be no impact on the water quality objectives or beneficial uses of Visitacion Creek Constructed Basin 4, because it is not within the project footprint and project features would control sediment transport and prevent nonstormwater discharges into the basins with BMPs.
Visitacion Creek Saline Wetlands	Estuarine wetland beneficial uses likely apply: AGR, COMM, EST, GWR, MIGR, NAV, REC-1, REC-2, SHELL, SPWN, WILD, RARE.	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	Construction of the East Brisbane LMF and an access road for the LMF would likely require filling a portion of the wetland area. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this aquatic resource would change the slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. All beneficial uses would be permanently affected in these areas. Additionally, vegetation management and routine maintenance on the proposed culvert may result in intermittent operations impacts. Project features would control sediment transport and prevent nonstormwater discharges during construction and operations with BMPs. Biological mitigation requirements for fill would be determined in coordination with the Authority, USEPA, and USACE.	There would be no impact on beneficial uses or water quality objectives of Visitacion Creek Saline Wetlands, because it is not within the project footprint and project features would control sediment transport and prevent nonstormwater discharges into the basins with BMPs.

Aquatic Resource	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the Basin Plan)	Alternative A Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative B Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives
Guadalupe Valley Creek	WARM, WILD, REC-1, REC-2	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	The existing culvert where Guadalupe Valley Creek crosses the railbed would be extended; therefore, there would be temporary and permanent impacts on Guadalupe Valley Creek. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this channel would change the channel slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. All beneficial uses would be permanently affected in the newly culverted area. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Additionally, vegetation management and routine maintenance on the proposed culvert may result in intermittent operation impacts. Project features would control sediment transport and prevent nonstormwater discharges during construction and operations with BMPs. Biological mitigation requirements for the extended culvert would be determined in coordination with the Authority, USEPA, and USACE.	Same as Alternative A
Guadalupe Valley Creek Saline Wetland	Estuarine wetland beneficial uses likely apply: AGR, COMM, EST, GWR, MIGR, NAV, REC-1, REC-2, SHELL, SPWN, WILD, RARE.	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	The existing culvert where Guadalupe Valley Creek crosses the railbed would be extended; therefore, there would be temporary and permanent impacts on this saline wetland adjacent to Guadalupe Valley Creek. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this channel would change the channel slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. All beneficial uses would be permanently affected in the newly culverted area. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Additionally, vegetation management and routine maintenance on the proposed culvert may result in intermittent operation impacts. Project features would control sediment transport and prevent nonstormwater discharges during construction and operations with BMPs. Biological mitigation requirements for the extended culvert would be determined in coordination with the Authority, USEPA, and USACE.	Same as Alternative A
Brisbane Lagoon	EST, WILD, REC-1, REC-2	None	Table 3-1, Table 3-2, Table 3-3, Table 3-3A, Table 3-3B, Table 3-3C Dissolved oxygen: 5.0 mg/L minimum Un-ionized ammonia: 0.4 mg/L as N	There would be no impact on beneficial uses or water quality objectives of Brisbane Lagoon, because it is anticipated that it would be avoided by construction and operations activities. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Additionally, project features would control sediment transport and prevent nonstormwater discharges into Brisbane Lagoon and other tributary drainage systems.	Same as Alternative A
Brisbane Lagoon Constructed Basins	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	The realignment of Lagoon Road would require filling a portion of the basins. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this aquatic resource would change the slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. Project features would prevent the violation of water quality objectives by controlling sediment transport and preventing nonstormwater discharges into the Brisbane Lagoon Constructed Basins during construction and operation with BMPs. Biological mitigation requirements for fill would be determined in coordination with the Authority, USEPA, and USACE.	Same as Alternative A.

Aquatic Resource	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the Basin Plan)	Alternative A Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative B Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives
Brisbane Lagoon Saline Wetlands	Estuarine wetland beneficial uses likely apply: AGR, COMM, EST, GWR, MIGR, NAV, REC-1, REC-2, SHELL, SPWN, WILD, RARE.	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	There would be no impact on beneficial uses or water quality objectives of Brisbane Lagoon Saline Wetlands, because it is anticipated that it would be avoided by construction and operations activities. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Additionally, project features would control sediment transport and prevent nonstormwater discharges into Brisbane Lagoon and other tributary drainage systems.	Same as Alternative A
Oyster Point Channel	None listed in the Basin Plan	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	There would be no impact on beneficial uses or water quality objectives of Oyster Point Channel during construction, because there are no proposed changes to the existing crossing structure and there are no anticipated operations impacts. However, routine maintenance may be required on the existing bridge/culvert structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Additionally, project features would control sediment transport and prevent nonstormwater discharges into Oyster Point Channel.	Same as Alternative A
Saline Wetland 1	Estuarine wetland beneficial uses likely apply: AGR, COMM, EST, GWR, MIGR, NAV, REC-1, REC-2, SHELL, SPWN, WILD, RARE.	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	Vegetation management could result in minor disturbances to the saline wetland during construction. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated; however, vegetation management could also result in intermittent operation impacts. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives by controlling sediment transport and preventing nonstormwater discharges into the wetland during construction and operations with BMPs.	Same as Alternative A
Drainage Ditch 13	None listed in the Basin Plan	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	A track shift and vegetation management may result in minor disturbances to the drainage ditch. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated; however, vegetation management during operations may result in intermittent impacts. Project features would prevent the violation of water quality objectives by controlling sediment transport and preventing nonstormwater discharges into the ditch during construction and operations with BMPs.	Same as Alternative A
Wetland 3	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	Vegetation management could result in in minor disturbances to the wetland during construction. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated; however, vegetation management could also result in intermittent operation impacts. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives by controlling sediment transport and preventing nonstormwater discharges into the wetland during construction and operations with BMPs.	Same as Alternative A
Colma Creek	WARM, WILD, REC-1, REC-2	Trash	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	There would be no impact on beneficial uses, water quality objectives, or listed impairments of Colma Creek during construction, because there are no proposed changes to the existing crossing structure. However, routine maintenance may be required on the existing bridge structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges into the Colma Creek watershed during intermittent maintenance activities. Additionally, during operations, good housekeeping practices and maintaining the proposed right-of-way would minimize accumulations of trash that may develop and subsequently affect the trash impairment.	Same as Alternative A

Aquatic Resource	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the Basin Plan)	Alternative A Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative B Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives
San Bruno to San Mateo Subsection					
Drainage Ditch 3	None listed in the Basin Plan	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	Vegetation management could result in in minor disturbances to the drainage ditch during construction. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated; however, vegetation management could also result in intermittent operation impacts. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives by controlling sediment transport and preventing nonstormwater discharges into the ditch during construction and operations with BMPs.	Same as Alternative A
Wetland 4	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	Vegetation management could result in in minor disturbances to the wetland swale during construction. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated; however, vegetation management could also result in intermittent operation impacts. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives by controlling sediment transport and preventing nonstormwater discharges into the wetland during construction and operations with BMPs.	Same as Alternative A
Drainage Ditch 4	None listed in the Basin Plan	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	Vegetation management could result in in minor disturbances to the drainage ditch during construction. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated; however, vegetation management could also result in intermittent operation impacts. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives by controlling sediment transport and preventing nonstormwater discharges into the ditch during construction and operations with BMPs.	Same as Alternative A
Drainage Ditch 5	None listed in the Basin Plan	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	A track shift and vegetation management may result in minor disturbances to the drainage ditch during construction. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated; however, vegetation management could also result in intermittent operation impacts. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives by controlling sediment transport and preventing nonstormwater discharges into the ditch during construction and operations with BMPs.	Same as Alternative A
Drainage Ditch 6	None listed in the Basin Plan	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	Vegetation management could result in in minor disturbances to the drainage ditch during construction. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated; however, vegetation management could also result in intermittent operation impacts. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives by controlling sediment transport and preventing nonstormwater discharges into the ditch during construction and operations with BMPs.	Same as Alternative A

Aquatic Resource	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the Basin Plan)	Alternative A Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative B Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives
San Bruno Creek	WARM, WILD, REC-1, REC-2	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	There would be no impact on beneficial uses or water quality objectives of San Bruno Creek during construction, because it flows through an underground culvert within the project footprint and there are no proposed changes to the existing culvert. No permanent impacts are anticipated. The aquatic resource would receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges into the drainage systems that outfall into San Bruno Creek during construction and operations.	Same as Alternative A
El Zanjon	None listed in the Basin Plan	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	There would be no impact on water quality objectives of El Zanjon during construction, because it flows through an underground culvert within the project footprint and there are no proposed changes to the existing culvert. No permanent impacts are anticipated. The aquatic resource would receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges into the drainage systems that outfall into El Zanjon during construction and operations.	Same as Alternative A
Drainage Ditch 7	None listed in the Basin Plan	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	A track shift and vegetation management may result in minor disturbances to the drainage ditch during construction. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated; however, vegetation management could also result in intermittent operation impacts. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives by controlling sediment transport and preventing nonstormwater discharges into the ditch during construction and operations with BMPs.	Same as Alternative A
Highline Creek Tributary and Wetlands	None listed in the Basin Plan Palustrine wetland beneficial uses may apply to the wetlands: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	Culverts would be installed to allow flows to pass below two alternate sites for a radio communication tower. This work may potentially result in erosion or discharge of polluted runoff. Modifications to the channel would change the channel slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. All beneficial uses would be permanently affected in the culverted areas. Biological mitigation requirements for the new culverts would be determined in coordination with the Authority, USEPA, and USACE. Routine maintenance may be required on the culvert structures intermittently during operations. Additionally, vegetation management could result in intermittent operation impacts. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges in the Highline Creek watershed during construction and operations with BMPs.	Same as Alternative A

Aquatic Resource	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the Basin Plan)	Alternative A Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative B Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives
Highline Creek	None listed in the Basin Plan	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	Upstream of the railbed, a daylighted section of the channel would be covered and a portion of the channel would be relocated. Where the channel crosses the railbed, the existing eight 54-inch reinforced concrete pipe culverts would be extended. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this channel would change the channel slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. All beneficial uses would be permanently affected in the newly covered and culverted areas. Biological mitigation requirements would be determined in coordination with the Authority, USEPA, and USACE. Routine maintenance may be required on the culvert structures intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges in the Highline Creek watershed during construction and operations with BMPs.	Same as Alternative A
Drainage Ditch 8	None listed in the Basin Plan	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	Drainage Ditch 8 would be temporarily disturbed from work within the ditch required for permanent utility relocations and demolition activities. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges into the ditch during construction and operations with BMPs.	Same as Alternative A
El Portal Canal	None listed in the Basin Plan	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	The two existing 54-inch corrugated metal pipe culverts where El Portal Canal crosses the railbed would be extended in the upstream direction. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this channel would change the channel slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. Biological mitigation requirements would be determined in coordination with the Authority, USEPA, and USACE. Routine maintenance may be required on the culvert structures intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges in the El Portal Canal watershed during construction and operations with BMPs.	Same as Alternative A
Mills Creek Tributary Wetland	Beneficial uses of Mills Creek may apply: WARM, WILD, REC-1, REC-2 Palustrine wetland beneficial uses may also apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	The existing culvert near this wetland would be extended in the upstream direction, which may require work in the wetland area. This work may potentially result in erosion or discharge of polluted runoff. Modifications to the culvert would change the channel slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the wetland. Biological mitigation requirements for the extended culvert would be determined in coordination with the Authority, USEPA, and USACE. Vegetation management could also result in intermittent operation impacts, and routine maintenance on the culvert could result in intermittent operations impacts. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges into Mills Creek tributary wetland during construction and operations.	Same as Alternative A

Aquatic Resource	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the Basin Plan)	Alternative A Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative B Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives
Mills Creek	WARM, WILD, REC-1, REC-2	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	There would be no impact on water quality objectives of Mill Creek during construction, because there are no proposed changes to the existing culvert where it crosses the railbed. However, vegetation management could result in in minor disturbances and intermittent operation impacts, and routine maintenance on the existing culvert could result in intermittent operations impacts. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges into Mills Creek during construction and operations.	Same as Alternative A
Easton Creek	WARM, WILD, REC-1, REC-2	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	The existing culvert where Easton Creek crosses the railbed and its concrete-lined channel would be protected during the construction phase. However, a track shift could result in minor disturbances during construction. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated; however, routine maintenance may be required on the existing culvert structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges into Easton Creek during construction and operations with BMPs.	Same as Alternative A
Sanchez Creek	WARM, WILD, REC-1, REC-2	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	The existing 4-foot by 10-foot box culvert would be extended. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this channel would change the channel slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. Biological mitigation requirements for the extended culvert would be determined in coordination with the Authority, USEPA, and USACE. Additionally, vegetation management could result in temporary and intermittent operation impacts, and routine maintenance on the existing culvert could result in intermittent operations impacts. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges into Sanchez Creek during construction and operations with BMPs.	Same as Alternative A
Sanchez Creek Tributary and Wetland	Beneficial uses of Sanchez Creek apply: WARM, WILD, REC-1, REC-2 Palustrine wetland beneficial uses may apply to the wetland: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	The existing 54-inch reinforced concrete pipe culvert would be protected during the construction phase. However, a track shift could result in minor disturbances during construction. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated; however, vegetation management could result in intermittent operation impacts, and routine maintenance on the existing culvert could result in intermittent operations impacts. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges into Sanchez Creek tributary during construction and operations with BMPs.	Same as Alternative A
Burlingame Creek	None listed in the Basin Plan	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	There would be no impact on water quality objectives of Burlingame Creek during construction, because there are no proposed changes to the existing culvert where it crosses the railbed. However, vegetation management and routine maintenance on the existing culverts could result in intermittent operation impacts. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges into Burlingame Creek during construction and operations with BMPs.	Same as Alternative A

Aquatic Resource	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the Basin Plan)	Alternative A Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative B Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives
San Mateo Creek	FRSH, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2	Toxicity	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 7.0 mg/L minimum	There are no proposed changes to the existing bridge over San Mateo Creek. However, a temporary construction easement in the creek, a track shift, and construction activities at the San Mateo station could result in minor disturbances to San Mateo Creek. This work may potentially result in erosion or discharge of polluted runoff. Additionally, vegetation management and routine maintenance on the existing bridge could result in intermittent operation impacts. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives by controlling sediment transport and preventing nonstormwater discharges into the creek during construction and operations with BMPs.	Same as Alternative A
San Mateo to Palo Alto Subsection					
Drainage Ditch 9	None listed in the Basin Plan	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	There would be no permanent impacts on Drainage Ditch 9, but vegetation management could result in in minor disturbances during construction. This work may potentially result in erosion or discharge of polluted runoff. Vegetation management could also result in intermittent operation impacts to the ditch. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives by controlling sediment transport and preventing nonstormwater discharges into the ditch during construction and operations with BMPs.	The existing 18-inch reinforced concrete pipe culvert where the ditch crosses the railbed would be extended to accommodate the passing track. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this channel would change the channel slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. Biological mitigation requirements for the extended culvert would be determined in coordination with the Authority, USEPA, and USACE. Additionally, vegetation management could result in intermittent operation impacts to the ditch. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives by controlling sediment transport and preventing nonstormwater discharges into the ditch during construction and operations with BMPs.
Leslie Creek	WARM, WILD, REC-1, REC-2	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	The existing 4.4-foot by 10.6-foot box culvert would be protected during the construction phase, so there would be no permanent impacts on Leslie Creek. However, vegetation management could result in minor disturbances during construction. This work may potentially result in erosion or discharge of polluted runoff. Vegetation management could also result in intermittent operation impacts to Leslie Creek, and routine maintenance on the existing culvert could result in intermittent operations impacts. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives and impairment of beneficial uses by controlling sediment transport and preventing nonstormwater discharges into Leslie Creek during construction and operations with BMPs.	The existing 4.4-foot by 10.6-foot box culvert would be extended to accommodate the passing track. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this channel would change the channel length and slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. Biological mitigation requirements for the extended culvert would be determined in coordination with the Authority, USEPA, and USACE. Additionally, vegetation management could result in intermittent operation impacts to Leslie Creek, and routine maintenance on the existing culvert could result in intermittent operations impacts. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges into Leslie Creek during construction and operations with BMPs.
Drainage Ditch 11	None listed in the Basin Plan	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	There are no proposed changes to the culvert where the ditch crosses the railbed. However, vegetation management could result in minor disturbances during construction. This work may potentially result in erosion or discharge of polluted runoff. Vegetation management may also result in intermittent operation impacts to the drainage ditch. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives by controlling sediment transport and preventing nonstormwater discharges into the ditch during construction and operations with BMPs.	The existing 30-inch reinforced concrete pipe culvert where the ditch crosses the railbed would be extended to accommodate the passing track, and the longitudinal portion of the ditch may require relocation farther away from the widened railbed. Vegetation management could result in minor disturbances during construction. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this channel would change the channel length and slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. Biological mitigation requirements would be determined in coordination with the Authority, USEPA, and USACE. Additionally, vegetation management may result in intermittent operation impacts to the drainage ditch. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges into the ditch during construction and operations with BMPs.

Aquatic Resource	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the Basin Plan)	Alternative A Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative B Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives
Borel Creek	WARM, WILD, REC-1, REC-2	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	Vegetation management may result in minor disturbances during construction. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated; however, vegetation management and routine maintenance on the existing culvert could result in intermittent operations impacts. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives and impairment of beneficial uses by controlling sediment transport and preventing nonstormwater discharges into Borel Creek during construction and operations with BMPs.	The 10-foot wide, concrete-lined channel east of and parallel to the railbed would be relocated to the north of the passing track and the culvert and bridge where the channel crosses the passing track would be widened. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this channel would change the channel length and slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. Biological mitigation requirements would be determined in coordination with the Authority, USEPA, and USACE. Additionally, vegetation management and routine maintenance on the existing culvert could result in intermittent operations impacts. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges into Borel Creek during construction and operations with BMPs.
Wetland 5	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	Vegetation management may result in minor disturbances to the wetland during construction. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated; vegetation management could also result in intermittent operation impacts on the wetland. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives and impairment of beneficial uses by controlling sediment transport and preventing nonstormwater discharges into the wetland during construction and operations with BMPs.	All or a portion of this wetland would be filled to accommodate the passing track. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this aquatic resource would change the slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. If the wetland is completely filled, this would cause a depletion of water resources within the Project Section. Biological mitigation requirements for fill would be determined in coordination with the Authority, USEPA, and USACE. Project features would control sediment transport and prevent nonstormwater discharges into the wetland during construction and operations with BMPs.
Drainage Ditch 12	None listed in the Basin Plan	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	Vegetation management may result in minor disturbances to the ditch during construction. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated; however, vegetation management could also result in intermittent operation impacts to the ditch. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives by controlling sediment transport and preventing nonstormwater discharges into the ditch during construction and operations with BMPs.	Same as Alternative A
Fiesta Creek	None listed. Beneficial uses of Borel Creek may apply: WARM, WILD, REC-1, REC-2 Palustrine wetland beneficial uses may also apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	Vegetation management may result in minor disturbances to Fiesta Creek during construction. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated; vegetation management could also result in intermittent operation impacts to Fiesta Creek. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives and impairment of beneficial uses by controlling sediment transport and preventing nonstormwater discharges into the creek during construction and operations with BMPs.	Same as Alternative A

Aquatic Resource	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the Basin Plan)	Alternative A Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative B Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives
Laurel Creek	WARM, WILD, REC-1, REC-2	Diazinon	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	There would be no impact on the water quality objectives, beneficial uses, or diazinon impairment of Laurel Creek during construction. There would be no impact during construction because Laurel Creek is entirely in an underground culvert within the project footprint except for a small daylighted area that is surrounded by permanent fencing. However, routine maintenance may be required on the existing culvert structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges into Laurel Creek during construction and operations with BMPs. Additionally, the pesticide diazinon would not be used for any construction of operations phase activities.	The only daylighted portion of Laurel Creek within the project footprint would be permanently covered to accommodate the passing track. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this channel would change the channel slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. Biological mitigation requirements would be determined in coordination with the Authority, USEPA, and USACE. Routine maintenance may be required on the existing culvert structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges into Laurel Creek during construction and operations with BMPs. Additionally, the pesticide diazinon would not be used for any construction of operations phase activities.
Laurel Creek Tributary	Beneficial uses of Laurel Creek apply: WARM, WILD, REC-1, REC-2	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	Vegetation management may result in minor disturbances to Laurel Creek tributary during construction. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated; however, vegetation management could also result in intermittent operation impacts to Laurel Creek tributary, and routine maintenance may be required on the existing culvert structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives and impairment of beneficial uses by controlling sediment transport and preventing nonstormwater discharges into the creek during construction and operations with BMPs.	Relocation of the channel or other permanent modifications may be required to accommodate the passing track. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this channel would change the channel slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. Biological mitigation requirements for permanent impacts would be determined in coordination with the Authority, USEPA, and USACE. Routine maintenance may be required on the existing culvert structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges into Laurel Creek tributary during construction and operations with BMPs.
Laurel Creek Tributary Wetland	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	Vegetation management may result in minor disturbances to Laurel Creek tributary wetland during construction. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated; however, vegetation management could also result in intermittent operation impacts to Laurel Creek tributary wetland, and routine maintenance may be required on the existing culvert structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives and impairment of beneficial uses by controlling sediment transport and preventing nonstormwater discharges into the creek during construction and operations with BMPs.	Relocation of the channel or other permanent modifications may be required to accommodate the passing track. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this wetland would change the slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the wetland. Biological mitigation requirements for permanent impacts would be determined in coordination with the Authority, USEPA, and USACE. Routine maintenance may be required on the existing culvert structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges into Laurel Creek tributary wetland during construction and operations with BMPs.
Belmont Creek	WARM, WILD, REC-1, REC-2	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	Vegetation management may result in minor disturbances to Belmont Creek during construction. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated; however, vegetation management could also result in intermittent operation impacts to Belmont Creek. Routine maintenance may be required on the existing culvert structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives and impairment of beneficial uses by controlling sediment transport and preventing nonstormwater discharges into the creek during construction and operations with BMPs.	The existing concrete channel where Belmont Creek crosses the railbed would be widened to accommodate the passing track. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this channel would change the channel slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. Biological mitigation requirements would be determined in coordination with the Authority, USEPA, and USACE. Routine maintenance may be required on the proposed culvert structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges into Belmont Creek during construction and operations with BMPs.

Aquatic Resource	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the Basin Plan)	Alternative A Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative B Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives
Brittan (Arroyo) Creek	None listed. Beneficial uses of Pulgas Creek apply: WARM, WILD, REC-1, REC-2	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	There would be no impact on the water quality objectives or beneficial uses of Brittan (Arroyo) Creek during construction. There would be no impact during construction because there are no proposed changes to the existing culvert and the creek is in a concrete channel with vertical walls that is surrounded by permanent fencing. However, routine maintenance may be required on the existing culvert structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges in the Brittan (Arroyo) Creek watershed during construction and operations with BMPs.	The existing twin 5-foot by 12-foot box culvert would be extended to enclose the creek into an underground conduit below the passing track and reconstructed San Carlos Station. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this channel would change the channel slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. Biological mitigation requirements for the extended culvert would be determined in coordination with the Authority, USEPA, and USACE. Routine maintenance may be required on the existing culvert structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges in the Brittan (Arroyo) Creek watershed during construction and operations with BMPs.
Pulgas Creek	WARM, WILD, REC-1, REC-2	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	There would be no impact on the water quality objectives or beneficial uses of Pulgas Creek during construction, because there are no proposed changes to the existing culvert and a majority of the creek is in an underground conduit within the project footprint. However, routine maintenance may be required on the existing culvert structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges in the Pulgas Creek watershed during construction and operations with BMPs.	The existing twin 6-foot by 12-foot box culvert would be extended to accommodate the passing track. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this channel would change the channel slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. Biological mitigation requirements for the extended culvert would be determined in coordination with the Authority, USEPA, and USACE. Routine maintenance may be required on the existing culvert structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges in the Pulgas Creek watershed during construction and operations with BMPs.
Cordilleras Creek	WARM, WILD, REC-1, REC-2	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	Vegetation management may result in minor disturbances to Cordilleras Creek during construction. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated; however, vegetation management could also result in intermittent operation impacts on Cordilleras Creek, and routine maintenance may be required on the existing culvert structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges into the creek during construction and operations with BMPs.	The existing drainage arch structure would be extended to accommodate the passing track. This work may potentially result in erosion or discharge of polluted runoff. Modifications to this channel would change the channel slopes, affecting the path, speed, and volume of existing discharges to and existing flows within the aquatic resource. Biological mitigation requirements for the extended culvert would be determined in coordination with the Authority, USEPA, and USACE. Routine maintenance may be required on the proposed culvert structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges into Cordilleras Creek during construction and operations with BMPs.
Arroyo Ojo de Agua	WARM, WILD, REC-1, REC-2	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	There would be no impact on the water quality objectives or beneficial uses of Arroyo Ojo de Agua. There would be no impact because the creek is almost entirely within an underground conduit within the project footprint and there are no proposed changes to the existing culvert. However, routine maintenance may be required on the existing culvert structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges into drainage systems within the Arroyo Ojo de Aqua watershed during construction and operations with BMPs.	Same as Alternative A

Aquatic Resource	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the Basin Plan)	Alternative A Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative B Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives
Redwood Creek	WARM, WILD, REC-1, REC-2	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	There would be no impact on the water quality objectives or beneficial uses of Redwood Creek, because the creek is entirely within an underground conduit within the project footprint and there are no proposed changes to the existing culvert. However, routine maintenance may be required on the existing culvert structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges into drainage systems within the Redwood Creek watershed during construction and operations with BMPs.	Same as Alternative A
Atherton Channel	WARM, WILD, REC-1, REC-2	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	The existing twin box culverts would be protected during the construction phase. However, vegetation management may result in minor disturbances to Atherton Channel during construction. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated; however, vegetation management could also result in intermittent operation impacts on Atherton Channel, and routine maintenance may be required on the existing culvert structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives and impairment of beneficial uses by controlling sediment transport and preventing nonstormwater discharges into the channel during construction and operations with BMPs.	Same as Alternative A
San Francisquito Creek	COLD, MIGR, SPWN, WARM, WILD, REC-1, REC-2	Diazinon, Sedimentation/siltation, Trash	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 7.0 mg/L minimum	There would be a track shift on the existing bridge over San Francisquito Creek, but there are no proposed changes to the bridge structure. However, vegetation management may result in minor disturbances to San Francisquito Creek during construction. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated; however, vegetation management and routine maintenance may be required on the existing bridge structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives and impairment of beneficial uses by controlling sediment transport and preventing nonstormwater discharges into the creek during construction and operations with BMPs. Due to the sediment-related impairment, robust construction site BMPs that stabilize disturbed soil and minimize erosion would be employed near San Francisquito Creek. During operations, good housekeeping practices and maintaining the proposed right-of-way would minimize accumulations of trash that may develop and subsequently affect the trash impairment. Additionally, the pesticide diazinon would not be used for any construction of operations phase activities.	Same as Alternative A
Constructed Watercourse 1	None listed in the Basin Plan.	None	Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	A track shift may result in minor disturbances to the watercourse during construction. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated. Vegetation management near the watercourse may be required intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives and impairment of beneficial uses by controlling sediment transport and preventing nonstormwater discharges into the watercourse during construction and operations with BMPs.	Same as Alternative A

Aquatic Resource	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the Basin Plan)	Alternative A Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative B Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives
Matadero Creek	COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2	Diazinon, Trash	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 7.0 mg/L minimum	There would be no impact on the water quality objectives or beneficial uses of Matadero Creek during construction, because there are no proposed changes to the existing culvert. However, a track shift may result in minor disturbances to the creek during construction. This work may potentially result in erosion or discharge of polluted runoff. Routine maintenance may be required on the existing culvert structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges into drainage systems within the Matadero Creek watershed during construction and operations with BMPs. During operations, good housekeeping practices and maintaining the proposed right-of-way would minimize accumulations of trash that may develop and subsequently affect the trash impairment. Additionally, the pesticide diazinon would not be used for any construction of operations phase activities.	Same as Alternative A
Barron Creek	WARM, WILD, REC-1, REC-2	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	A track shift may result in minor disturbances to Barron Creek during construction. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated; however, routine maintenance may be required on the existing culvert structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives and impairment of beneficial uses by controlling sediment transport and preventing nonstormwater discharges into the creek during construction and operations with BMPs.	Same as Alternative A
Adobe Creek	COLD, WARM, WILD, REC-1, REC-2	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 7.0 mg/L minimum	There would be no impact on the water quality objectives or beneficial uses of Adobe Creek during construction, because there are no proposed changes to the existing. However, routine maintenance may be required on the existing culvert structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would control sediment transport and prevent nonstormwater discharges into drainage systems within the Adobe Creek watershed during construction and operations with BMPs.	Same as Alternative A
Mountain View to Santa Clara Subsection					
Permanente Creek	GWR, COLD, RARE, SPWN, WARM, WILD REC-1, REC-2	Diazinon, Selenium (total), Toxicity, Trash	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 7.0 mg/L minimum	There would be no impact on the water quality objectives or beneficial uses of Permanente Creek during construction, because there are no proposed changes to the existing culvert. However, routine maintenance may be required on the existing culvert structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives and impairment of beneficial uses by controlling sediment transport and preventing nonstormwater discharges into Permanente Creek during construction and operations with BMPs. During operations, good housekeeping practices and maintaining the proposed right-of-way would minimize accumulations of trash that may develop and subsequently affect the trash impairment. Additionally, the pesticide diazinon would not be used for any construction of operations phase activities. There would be no impact on the selenium impairment, because the primary source of selenium in the creek is a quarry upstream of the project footprint.	Same as Alternative A

Aquatic Resource	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the Basin Plan)	Alternative A Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative B Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives
Stevens Creek	FRSH, GWR, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2	Diazinon, Temperature (water), Toxicity, Trash	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 7.0 mg/L minimum	A track shift and vegetation management may result in minor disturbances to Stevens Creek during construction. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated; however, vegetation management may also result in intermittent operation impacts to Stevens Creek, and routine maintenance may be required on the existing culvert structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives and impairment of beneficial uses by controlling sediment transport and preventing nonstormwater discharges into Stevens Creek during construction and operations with BMPs. During operations, good housekeeping practices and maintaining the proposed right-of-way would minimize accumulations of trash that may develop and subsequently affect the trash impairment. Additionally, the pesticide diazinon would not be used for any construction of operations phase activities. Vegetation management could result in small, incremental increases in water temperature, but these changes are not likely to be detectable.	Same as Alternative A
Sunnyvale East Channel	None listed. Beneficial uses of Guadalupe Slough apply: EST, RARE, WILD, REC-1, REC-2.	None	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 5.0 mg/L minimum	A track shift and vegetation management may result in minor disturbances to the channel during construction. This work may potentially result in erosion or discharge of polluted runoff. No permanent impacts are anticipated; however, vegetation management and routine maintenance on the existing culvert structure may result in intermittent operations impacts. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives and impairment of beneficial uses by controlling sediment transport and preventing nonstormwater discharges into Sunnyvale East Channel during construction and operations with BMPs.	Same as Alternative A
Calabazas Creek	AGR, GWR, COLD, WARM, WILD, REC-1, REC-2	Diazinon	Table 3-1, Table 3-2, Table 3-4, Table 3-6 Dissolved oxygen: 7.0 mg/L minimum	There would be no impact on the water quality objectives, beneficial uses, or listed impairments of Calabazas Creek during construction, because there are no proposed changes to the existing culvert and the channel is in an underground conduit within the project footprint. However, routine maintenance may be required on the existing culvert structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives and impairment of beneficial uses by controlling sediment transport and preventing nonstormwater discharges into drainage systems within the Calabazas Creek watershed during construction and operations with BMPs. Additionally, the pesticide diazinon would not be used for any construction of operations phase activities.	Same as Alternative A
El Camino Storm Drain	None listed. Beneficial uses of Calabazas Creek apply: AGR, GWR, COLD, WARM, WILD, REC-1, REC-2.	None	Table 3-1, Table 3-2, Table 3-4, Table 3-6 Dissolved oxygen: 7.0 mg/L minimum	There would be no impact on the water quality objectives or beneficial uses of El Camino Storm Drain during construction, because just a small portion of the channel is within the project footprint and it is expected to be avoided by construction activities. However, vegetation management may be required intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives and impairment of beneficial uses by controlling sediment transport and preventing nonstormwater discharges into drainage systems within the El Camino Storm Drain watershed during construction and operations with BMPs.	Same as Alternative A

Aquatic Resource	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the Basin Plan)	Alternative A Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative B Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives
San Tomas Aquino Creek (Saratoga Creek)	COLD, RARE, WARM, WILD, REC-1, REC-2	Diazinon, Trash	Table 3-1, Table 3-2, Table 3-4 Dissolved oxygen: 7.0 mg/L minimum	There would be no impact on the water quality objectives, beneficial uses, or listed impairments of San Tomas Aquino Creek during construction, because there are no proposed changes to the existing culvert. However, routine maintenance may be required on the existing culvert structure intermittently during operations. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Project features would prevent the violation of water quality objectives and impairment of beneficial uses by controlling sediment transport and preventing nonstormwater discharges into drainage systems within the San Tomas Aquino Creek watershed during construction and operations with BMPs. During operations, good housekeeping practices and maintaining the proposed right-of-way would minimize accumulations of trash that may develop and subsequently affect the trash impairment. Additionally, the pesticide diazinon would not be used for any construction of operations phase activities.	Same as Alternative A
San Jose Diridon Station Approach Subsection					
Los Gatos Creek	MUN, FRSH, AGR, GWR, COLD, RARE, WARM, WILD, REC-1	Diazinon	Table 3-1, Table 3-2, Table 3-4, Table 3-5, Table 3-6 Dissolved oxygen: 7.0 milligrams per liter minimum	The project would use the existing Los Gatos Creek bridge. This work may potentially result in erosion or discharge of polluted runoff. Operations would include intermittent work in or near the channel of Los Gatos Creek, such as vegetation management and bridge maintenance. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Vegetation management may result in leaks, spills, or other discharges of pesticides to Los Gatos Creek. However, the Authority would not use diazinon for vegetation management. With implementation of IAMFs, water quality objectives would not be violated during construction and operations.	Viaduct to I-880: The project would result in minor disturbances to Los Gatos Creek during construction of a viaduct without piers inside the channel. This work may potentially result in erosion or discharge of polluted runoff. Operations would include intermittent work in or near the channel of Los Gatos Creek, such as vegetation management and bridge maintenance. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Vegetation management may result in leaks, spills, or other discharges of pesticides to Los Gatos Creek. However, the Authority would not use diazinon for vegetation management. With implementation of IAMFs, water quality objectives would not be violated during construction and operations. Viaduct to Scott Boulevard: Same as Viaduct to I-880.
Guadalupe River	GWR, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2	Mercury, trash, diazinon	Table 3-2, Table 3-4, Table 3-4A Dissolved oxygen: 7.0 milligrams per liter minimum Mercury: 2.4 micrograms per liter 1-hour average Methylmercury: 0.05 milligrams per kilogram fish tissue (5–15 centimeters in length); 0.1 milligrams per kilogram fish (15–35 centimeters in length)	The project would build a new bridge over Guadalupe River, requiring temporary stream diversion and dewatering. This work may potentially result in erosion or discharge of polluted runoff. Grading and fill for the widened crossing would change the path, speed, and volume of existing discharges and flows. Biological mitigation requirements for the widened bridge would be determined in coordination with the Authority, CDFW, SWRCB, USEPA, and USACE. Operations would include intermittent work in and near the Guadalupe River, such as vegetation management and bridge maintenance. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Discharges of refuse from the construction site may exacerbate the trash impairment. Construction site BMPs and good housekeeping would avoid or minimize the potential for discharging refuse into Guadalupe River. Vegetation management may result in leaks, spills, or other discharges of pesticides to Guadalupe River. However, the Authority would not use diazinon for vegetation management. Project features would control sediment transport and prevent nonstormwater discharges into the ditch during construction and operations with BMPs.	Viaduct to I-880: The project would result in minor disturbances to Guadalupe River to construct a viaduct without piers inside the channel. This work may potentially result in erosion or discharge of polluted runoff. Operations would include intermittent work in or near the channel of Guadalupe River, such as vegetation management and bridge maintenance. The aquatic resource would also receive incremental increases in contaminants released from trains during operations, such as brake dust and PAHs. Discharges of refuse from the construction site may exacerbate the trash impairment. Construction site BMPs and good housekeeping would avoid or minimize the potential for discharging refuse into Guadalupe River. Vegetation management may result in leaks, spills, or other discharges of pesticides to Guadalupe River. However, the Authority would not use diazinon for vegetation management. Project features would control sediment transport and prevent nonstormwater discharges into the ditch during construction and operations with BMPs. Viaduct to Scott Boulevard: Same as Viaduct to I-880.

Aquatic Resource	Existing Beneficial Uses	CWA Section 303(d) List Impairments	Water Quality Objectives (tables referenced are in the Basin Plan)	Alternative A Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives	Alternative B Effects on Beneficial Uses, Listed Impairments, and Water Quality Objectives
Palustrine Forested Wetland 6	Palustrine wetland beneficial uses likely apply: AGR, COLD, FRSH, GWR, NAV, REC-1, REC-2, SPWN, WARM, WILD, RARE.	None listed.	Table 3-4	The project would result in minor disturbances to Palustrine Forested Wetland 6 in order to build a new bridge over Guadalupe River. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Palustrine Forested Wetland 6.	Viaduct to I-880: The project would result in minor disturbances to Palustrine Forested Wetland 6 in order to build a viaduct over Guadalupe River. This work may potentially result in erosion or discharge of polluted runoff. Operations would avoid Palustrine Forested Wetland 6. Viaduct to Scott Boulevard: Same as Viaduct to I-880.

Source: San Francisco Bay RWQCB 2017; SWRCB 2017
Authority = California High-Speed Rail Authority
BMP = best management practices
CDFW = California Department of Fish and Wildlife
CWA = Clean Water Act
I- = Interstate
IAMF = impact avoidance and minimization feature
LMF = light maintenance facility
mg/L = milligrams per liter
PAHs = Polycyclic aromatic hydrocarbons
PCBs = Polychlorinated biphenyls
USACE = U.S. Army Corps of Engineers
USEPA = U.S. Environmental Protection Agency
AGR = agricultural supply; COLD = cold freshwater habitat; COMM = commercial and sport fishing; EST = estuarine habitat; FRSH = freshwater replenishment; GWR = groundwater recharge; MIGR = fish migration; NAV = navigation; RARE = preservation of rare, threatened, or endangered species; REC-1 = water contact recreation; REC-2 = noncontact water recreation; SPWN = fish spawning, reproduction or early development; WARM = warm freshwater habitat; WILD = wildlife habitat
Aquatic resources are generally listed from north to south along the San Francisco to San Jose Project Section alignment.
Refer to the Basin Plan Chapter 3 tables referenced above for a complete inventory of numerical water quality objectives.
Where aquatic resources have both COLD and WARM as beneficial uses, the more conservative dissolved oxygen minimum concentration was applied (i.e., 7.0 mg/L).

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REFERENCES

California Regional Water Quality Control Board, San Francisco Bay Region (San Francisco Bay RWQCB). 2017. *San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan)*. May 4, 2017.

State Water Resources Control Board (SWRCB). 2017. *2014 and 2016 California Integrated Report: Clean Water Act Sections 303(d) and 305(b)*. October 3, 2017.