Volume 1 of 3

EBMUD WATER TREATMENT AND TRANSMISSION IMPROVEMENTS PROGRAM

Draft Environmental Impact Report
SCH # 2005092019

East Bay Municipal Utility District

June 2006






ESA

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ACRONYMS

AB	Assembly Bill
ABAG	Association of Bay Area Governments
AC	Alameda-Contra Costa
ACCWP	Alameda Countywide Clean Water Program
ACGIH	American Conference of Governmental Industrial Hygienists
ADRP	Archaeological Data Recovery Program
ANSI	American National Standards Institute
APS	auxiliary power system
ASPIS	Abandoned Sites Program Information System
AST	above-ground storage tank
ASTM	ASTM International (formerly the American Society of Testing Materials)
ATCM	Airborne Toxic Control Measure
AWP	Annual Work Plan
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
BAT	best available technology
BCT	Best Conventional Pollutant Control Technology
BMPs	best management practices
BRS	Biennial Reporting System
CalARP	California Accidental Release Program
Cal-EPA	California Environmental Protection Agency
Cal/OSHA	California Occupational Health and Safety Administration
CAER	Community Awareness & Emergency Response
CAP	Clean Air Plan
CARB	California Air Resources Board
CBC	California Building Code
CCAP	California Cyptosporidium Action Plan
CCCSD	Central Contra Costa Sanitary District
CCCWP	Contra Costa Clean Water Program
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDMG	California Division of Mines and Geology
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CGS	California Geological Survey
CHMIRS	California Hazardous Materials Incident Reporting System
CIWMB	California Integrated Waste Management Board
cm/sec	centimeters per second
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level

CNPS	California Native Plant Society
CO	carbon monoxide
Corps	U.S. Army Corps of Engineers
CORTESE	Cortese Hazardous Waste and Substances Sites List
CPO	Chlorine-Produced Oxidants
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
CY	cubic yards
dB	decibel
dBA	A-weighted noise level in decibels
dbh	diameter at breast height
DBP	Disinfection Byproducts
DEHP	di (2ethylhexyl) phthalate
DHS	Department of Health Services
DOF	Department of Finance
DOI	U.S. Department of the Interior
DPM	diesel particulate matter
DSOD	Division of Safety of Dams
DTSC	Department of Toxic Substances Control
EBMUD	East Bay Municipal Utility District
EBRPD	East Bay Regional Park District
EDR	Environmental Data Resources
EIR	environmental impact report
EPCRA	Emergency Planning and Community Right-to-Know Program
ERNS	Emergency Response Notification System
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FFIS	Federal Facilities Information System
FINDS	Facility Index System
FURS	Federal Underground Injection Control
g	gravity
GIS	geographic information system
gpd/acre	gallons per day per acre
gpm	gallons per minute
GPS	geographic positioning system
HAA	haloacetic acid
HABS	Historic American Buildings Survey
HAZNET	Hazardous Waste Information System
HDPE	high-density polyethylene
HMBP	hazardous materials business plan
HMIRS	Hazardous Materials Information Reporting System
HSAA	Carpenter-Presley-Tanner Hazardous Substance Account Act
HWCL	California Hazardous Waste Control Law
Hz	hertz
in/sec	inches per second
I-580	Interstate 580
I-680	Interstate 680
I-980	Interstate 980
km	Kilometers
LAFCO	Local Agency Formation Commission

lbs/day	pounds per day
Ldn	day-night noise level
Leq	steady-state energy level
Lmax	maximum A-weighted sound level
LPC	Landmarks Preservation Commission
LUD	land use unit demands
LUST	leaking underground storage tank
M	magnitude
MCLs	Maximum Contaminant Levels
mg	million gallon(s)
mgd	million gallons per day
mg/kg	milligram per kilogram
mg/L	milligram per liter
MLTS	Material Licensing Tracking System
MM	Modified Mercalli
Mmax	maximum moment magitude
MMI	Modified Mercalli Intensity
mm/yr	millimeters per year
MOU	Memorandum of Understanding
mph	miles per hour
MRZs	Mineral Resource Zones
msl	mean sea level
MTBE	methyl tertiary-butyl ether
MTC	Metropolitan Transportation Commission
Mw	Moment Magnitude
NAAQS	national ambient air quality standards
NAHC	Native American Heritage Commission
NDMA	N-nitrosodimethlyamine
NEMA	National Electrical Manufactures Association
NFPA	National Fire Protection Association
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOP	notice of preparation
NOx	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List
NRCS	Natural Resources Conservation Service
O_3	ozone
OAP	Ozone Attainment Plan
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
pcf	pounds per cubic feet
PGA	peak ground acceleration
PGV	peak ground velocity
PG&E	Pacific Gas and Electric
PM	particulate matter
PM10	particulate matter (10 microns or less in diameter)
PM2.5	particulate matter (2.5 microns or less in diameter)
ppm	parts per million
PPV	peak particle velocity

PRC	Public Resources Code
psf	pounds per square feet
PZPP	Pressure Zone Planning Program
RCRA	Resource Conservation and Recovery Act
RMP	risk management plan
rms	root-mean-square
ROG	reactive organic gases
RWQCB	Regional Water Quality Control Board
SAAQS	state ambient air quality standards
SARA	Superfund Act and Reauthorization Act
SCADA	Supervisory Control and Data Acquisition System
SEP	Seismic Evaluation Program
SIP	State Implementation Plan
SMARA	Surface Mining and Reclamation Act
SO_2	sulfur dioxide
STLC	soluble threshold limit concentration
SVP	Society of Vertebrate Paleontology
SWAMP	Surface Water Ambient Monitoring Program
SWF/LF	Solid Waste Information System
SWPPP	stormwater pollution prevention plan
SWRCB	State Water Resources Control Board
TCLP	toxicity characteristic leaching procedure
TCMs	transportation control measures
THM	trihalomethanes
TMDL	Total Maximum Daily Loads
TLV	Threshold Limit Value
TRC	total residual chlorine
TRIS	Toxic Chemical Release Inventory System
TSCA	Toxic Substances Control Act
TTLC	total threshold limit concentration
TUC	Transportation Utility Corridor
UBC	Uniform Building Code
UCMP	University of California Museum of Paleontology
UFC	Uniform Fire Code
USB	Ultimate Service Boundary
USC	United States Code
USDA	U.S. Department of Agriculture
U.S. EPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USTs	underground storage tanks
UV	ultraviolet
UWMP	Urban Water Master Plan
VOC	volatile organic compound
WCMP	Water Conservation Master Plan
WDRS	Waste Discharge Requirements
WGCEP	Working Group on California Earthquake Probabilities
WTP	Water Treatment Plant
WTTIP	Water Treatment and Transmission Improvements Program
WTTMP	Water Treatment and Transmission Master Plan

SUMMARY

This chapter contains the following sections:

S.1 Introduction

This Draft Environmental Impact Report (EIR) assesses the potential impacts of the Water Treatment and Transmission Improvements Program (WTTIP) proposed by the East Bay Municipal Utility District (EBMUD).

This document has been prepared in accordance with the California Environmental Quality Act (CEQA) statutes and guidelines. EBMUD is the lead agency for this CEQA process. Inquiries about the project should be directed to:

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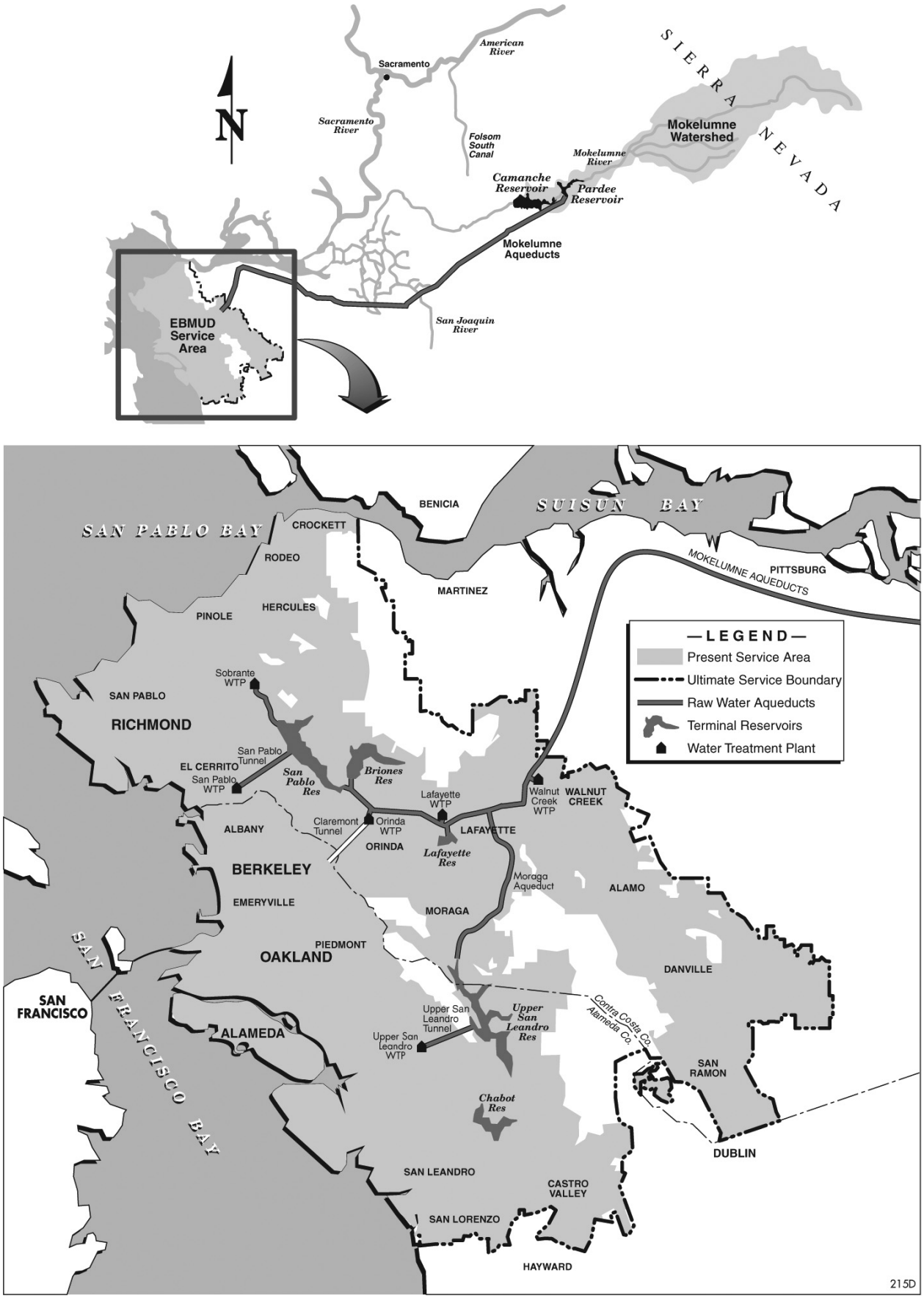
S.2 Project Background and Objectives

EBMUD provides water service to 20 incorporated cities and 15 unincorporated areas in Alameda and Contra Costa Counties. EBMUD's water system serves approximately 1.3 million people in a 325-square-mile area. The Oakland-Berkeley Hills divide EBMUD's service area into the West of Hills and East of Hills service areas. Figure S-1 shows the District's water service area, the water treatment plants, major raw water transmission facilities, and raw water reservoirs in the service area.



SOURCE: EBMUD

EBMUD Water Treatment and Transmission Improvements Program . 204369

Figure S-1
EBMUD Service Area

WTTIP improvements are driven by a variety of overlapping needs: meeting existing and future water demands in Lafayette, Orinda, Moraga (Lamorinda) and Walnut Creek; meeting future regulatory standards related to water quality; complying with environmental permit conditions; and replacing and upgrading aging infrastructure, as described in Section 2.2, of Chapter 2, Project Description. The objectives that were considered during development of WTTIP projects are detailed in Table S-1 below:

TABLE S-1
PROJECT OBJECTIVES

Category	Project Objectives
Reliability	▪ Provide reliable water treatment, transmission, and distribution infrastructure that meets long-term operational needs under average and maximum-day demand conditions ▪ Meet EBMUD standards for planned, unplanned, and emergency outages ▪ Meet security initiatives
Regulatory & Water Quality	▪ Continue to meet drinking water and environmental regulations with a margin of safety and achieve EBMUD internal long-term water quality goals
Operations	▪ Ensure project will meet short-term peak demand periods in excess of projected demands ▪ Minimize the risk of service disruption and meet demands during construction
Implementation	▪ Minimize implementation issues by considering the complexity of public and local agency issues
Environmental	▪ Minimize environmental impacts during construction ▪ Minimize environmental impacts after construction and during operations
Economics	▪ Minimize life-cycle costs (capital, operating, and maintenance) to EBMUD customers

S.3 Project Description

The WTTIP project consists of improvements at 5 water treatment plants (including, for one of the alternatives, construction of a new Orinda-Lafayette Aqueduct) and 19 other projects. See Table S-2 and Figure S-2 for a list of the projects and their locations. The projects are discussed at length in Sections 2.4, 2.5 and 2.6. **Table S-2 provides page references to each project's description (e.g., need, design, and construction characteristics) and its map code.** Project maps follow Chapter 2 and are organized by map type (A – street base, B –topographic base, C – aerial-photograph base, and D – design drawings). Some of these projects are evaluated in detail in the EIR while others are evaluated more generally, as explained in Section S.3.1. In addition, the EIR evaluates two alternatives:

- Alternative 1 – Supply from Orinda and Lafayette WTPs
- Alternative 2 – Supply from Orinda WTP

Section S.3.2 describes these alternatives.

TABLE S-2
WTTIP PROPOSED FACILITY LOCATIONS

Facility	Project Location	Address or Nearest Intersection	Page	Map Code
Lafayette Water Treatment Plant (WTP)[a]	Lafayette	3848 Mt. Diablo Boulevard	2-29	LWTP
Orinda WTP[a]	Orinda	190 Camino Pablo	2-42	OWTP
Walnut Creek WTP[a]	Walnut Creek	2201 Larkey Lane	2-47	WCWTP
Sobrante WTP[a]	Contra Costa County	5500 Amend Road	2-50	SOBWTP
Upper San Leandro WTP[a]	Oakland	7700 Greenly Drive	2-54	USLWTP
Orinda-Lafayette Aqueduct	Orinda/Lafayette	Tunnel from Orinda Sports Field near Orinda WTP to intersection of East Altarinda Drive and St. Stephens Drive; Pipeline: along El Nido Ranch Road from St. Stephens Drive to Mt. Diablo Boulevard, along Mt. Diablo Boulevard from El Nido Ranch Road to 3848 Mt. Diablo Boulevard	2-61	OLA
Project-Level Transmission and Distribution System Improvements Common to Both Alternatives				
Ardith Reservoir and Donald Pumping Plant[a]	Orinda	At existing Donald Pumping Plant near Ardith Drive and Westover Court	2-67	ARRES
Fay Hill Pumping Plant and Pipeline Improvements[a]	Moraga	Pumping Plant: southwest corner of intersection of Rheem Boulevard and Moraga Road; Pipeline: Rheem Boulevard west of Chalda Way	2-71	FHPP
Fay Hill Reservoir[a]	Moraga	At existing Fay Hill Reservoir site off of Fay Hill Road near Rheem Boulevard	2-72	FHRES
Glen Pipeline Improvements and Glen Reservoir Decommission[a]	Lafayette	Nordstrom Lane from Hilltop Drive to Glen Road, Glen Road from Nordstrom Lane to just west of Monticello Road; Monticello Road north of Presher Way	2-73	GLENPL
Happy Valley Pumping Plant and Pipeline	Orinda	Pumping Plant: on Lombardy Lane near Van Ripper Lane; Pipeline: from pumping plant southwest on Lombardy Lane to Miner Road, then southwest on Miner Road to Oak Arbor Road	2-74	HVPP
Highland Reservoir and Pipelines	Lafayette	Lafayette Reservoir Recreation Area; Pipeline: from reservoir to Mt. Diablo Boulevard	2-75	HIGHRES
Lafayette Reclaimed Water Pipeline	Lafayette	Lafayette WTP; Pipeline: from Lafayette WTP to Highland Reservoir overflow/drain pipeline	2-40	-- [b]
Leland Pressure Zone Isolation Bypass Valves[a]	Walnut Creek	Danville Boulevard near Rudgear Road	2-77	LELPL
Leland Isolation Pipeline	Walnut Creek	Lacassie Drive from North California Street to North Main Street	2-77	LELPL
Moraga Reservoir[a]	Moraga	At existing Moraga Reservoir near Draeger Drive and Claudia Court	2-78	MORRES

[a] Existing EBMUD facility.
[b] The Lafayette Reclaimed Water Pipeline would be co-located with other pipelines (refer to HIGHRES maps).
[c] No conceptual design has been completed for program-level facilities. Refer to topographic maps (Maps C) for facility locations.

TABLE S-2 (Continued)
WTTIP PROPOSED FACILITY LOCATIONS

Facility	Project Location	Address or Nearest Intersection	Page	Map Code
Moraga Road Pipeline	Lafayette/Moraga	Northern edge of Lafayette Reservoir Recreation Area, Moraga Road from Nemea Court/Madrone Drive to Draeger Drive	2-79	MORPL
Sunnyside Pumping Plant and Pipeline	Orinda/Lafayette	Pumping Plant: Happy Valley Road near Sundown Terrace; Pipeline: pumping plant to Happy Valley Road	2-81	SUNPP
Tice Pumping Plant and Pipeline	Contra Costa County	Pumping Plant: near Tice Valley Boulevard and Olympic Boulevard; Pipeline: from pumping plant across Olympic Boulevard, north on Boulevard Way to Warren Road	2-82	TICEPP
Withers Pumping Plant	Contra Costa County	At Grayson Reservoir near Reliez Valley Road and Silver Hill Way	2-83	WITHPP
Program-Level Transmission and Distribution System Improvements Common to Both Alternatives				
Leland Reservoir Replacement[a]	Lafayette	Opposite 1050 Leland Drive	2-85	-- [c]
New Leland Pressure Zone Reservoir and Pipeline	Walnut Creek / Contra Costa County	Reservoir: Caltrans property adjacent to I-680; Pipeline: from reservoir northwest to Danville Boulevard near Rudgear Road	2-85	NLELRES[c]
St. Mary's Road/Rohrer Drive Pipeline	Moraga / Lafayette / Walnut Creek	Tentative location: Moraga Road south from Draeger Drive to St. Mary's Road, northeast on St. Mary's Road to Rohrer Drive	2-86	-- [c]
San Pablo Pipeline	Orinda / Contra Costa County / Richmond	Tentative location: Orinda WTP east to Old San Pablo Dam Road to San Pablo Tunnel; through tunnel to San Pablo WTP	2-86	-- [c]

[a] Existing EBMUD facility.
[b] The Lafayette Reclaimed Water Pipeline would be co-located with other pipelines (refer to HIGHRES maps).
[c] No conceptual design has been completed for program-level facilities. Refer to topographic maps (Maps C) for facility locations.

S.3.1 Project and Program Evaluations

This EIR serves as a project EIR and a program EIR. Table S-2 indicates the proposed actions evaluated at a project level of detail (which will therefore, subject to approval by the EBMUD Board of Directors, be ready for implementation following necessary regulatory approvals) and the proposed actions evaluated at a program level of detail. Generally, program-level improvements are projects that EBMUD might implement sometime in the future, depending on (for example) changing water quality regulations, changing source water quality, and/or increases in demand for treated water; these projects have not been developed enough to permit a detailed evaluation. Consequently, the program-level elements are evaluated in a more general manner. In Chapter 3, impacts associated with these projects are discussed at the end of each technical section (e.g., Section 3.3, Visual Quality). The District will undertake further environmental review pursuant to CEQA following completion of conceptual design and prior to implementation as more details about the specific locations and construction characteristics of those projects are developed.

When the District undertakes subsequent environmental review for facilities evaluated at a program level of detail, the information contained in this EIR will be revisited to determine the accuracy and the adequacy of these evaluations. In accordance with criteria set forth in CEQA, this EIR can:

- Provide the basis in an Initial Study for determining whether a specific WTTIP project may have significant effects;
- Be incorporated by reference to deal with regional influences, secondary effects, cumulative impacts, alternatives, and other factors that apply to the WTTIP as a whole; and/or
- Focus subsequent environmental review to permit discussion solely of new effects or more adverse effects than those considered in this EIR.

S.3.2 Alternatives 1 and 2

This EIR evaluates two WTTIP alternatives at an equal level of detail. The fundamental difference between these alternatives is whether the Lafayette Water Treatment Plant (WTP) is retained and upgraded (Alternative 1) or decommissioned (Alternative 2). Table S-3 identifies the actions at each water treatment plant that are included in the alternatives.

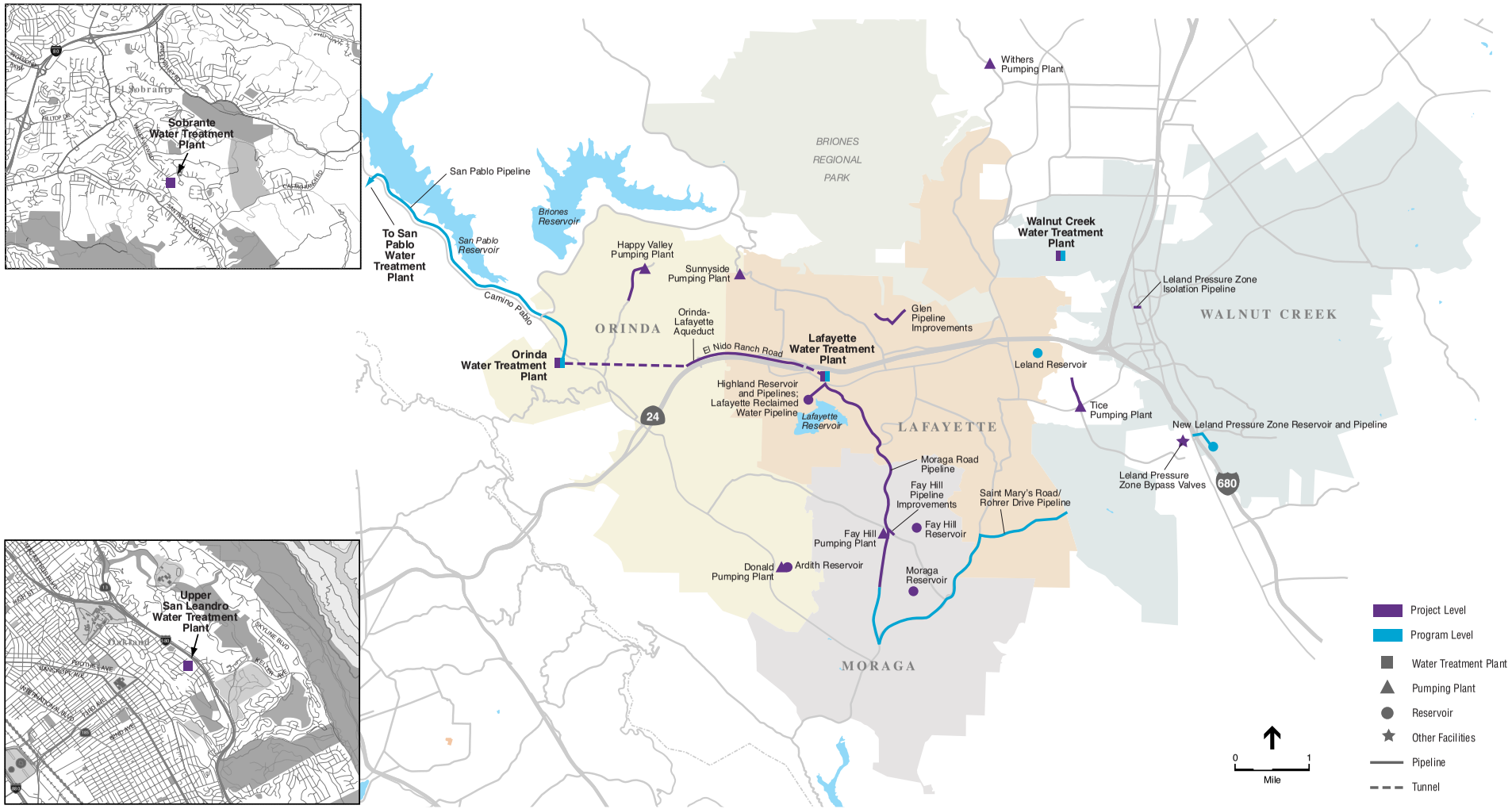
Alternative 1 – Supply from Orinda and Lafayette WTPs

This alternative involves retaining and upgrading the Lafayette WTP, as well as upgrading the Orinda, Sobrante, Walnut Creek, and Upper San Leandro WTPs. The proposed changes at these WTPs generally involve improvements to the raw water treatment processes, the backwash water treatment processes, treated water storage, and/or transmission. The components of Alternative 1 (EBMUD's preferred alternative) are presented in detail in Section 2.4.

Alternative 2 – Supply from Orinda WTP

This alternative involves decommissioning the Lafayette WTP. Customers currently served by the Lafayette WTP[1] would instead receive water from the Orinda WTP year-round. To accomplish this, EBMUD would modify Orinda WTP operations and construct a new treated water storage facility (clearwell), pumping plant, and combination tunnel/pipeline (referred to as the Orinda-Lafayette Aqueduct) to convey treated water to Lafayette for distribution. Proposed changes to the Sobrante, Walnut Creek, and Upper San Leandro WTPs would basically be the same as Alternative 1, although the proposed sizes of some facilities at the Sobrante and Upper San Leandro WTPs would be somewhat bigger.

[1] The areas served by the Lafayette WTP (during warm-weather demand conditions) include portions of Lafayette, Moraga, Orinda, and Walnut Creek.



SOURCE: East Bay Municipal Utility District; ESA

EBMUD Water Treatment and Transmission Improvements Program . 204369

Figure S-2
Project Location

TABLE S-3
SUMMARY OF WTTIP ALTERNATIVES 1 AND 2
WATER TREATMENT PLANT IMPROVEMENTS

Facility and Project	Alternative 1 (Preferred)		Alternative 2	
	Project Level	Program Level	Project Level	Program Level
Lafayette WTP				
Capacity[a]	Increase from 25 to 34 mgd		Decrease from 25 to zero mgd	
Clearwells	■			
Chlorine Contact Basin	■			
Backwash Water Recycle System[b]	■			
Sodium Hypochlorite Storage and Feed	■		■	
Raw Water Bypass Pipe	■			
Leland and Bryant Pumping Plants	■			
Electrical Substation	■			
Emergency Generator	■			
Lafayette Reclaimed Water Pipeline	■			
High-Rate Sedimentation Units		■		
Ultraviolet Light Disinfection		■		
Walter Costa Trail Relocation				
Orinda WTP				
Capacity[a]	175 mgd (no change)		No change, but plant would need to operate at 180 mgd during peak demand periods	
Backwash Water Recycle System[b]	■		■	
Clearwell[d]		■	■	■
Los Altos Pumping Plant No. 2			■	
San Pablo pumping plant and pipelines		■		■
Low Lift Pumping Plant		■		■
Orinda-Lafayette Aqueduct			■	
Electrical Substation		■	■	
Emergency Generator	■		■	
High-Rate Sedimentation Units		■		■
Chlorine Contact Basin		■		■
Ultraviolet Light Disinfection		■		■
Walnut Creek WTP[a]				
Capacity	Plant operating capacity would increase to 115 mgd[c]		Plant operating capacity would increase to 115 mgd[c]	
Leland Pumping Plant No. 2	■		■	
UV Disinfection		■		■
High-Rate Sedimentation Units		■		■
Sobrante WTP				
Ozone Upgrades	■		■	
Filter-to-Waste Equalization Basin	■		■	
Backwash Water Equalization Basin	■		■	
High-Rate Sedimentation Units	■		■	
Chlorine Contact Basin	■		■	
Upper San Leandro WTP				
Ozone Upgrades	■		■	
Filter-to-Waste Equalization Basin	■		■	

[a] WTP capacity values are for maximum-day operating capacity during warm-weather demand conditions.
[b] The backwash water recycle system may include the following facilities: filter-to-waste equalization basin, backwash water waste equalization basin, flocculation and sedimentations basins, UV disinfection building, solid storage tank and pumping plant, chemical storage and feed room, and electrical room.
[c] To meet peak-hour demands, the plant must operate up to 115 mgd for a few hours each day. Maximum daily demand remains at 96 mgd.
[d] Orinda WTP, Alternative 1, Program Level includes 2 clearwells

The proposed Orinda-Lafayette Aqueduct would convey treated water from the Orinda WTP to the transmission mains near the Lafayette WTP. The proposed alignment of the aqueduct generally parallels the existing Lafayette Aqueducts No. 1 and No. 2, which convey raw water from Lafayette to the Orinda WTP via gravity. The proposed aqueduct would operate under pressure. The Los Altos Pumping Plant No. 2 would pump treated water from the Orinda WTP to the distribution system currently served by the Lafayette WTP. The components of Alternative 2 are presented in detail in Section 2.5.

Projects Common to Both Alternatives

All of the other projects listed in Table S-2 are common to both the preferred Alternative 1, and Alternative 2, including:

- Ardith Reservoir and Donald Pumping Plant
- Fay Hill Pumping Plant and Pipeline Improvements
- Fay Hill Reservoir
- Glen Pipeline Improvements
- Glen Reservoir Decommission
- Happy Valley Pumping Plant and Pipeline
- Highland Reservoir and Pipelines
- Lafayette Reclaimed Water Pipeline
- Leland Pressure Zone Isolation Bypass Valves
- Leland Isolation Pipeline
- Moraga Reservoir
- Moraga Road Pipeline
- Sunnyside Pumping Plant and Pipeline
- Tice Pumping Plant and Pipeline
- Withers Pumping Plant
- Leland Reservoir Replacement[2]
- New Leland Pressure Zone Reservoir and Pipeline[2]
- St. Mary's Road/Rohrer Drive Pipeline[2]
- San Pablo Pipeline[2]

These components are presented in detail in Section 2.6.

S.3.3 Schedule

Tables 2-6, 2-8, and 2-9 in Chapter 2 present the proposed schedule for design and construction of upgrades for WTTIP projects under Alternative 1, Alternative 2, and those projects common to Alternatives 1 and 2, respectively. Table 2-7 presents the proposed work hours for all WTTIP projects.

Construction of all WWTIP projects would span 12 years (2007 to 2018); the construction schedules for some projects would overlap. The earliest project is expected to begin construction in the Spring of 2007 and the last project is expected to begin construction in late 2016. The first

[2] Program-level projects. See Section S.3.1 for further explanation.

program-level element (New Leland Pressure Zone Reservoir) is expected to begin construction in 2011, with construction of all other program-level projects expected to begin after 2015.

S.4 Summary of Impacts

Tables S-4 through S-9 at the end of this chapter present a summary of the environmental impacts associated with each project. The tables are organized by the city in which the projects are located, as follows:

- Table S-4 identifies the impacts associated with projects wholly or partially located in the **City of Lafayette**
- Table S-5 identifies the impacts associated with projects wholly or partially located in the **City of Orinda**
- Table S-6 identifies the impacts associated with projects wholly or partially located in the **Town of Moraga**
- Table S-7 identifies the impacts associated with projects located in the **City of Walnut Creek**
- Table S-8 identifies the impacts associated with the one project located in the **City of Oakland** (improvements at the Upper San Leandro WTP)
- Table S-9 identifies the impacts associated with projects in **unincorporated Contra Costa County**

The level of significance for each impact was determined using significance criteria (thresholds) developed for each category of impacts. For example, this EIR uses the definitions of protected or heritage trees for each of the above jurisdictions as criteria in evaluating the significance of tree removal or damage that could be caused by a WTTIP project.[3] The significance criteria are presented in the appropriate sections of Chapter 3. Significant impacts are those adverse environmental impacts that would meet or exceed the significance thresholds; less-than-significant impacts would not exceed the thresholds. **Tables S-4 through S-9 provide page references for a description of each impact associated with each project.** Table S-10 summarizes the measures to avoid, minimize, or otherwise reduce significant impacts at one or more of the WTTIP projects to less-than-significant levels.

[3] Tree protection standards vary by jurisdiction. As an example, the Town of Moraga protects trees with a single trunk diameter of 5 inches or more measured 3 feet above the natural grade or, if having multiple trunks, a total perimeter of 40 inches or more measured 3 feet above the natural grade. Protected trees include: (1) general trees (a tree other than a native tree, an orchard tree, or tree of historic significance); (2) native trees indigenous to the area, including California bay, oak, redwood (*Sequoia sempervirens*), toyon (*Heteromeles arbutifolia*), and knobcone pine (*Pinus attenuata*); (3) orchard trees (fruit or nut trees planted for commercial agricultural purposes); and (4) trees of historic significance (having historic value related to the heritage of the town and designated by action of the Town Council). For more information on all tree protection policies, see p.3.6-20.

S.4.1 Significant and Unavoidable Impacts

There are several impacts discussed in this EIR that are considered significant and unavoidable. These impacts have been identified for some projects in the areas of visual quality (altered visual appearance, see Section 3.3), biological resources (removal or loss of protected trees, see Section 3.6), and traffic (temporary loss of street access during construction, see Section 3.8). In addition, some of the indirect effects of growth resulting from implementation of the WTTIP as a whole (see Chapter 4) are considered significant and unavoidable. These impacts are discussed by resource area below. The individual projects that would result in potentially significant and unavoidable impacts are as follows:

- Glen Pipeline Improvements
- Happy Valley Pumping Plant and Pipeline
- Highland Reservoir and Pipelines
- Tice Pumping Plant and Pipeline

Visual Quality

The introduction of a new, partially buried tank on the Highland Reservoir site, and the removal of up to 35 mature trees would change the visual conditions considerably. The proposed project would add prominent new built structures that would appear in strong visual contrast to the natural landform and vegetation pattern. These changes would substantially alter the site's undeveloped oak woodland hillside appearance and even with implementation of a landscape plan as mitigation, this visual effect would remain significant.

The proposed Highland Reservoir as seen from a recreation trail in the Lafayette Reservoir Recreation Area would appear against a landscape backdrop and would be noticeable, although it would not be visually prominent. To some degree, its form and the graded terrain would contrast with the surrounding natural landscape. The removal of mature oak trees from the site would also be a noticeable visual change that would adversely affect this trail view. Within five years the proposed landscaping would provide some additional screening. However, given the degree of visual contrast between proposed project features and the natural landscape setting, and in light of City of Lafayette's policies regarding hillside and tree protection as well as District policies regarding visual quality at recreation sites, the effect on trail views is considered significant and unavoidable.

Removal of Protected Trees

Vegetation at the proposed site of the Highland Reservoir consists of non-native grassland, coyote brush, and numerous large-diameter (mostly 30 inches at standard height and greater) multi-stemmed oak trees within mixed oak woodland. Approximately 30 to 35 oak trees are proposed for removal at the reservoir site. All of these trees are considered protected under the City of Lafayette's tree ordinance. On the basis of the number of multi-stemmed, large-diameter native oak trees, this EIR analysis concludes that no measures can fully mitigate this loss and impacts to trees at the proposed reservoir site would be considered significant and unavoidable.

Traffic

There are roadways within proposed pipeline segments for which the construction zone would result in insufficient remaining width to maintain alternate one-way traffic flow. For example, segments of Nordstrom Lane, Glen Road, Miner Road, Lombardy Lane, and Boulevard Way (each 22 to 25 feet wide) would need to be closed to all through-traffic (except emergency vehicles) during work hours, with detour routing available in some, but not all, cases. Access impacts on the roads for which no detour routing is available would be significant and unavoidable. Similarly, roads for which no detour routing is available for public busses would also be significant and unavoidable. Affected bus lines include County Connection Bus Lines 126, 106 and 101, all subject to temporary road closure.

Growth

Implementation of the WTTIP as a whole would support an amount of growth that is consistent with regional growth projections, but there are potentially significant secondary effects from the project because it removes a potential obstacle to planned development. Some of these secondary effects of planned growth have been identified in documents prepared by the relevant land use jurisdictions as significant and unavoidable, while others are significant but mitigable. Significant unavoidable impacts that could occur as a result of planned growth include: loss of open space, traffic increases, degradation of air quality, and change in the visual character of the region.

S.4.2 Cumulative Impacts

Due to the breadth and extent of the WTTIP projects, this EIR provides an analysis both of the collective impacts of all project-level and program-level projects included in the WTTIP as well as the potential for overlap with other pertinent projects proposed and/or planned in the region. The collective impact discussion provides a synthesis of both project- and program-level impacts for all proposed WTTIP facilities described in Chapter 3, and indicates the potential for overlapping impacts associated with multiple projects proposed for construction within the same time frame and same geographic area. The most noteworthy of these cumulative impacts are loss of protected trees, traffic, increases in dust and other air quality pollutant emissions, and elevated noise levels. These and all other cumulative impacts are summarized below and discussed more fully in Chapter 5.

Protected Trees

Chapter 3, Section 3.6 presents the potential impacts of each WTTIP facility on biological resources. With the exception of impacts to protected trees at the Highland Reservoir, all identified impacts would be either less than significant or less than significant locally with implementation of proposed mitigation measures.

As described in Table 3.6-4 (p. 3.6-26) and Impact 3.6-1, the total number of protected trees that would be removed at all sites would be approximately 200 to 280 trees under either Alternative 1 or 2. In addition, more trees could be damaged during project construction. At the Highland Reservoir site, removal of 30 to 35 multi-stemmed, large-diameter protected oak trees was

determined to be a significant and unavoidable local impact. When considered collectively within the geographic scope of the proposed project and with implementation of proposed mitigation (e.g., tree replacement), the number of protected trees to be removed at all sites combined, including the Highland Reservoir site, would not represent a substantial portion of the protected trees present in the surrounding 925-acre Lafayette Reservoir Recreation Area, or the program area as a whole. Therefore, the removal of protected trees under the WTTIP projects collectively or cumulatively (with implementation of proposed mitigation) with other projects would not be considered significant.

Traffic

As described in Chapter 3, Section 3.8, implementation of the WTTIP would result in potential impacts on traffic and circulation, including increased construction vehicles and traffic delays, loss of parking, traffic safety issues, access disruption, transit disruption, and roadway wear and tear. With the exception of impacts associated with the lack of detour routing, all identified impacts would be less than significant or could be mitigated to a less-than-significant level.

On the basis of the proposed construction scheduling of specific facility projects, simultaneous (overlapping) construction is likely to occur for multiple WTTIP facilities. The implication of overlapping construction pertains to the potential for construction-generated traffic for more than one facility to use the same road(s); that is, the total number of vehicle trips added to the common route(s) due to concurrent construction of multiple projects could be cumulatively higher than the maximum number of daily and hourly vehicle trips used to determine impacts of a single facility project. However, the period of time of maximum trip generation would vary among the facility projects, and therefore, the maximum traffic flows on the common route(s) would not necessarily be the sum of the maximum trips generated by the overlapping projects. Nonetheless, so as to not underestimate the potential traffic and circulation impacts resulting from simultaneous construction projects, those impacts were assessed assuming that the maximum trips generated by the overlapping projects would occur at the same time.

Examples of simultaneous use of roads by construction workers and trucks for more than one facility project (based on proposed construction scheduling) are the following:

- *Camino Pablo* (two-lane section north of Miner Road): Traffic generated by construction at the Orinda WTP (Alternative 2) and the Orinda-Lafayette Aqueduct (Alternative 2) (tunnel portion) would use this road during the years 2015–2017. The impact determination for the overlapping use of the two-lane Camino Pablo would be the same (less than significant with mitigation) as for the Orinda WTP (Alternative 2) or Orinda-Lafayette Aqueduct (Alternative 2) (tunnel portion) alone.

- *Camino Pablo* (four-lane section between Highway 24 and Miner Road): Traffic generated by construction for the Orinda WTP (Alternative 1) and Happy Valley Pumping Plant and Pipeline projects would both use this road during the years 2011–2013. The impact determination for the overlapping use of the four-lane Camino Pablo would be the same (less than significant with mitigation) as for the Orinda WTP (Alternative 1) or Happy Valley Pumping Plant and Pipeline projects alone.

- *Acalanes Road* (El Nido Ranch Road to Mt. Diablo Boulevard): Traffic generated by construction at the Lafayette WTP (Alternative 1) and the Sunnyside Pumping Plant would both use this road during the years 2012–2013. The impact determination for the overlapping use of this section of Acalanes Road would be the same (less than significant with mitigation) as for the individual project elements alone.

- *Moraga Road* (Mt. Diablo Boulevard to Rheem Boulevard): Traffic generated by construction for the Fay Hill Pumping Plant and Pipeline and the Moraga Reservoir projects would both use this road during the years 2016–2017. The impact determination for the overlapping use of this section of Moraga Road would be the same (less than significant with mitigation) as for the Fay Hill Pumping Plant and Pipeline project or Moraga Reservoir project alone.

- *El Nido Ranch Road* (Highway 24 to Upper Happy Valley Road): Traffic generated by construction of the Orinda-Lafayette Aqueduct (tunnel portion) and the Sunnyside Pumping Plant would use this road, but not at the same time, so there would be no additive (overlapping) impacts.

Collectively, the traffic and circulation impacts resulting from implementation of the WTTIP as a whole would be less than significant.

Air Quality

All potential air quality impacts associated with WTTIP facilities, as described in Chapter 3, Section 3.9, would be less than significant or could be mitigated to a less-than-significant level. Potential air quality impacts include increases in dust and equipment emissions during construction, exposure to diesel particulates, emissions from ventilation fans, operational emissions, odors, and secondary emissions from power use.

As described in Impact 3.9-1, construction emissions associated with implementation of all WTTIP projects would span 12 years (2007 to 2018), and projects with overlapping construction schedules would have the potential for combined emissions in the same air basin. Total WTTIP-related average dust emissions are estimated to be 105 and 139 pounds per day under Alternatives 1 and 2, respectively (see p. 3.9-12). Due to the extended schedule of the combined WTTIP projects, a comparison of estimated dust emissions of the combined projects to the Bay Area Air Quality Management District's (BAAQMD) operational significance criterion of 80 pounds per day for dust would be exceeded between 2011 and 2018 under Alternative 2, and possibly on occasion under Alternative 1 when peak earthmoving activities occur. Similarly, for construction equipment exhaust emissions, the combined WTTIP construction activities would have the potential to exceed the BAAQMD's significance criteria for carbon monoxide and nitrogen oxide between 2007 and 2018. Due to this combined or collective impact, supplemental mitigation measures, as described in Measure 3.9-1, would be required to reduce impacts to a less-than-significant level.

Impact 3.9-2 describes the potential for exposure of sensitive receptors to short-term increases in diesel particulates along truck haul routes during project construction. This impact was determined to be less than significant at all WTTIP project sites under Alternative 1; even with

overlapping construction schedules and overlapping haul routes for multiple WTTIP projects, the potential impact would still be less than significant. For Alternative 2, there is some potential for daily combined truck trip volumes to exceed threshold levels between 2015 and 2018. However, implementation of Measure 3.9-2 (haul route coordination and scheduling) would reduce this impact to a less-than-significant level.

Impact 3.9-3 relates to potential air pollutant emissions from ventilation fans and pertains only to tunneling. This site-specific impact could be mitigated to a less-than-significant level, and there would be no collective impact, since proposed tunneling activities would be limited to the Orinda-Lafayette Aqueduct.

Operational air quality impacts, described in Impacts 3.9-4, 3.9-5, and 3.9-6, would all be less than significant with no mitigation required at any of the project sites. Therefore, the collective operational air quality impacts resulting from implementation of the WTTIP as a whole would be less than significant.

Noise

Chapter 3, Section 3.10, identifies potential noise and vibration impacts associated with construction and operation of WTTIP project facilities. As described in Impacts 3.10-1 and 3.10-2, at most locations construction noise impacts would be mitigated to a level consistent with daytime and nighttime noise ordinance limits; in most cases, if feasible noise controls are implemented, construction noise levels at the closest sensitive receptors could be reduced to below the speech interference criterion. The exceptions would be for construction activities associated with the Orinda-Lafayette Aqueduct, Glen Pipeline, Happy Valley Pipeline, Moraga Road Pipeline, Tice Pipeline, Highland Reservoir, Happy Valley Pumping Plant, and Leland Pressure Zone Isolation Bypass Valve. Implementation of noise controls (Measure 3.10-1a), time limits (Measure 3.10-1b), and use of temporary sound barriers (Measure 3.10-1e) would reduce potential construction impacts to a less-than-significant level, although mitigated construction noise could still cause occasional disturbance at the closest noise-sensitive receptors.

Construction noise impacts identified for each facility were evaluated with respect to site-specific conditions, including ambient noise levels and distance to closest receptors. Most construction noise impacts would be facility-specific. Overlapping noise impacts would be limited to impacts along haul routes where overlapping construction schedules for multiple WTTIP facilities could result in combined noise increases from increased truck traffic. Collective noise increases associated with simultaneous use of roads by haul trucks for more than one facility project (based on proposed construction scheduling) would include the following:

- *Camino Pablo* (north of Miner Road), *Moraga Road* (Mt. Diablo Boulevard to Rheem Boulevard), and *Moraga Way* (Highway 24 to Ivy Drive): Estimated haul-truck-related noise levels would be 64 to 66 dBA (Leq), which is not expected to result in noticeable noise increases on these road segments. Truck-related noise increases would not noticeably increase ambient noise levels. In addition, these temporary noise increases would only occur during the less noise-sensitive, daytime weekday hours.

- *Camino Pablo* (Highway 24 to Miner Road), *Mt. Diablo Boulevard* (Acalanes Road to east of the Lafayette Reservoir Recreation Area), *Acalanes Road* (El Nido Ranch Road to Mt. Diablo Boulevard), *Rheem Boulevard* (Moraga Road to Chalda Way), *Deer Hill Road* (Highway 24 to Oak Hill Road), and *Oak Hill Road* (Highway 24 to Mt. Diablo Boulevard): Estimated haul-truck-related noise levels would range between 62 and 65 dBA (Leq), which would not be expected to result in noticeable noise increases on these road segments. Collective traffic increases on these road segments are not expected to result in significant noise impacts on sensitive receptors.

- *Ardith Drive* (Ivy Drive to Ardith Reservoir site), and *Ivy Drive* (Moraga Road to Ardith Drive): Estimated haul-truck-related noise levels would be 65 dBA (Leq), which could result in noticeable noise increases on these residential streets, where noise levels are expected to be 60 dBA (Ldn) or less. However, these temporary maximum noise increases would occur for a limited amount of time (three to six weeks if the excavation and backfilling phases were to overlap). Potential collective noise increases would be less during the remainder of construction. In addition, these temporary truck-related noise increases would only occur during the less noise-sensitive, daytime weekday hours, and noise levels are not expected to exceed the 70-dBA speech interference criterion at adjacent residences.

S.5 Analysis of Alternatives

Chapters 2 through 5 of this EIR present detailed evaluations of Alternative 1 – Supply from Orinda and Lafayette WTPs (the preferred alternative) and Alternative 2 – Supply from the Orinda WTP; Chapter 6 describes and evaluates other alternatives to the WTTIP (including the required No Project Alternative), describes the alternatives screening process and alternatives eliminated from consideration, and compares the environmental merits of the alternatives.

The WTTIP is the result of a six-year planning effort that entailed consideration of over 60 alternatives. Sources of alternatives to be considered included background reports prepared for the WTTIP (described in Section 6.10), suggestions made in responses to the notice of preparation (NOP) and at public meetings held for the WTTIP, and EIR preparers (based on the environmental impacts described in Chapter 3). Table 6-1 (p.6-3) lists the alternatives considered, indicates whether the alternatives are evaluated in the EIR or were eliminated, and the source of the alternative. Numerous alternatives were eliminated from consideration based on inability to meet most of the project's basic objectives, infeasibility, or inability to reduce the project's environmental impacts. Those alternatives retained for consideration (in addition to Alternatives 1 and 2) are presented in Sections 6.3 through 6.9. The alternatives screening process, alternatives eliminated and the reasons for their elimination are discussed in Section 6.10.

Many of the same significant impacts would occur under Alternative 1 or Alternative 2 because those impacts are associated with projects common to both alternatives. All of the impacts determined to be unavoidable would occur under either alternative because those impacts are associated with the Highland Reservoir project (impacts to visual quality and biological resources); and Tice, Happy Valley, and Glen pipelines (temporary, construction-phase impacts related to available width of traffic lanes, vehicular access, and transit service).

However, there are several important differences between the potential impacts and extent of required mitigation measures associated with the two alternatives. The differences primarily reflect the fact that the Orinda-Lafayette Aqueduct project would only be associated with Alternative 2 and thus that project's impacts over a one- to two-year period would be avoided under Alternative 1. Although the tunneling proposed as part of the Orinda-Lafayette Aqueduct project would avoid surface-disturbance impacts associated with open-trench construction, it would concentrate impacts at the tunnel entry shaft (and, to a lesser extent, the exit shaft), and there are some impacts unique to tunneling, including noise associated with 24-hour construction and groundborne vibration. The total areal extent of construction also would be greater under Alternative 2 than under Alternative 1 because of the Orinda-Lafayette Aqueduct.

Other differences between the alternatives relate to the impacts to, and sensitivities of, the areas immediately surrounding the Orinda WTP and Lafayette WTP sites. There are a greater number of residences closer to the Orinda WTP than is the case at the Lafayette WTP. There are about twice as many residences within 1,000 feet of the Orinda WTP as there are within 1,000 feet of the Lafayette WTP. The Lafayette WTP backs up to Highway 24, and the open space of the Lafayette Reservoir Recreation Area lies to the south, across Mt. Diablo Boulevard. Mt. Diablo Boulevard itself, because of its breadth near the Lafayette WTP, provides something of a buffer from other nearby residential areas, although this is also partially the case along the west side of the Orinda WTP, adjacent to Camino Pablo.

The more extensive construction footprints and greater excavation and grading requirements associated with Alternative 2 -- about 680,000 cubic yards of excavation, compared to about 445,000 cubic yards of excavation for Alternative 1 -- would result in incrementally greater construction-phase air emissions (e.g. approximately 139 lbs/day of PM10 emissions under Alternative 2 versus about 105 lbs/day under Alternative 1). In both cases, those emissions can be mitigated to a less-than-significant level.

Potential cumulative construction traffic added to Camino Pablo (two-lane section north of Miner Road) would be incrementally greater under Alternative 2 than Alternative 1 (about three percent above existing traffic volumes under Alternative 2 and one percent above existing traffic volumes under Alternative 1). In both cases the increases would fall within the typical daily traffic volume fluctuations. Conversely, potential cumulative construction traffic added to Acalanes Road (El Nido Ranch Road to Mt. Diablo Boulevard) would represent about a five percent increase above existing traffic volumes and would only occur under Alternative 1. Cumulative truck traffic resulting from potentially overlapping WTTIP projects, and associated diesel particulate emissions, would also be incrementally greater under Alternative 2 than under Alternative 1, although the analytic threshold (600 truck trips per day) would not likely be exceeded along any particular haul route under either alternative.

There would be fewer (15-20) protected trees potentially removed under Alternative 1 than under Alternative 2, primarily because more protected trees would be removed to upgrade and expand the Lafayette WTP than would be required to upgrade and expand the Orinda WTP. There would be somewhat more (20-30) protected trees potentially damaged under Alternative 2, owing

primarily to the Orinda-Lafayette Aqueduct project, although the degree of damage is unknown and may be quite limited in many cases (e.g. tree limb loss).

For these reasons, Alternative 1 is considered environmentally superior to Alternative 2.

The No Project Alternative would neither meet the needs addressed by the WTTIP nor satisfy the project objectives. In the short term, the No Project Alternative would be environmentally superior to either "action" alternative because none of the impacts associated with those alternatives would occur. However, as described in Section 6.2, a continuation of existing conditions would become untenable, and the District would eventually have to implement projects to address the purpose and need identified for the WTTIP. This situation could, in turn, result in environmental effects that could be worse than those of either Alternative 1 or 2 in the long term.

S.6 Issues to be Resolved

At a regularly scheduled meeting presently anticipated to take place in the fall of 2006, the EBMUD Board of Directors will consider certification of this EIR as complete and adequate and will then consider approval of the proposed project. Issues to be resolved for WTTIP projects include:

- *Selection of an Alternative*. The District Board of Directors will select Alternative 1 or Alternative 2 for implementation when it approves the project and adopts Findings as required under CEQA.

- *Decisions to Implement Potential Program-level Improvements*. The need for high-rate sedimentation and ultraviolet disinfection processes at the water treatment plants would be determined in the future, subsequent to Board action on project-level WTTIP elements, based on regulatory requirements. Likewise, the need to construct the program-level clearwells and San Pablo Pumping Plant and Pipeline at and from the Orinda WTP would be determined in the future, based on further consideration of water management strategies. In the future, EBMUD will need to implement the Saint Mary's Road/Rohrer Drive Pipeline, New Leland Pressure Zone Reservoir, and Leland Reservoir Replacement projects. As part of implementation of these various projects, EBMUD would conduct the necessary site evaluation, design, environmental review and permitting activities before beginning construction.

Numerous issues of concern were raised through the scoping and public meetings conducted in association with circulation of the NOP's, and are addressed through the discussions of impacts, mitigation measures and alternatives presented throughout this EIR.

S.7 Organization of This EIR

This Draft EIR has been organized into the following sections:

1. **Introduction.** This chapter discusses the CEQA process and the purpose of the EIR.

2. **Project Description.** This chapter provides an overview of the WTTIP, describes the need for and objectives of the WTTIP projects, and describes in detail proposed design, construction, and operating characteristics. The maps for this EIR are presented after Chapter 2, and are organized by map type and by project.

3. **Environmental Setting, Impacts, and Mitigation Measures.** This chapter presents a description of the physical and regulatory setting of the WTTIP and identifies the criteria to be applied for determining impact significance, describes impacts that could result from implementation of the WTTIP projects, and identifies measures to mitigate those impacts. This chapter is divided into sections addressing various environmental issue areas (land use, planning and recreation; visual quality; etc.). Project-level evaluations of WTTIP projects are provided first in the discussion of impacts and mitigations, with the program elements addressed at the end of each environmental issue section.

4. **Growth Inducement Potential and Secondary Effects of Growth.** This chapter analyzes the potential for implementation of the WTTIP to remove obstacles to urban development and identifies secondary environmental effects potentially caused by growth.

5. **Cumulative Impacts.** This chapter (a) presents a discussion of the combined or overlapping impacts that could result from implementation of WTTIP projects that are temporally and spatially proximate; (b) identifies and describes other EBMUD projects, as well as projects proposed by others, that could contribute to significant cumulative impacts; and (c) indicates the potential for implementation of the WTTIP in combination with other projects to contribute to significant cumulative impacts.

6. **Analysis of Alternatives.** This chapter describes and evaluates other alternatives to the WTTIP (including the required No Project Alternative), describes the alternatives screening process and alternatives eliminated from consideration, and compares the environmental merits of the alternatives.

7. **Report Preparers.** This chapter identifies those involved in preparing this Draft EIR.

TABLE S-4
WATER TREATMENT AND TRANSMISSION IMPROVEMENTS PROGRAM – PROJECTS IN LAFAYETTE: SUMMARY OF IMPACTS

Impacts[a]	Lafayette WTP				Orinda-Lafayette Aqueduct[b] (Alternative 2 only)		Lafayette Reclaimed Water Pipeline		Glen Pipeline Improvements		Highland Reservoir and Pipelines		Moraga Road Pipeline[c]		Sunnyside Pumping Plant and Pipeline[b]	
	Alternative 1	Described on page	Alternative 2	Described on page		Described on page		Described on page		Described on page		Described on page		Described on page		Described on page
Land Use, Planning, and Recreation																
Divide an Established Community	LTS	3.2-14	--	3.2-14	LTS	3.2-14	LTS	3.2-14	LTS	3.2-14	LTS	3.2-14	LTS	3.2-14	LTS	3.2-14
Agricultural Resources Impacts	--	3.2-16	--	3.2-16	--	3.2-16	LTS	3.2-16	--	3.2-16	LTS	3.2-16	LTS	3.2-16	LTS	3.2-16
Recreation Resources Impacts	LTS	3.2-17	LTS	3.2-17	LTS	3.2-17	LTS	3.2-18	--	3.2-16	LTS	3.2-18	LTS	3.2-18	--	3.2-16
Visual Quality																
Short-Term Visual Effects during Construction	LTS	3.3-23	LTS	3.3-23	LTS	3.3-23	LTS	3.3-23	LTS	3.3-23	LTS	3.3-19	LTS	3.3-23	LTS	3.3-19
Alteration of Appearance of WTTIP Sites	SM	3.3-24	SM	3.3-25	LTS	3.3-29	SM	3.3-32	LTS	3.3-30	SU	3.3-31	SM	3.3-33	SM	3.3-33
Effects on Views	SM	3.3-36	SM	3.3-38	LTS	3.3-41	SM	3.3-44	LTS	3.3-42	SU	3.3-42	SM	3.3-44	SM	3.3-45
Effects on Scenic Vista	LTS	3.3-46	LTS	3.3-46	LTS	3.3-46	LTS	3.3-46	LTS	3.3-46	SU	3.3-46	LTS	3.3-46	LTS	3.3-46
New Sources of Light and Glare	SM	3.3-47	LTS	3.3-47	SM	3.3-47	SM	3.3-47	LTS	3.3-47	SM	3.3-47	LTS	3.3-47	SM	3.3-47
Geology, Soils, and Seismicity																
Slope Stability	LTS	3.4-22	LTS	3.4-22	SM	3.4-22	SM	3.4-24	LTS	3.4-23	SM	3.4-16	SM	3.4-16	SM	3.4-25
Groundshaking	SM	3.4-26	SM	3.4-26	SM	3.4-26	SM	3.4-26	SM	3.4-26	SM	3.4-26	SM	3.4-26	SM	3.4-26
Expansive Soils	SM	3.4-27	SM	3.4-27	SM	3.4-27	SM	3.4-27	SM	3.4-27	SM	3.4-27	SM	3.4-27	SM	3.4-27
Liquefaction	SM	3.4-28	LTS	3.4-29	SM	3.4-29	SM	3.4-30	SM	3.4-30	SM	3.4-30	LTS	3.4-31	LTS	3.4-31
Ground Squeezing	--	3.4-32	--	3.4-32	SM	3.4-32	--	3.4-32	--	3.4-32	--	3.4-32	--	3.4-32	--	3.4-32
Hydrology and Water Quality																
Degradation of Water Quality during Construction	SM	3.5-26	SM	3.5-27	SM	3.5-28	SM	3.5-30	SM	3.5-29	SM	3.5-29	SM	3.5-30	SM	3.5-31
Groundwater Dewatering	LTS	3.5-32	--	3.5-32	LTS	3.5-33	LTS	3.5-34	LTS	3.5-34	LTS	3.5-34	LTS	3.5-35	--	3.5-35
Diversion of Flood Flows	--	3.5-35	--	3.5-35	SM	3.5-35	--	3.5-35	--	3.5-35	--	3.5-35	SM	3.5-35	--	3.5-35
Discharge of Chloraminated Water during Construction	LTS	3.5-36	LTS	3.5-36	LTS	3.5-36	--	3.5-36	--	3.5-36	--	3.5-36	--	3.5-36	--	3.5-36
Operational Discharge of Chloraminated Water	LTS	3.5-37	--	3.5-37	--	3.5-37	LTS	3.5-38	--	3.5-37	LTS	3.5-38	--	3.5-37	--	3.5-37
Change in Impervious Surfaces	LTS	3.5-43	LTS	3.5-43	LTS	3.5-43	LTS	3.5-44	LTS	3.5-44	SM	3.5-44	LTS	3.5-44	LTS	3.5-44

[a] Impacts summarized; please see Chapter 3 for details. Does not include program-level elements. See Table S-10 for mitigation measures.
[b] These projects are in multiple jurisdictions (Lafayette and Orinda).
[c] This project is in multiple jurisdictions (Lafayette and Moraga).

LTS = Less Than Significant
SM = Significant and Mitigable
SU = Significant and Unavoidable
-- = Impact does not apply

TABLE S-4 (Continued)
WATER TREATMENT AND TRANSMISSION IMPROVEMENTS PROGRAM – PROJECTS IN LAFAYETTE: SUMMARY OF IMPACTS

Impacts[a]	Lafayette WTP				Orinda-Lafayette Aqueduct[b] (Alternative 2 only)		Lafayette Reclaimed Water Pipeline		Glen Pipeline Improvements		Highland Reservoir and Pipelines		Moraga Road Pipeline[c]		Sunnyside Pumping Plant and Pipeline[b]	
	Alternative 1	Described on page	Alternative 2	Described on page		Described on page		Described on page		Described on page		Described on page		Described on page		Described on page
Biological Resources																
Loss of or Damage to Protected Trees	SM	3.6-24	--	3.6-24	SM	3.6-24	SM	3.6-24	SM	3.6-24	SU	3.6-24	SM	3.6-24	SM	3.6-24
Degradation to Streams, Wetlands, and Riparian Habitats	SM	3.6-34	--	3.6-34	SM	3.6-36	SM	3.6-35	SM	3.6-37	SM	3.6-38	SM	3.6-39	--	3.6-34
Loss of or Damage to Special-Status Plants	SM	3.6-41	--	3.6-41	--	3.6-41	SM	3.6-41	SM	3.6-41	SM	3.6-41	SM	3.6-41	--	3.6-41
Disturbance to Special-Status Birds	SM	3.6-43	SM	3.6-43	SM	3.6-46	SM	3.6-47	SM	3.6-47	SM	3.6-47	SM	3.6-48	SM	3.6-49
Disturbance to Special-Status Bats	SM	3.6-51	SM	3.6-51	SM	3.6-53	SM	3.6-54	SM	3.6-54	SM	3.6-54	SM	3.6-55	SM	3.6-55
Disturbance to San Francisco Dusky-Footed Woodrat	SM	3.6-56	--	3.6-56	SM	3.6-57	SM	3.6-56	SM	3.6-58	SM	3.6-58	SM	3.6-58	--	3.6-56
Degradation of Special-Status Aquatic Species Habitat	SM	3.6-59	--	3.6-59	SM	3.6-61	SM	3.6-62	SM	3.6-61	SM	3.6-62	SM	3.6-62	--	3.6-63
Disruption to Wildlife Corridors	LTS	3.6-67	--	3.6-67	LTS	3.6-68	LTS	3.6-69	LTS	3.6-68	LTS	3.6-68	LTS	3.6-69	LTS	3.6-69
Cultural Resources																
Archaeological Resources, including Unrecorded Cultural Resources	SM	3.7-17	SM	3.7-17	SM	3.7-17	SM	3.7-17	SM	3.7-17	SM	3.7-17	SM	3.7-17	SM	3.7-17
Paleontological Resources	SM	3.7-25	SM	3.7-25	SM	3.7-25	SM	3.7-25	SM	3.7-25	SM	3.7-25	SM	3.7-25	SM	3.7-25
Historic Settings	LTS	3.7-26	LTS	3.7-26	--	3.7-26	LTS	3.7-26	--	3.7-26	LTS	3.7-26	LTS	3.7-26	--	3.7-26
Traffic and Circulation																
Increased Traffic	SM	3.8-11	SM	3.8-11	SM	3.8-11	SM	3.8-11	SM	3.8-11	SM	3.8-11	SM	3.8-11	SM	3.8-11
Reduced Road Width	SM	3.8-18	SM	3.8-18	SM	3.8-18	SM	3.8-18	SU	3.8-18	SM	3.8-18	SM	3.8-16	--	3.8-15
Parking	SM	3.8-19	SM	3.8-19	SM	3.8-19	SM	3.8-19	SM	3.8-19	SM	3.8-19	SM	3.8-19	LTS	3.8-19
Traffic Safety	SM	3.8-20	SM	3.8-20	SM	3.8-20	SM	3.8-20	SM	3.8-20	SM	3.8-20	SM	3.8-20	SM	3.8-20
Access	--	3.8-20	--	3.8-20	SM	3.8-20	LTS	3.8-20	SU	3.8-21	LTS	3.8-20	SM	3.8-20	--	3.8-20
Transit	--	3.8-21	--	3.8-21	SM	3.8-21	LTS	3.8-21	--	3.8-21	LTS	3.8-21	SM	3.8-22	--	3.8-21
Pavement Damage/Wear	LTS	3.8-22	LTS	3.8-22	LTS	3.8-22	LTS	3.8-22	SM	3.8-22	LTS	3.8-22	LTS	3.8-22	LTS	3.8-22
Air Quality																
Construction Emission	SM	3.9-15	SM	3.9-15	SM	3.9-18	SM	3.9-21	SM	3.9-20	SM	3.9-21	SM	3.9-22	SM	3.9-22
DPM Emissions Along Haul Routes	LTS	3.9-25	LTS	3.9-25	LTS	3.9-25	LTS	3.9-25	LTS	3.9-25	LTS	3.9-25	LTS	3.9-25	LTS	3.9-25
Tunnel-Related Emissions	--	3.9-28	--	3.9-28	SM	3.9-28	--	3.9-28	--	3.9-28	--	3.9-28	--	3.9-28	--	3.9-28

[a] Impacts summarized; please see Chapter 3 for details. Does not include program-level elements. See Table S-10 for mitigation measures.
[b] These projects are in multiple jurisdictions (Lafayette and Orinda).
[c] This project is in multiple jurisdictions (Lafayette and Moraga).

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SM = Significant and Mitigable
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-- = Impact does not apply

TABLE S-4 (Continued)
WATER TREATMENT AND TRANSMISSION IMPROVEMENTS PROGRAM – PROJECTS IN LAFAYETTE: SUMMARY OF IMPACTS

Impacts[a]	Lafayette WTP				Orinda-Lafayette Aqueduct[b] (Alternative 2 only)		Lafayette Reclaimed Water Pipeline		Glen Pipeline Improvements		Highland Reservoir and Pipelines		Moraga Road Pipeline[c]		Sunnyside Pumping Plant and Pipeline[b]	
	Alternative 1	Described on page	Alternative 2	Described on page		Described on page		Described on page		Described on page		Described on page		Described on page		Described on page
Air Quality (cont.)																
Operational Pollutant Emissions at Treatment Facilities	LTS	3.9-29	LTS	3.9-31	--	3.9-29	--	3.9-29	--	3.9-29	--	3.9-29	--	3.9-29	--	3.9-29
Operational Odor Emissions	LTS	3.9-32	LTS	3.9-32	LTS	3.9-32	LTS	3.9-32	LTS	3.9-32	LTS	3.9-32	LTS	3.9-32	LTS	3.9-32
Secondary Emissions from Electricity Generation	LTS	3.9-33	LTS	3.9-33	LTS	3.9-33	LTS	3.9-33	LTS	3.9-33	LTS	3.9-33	LTS	3.9-33	LTS	3.9-33
Noise and Vibration																
Construction Noise Increases	SM	3.10-17	SM	3.10-17	SM	3.10-20	SM	3.10-26	SM	3.10-25	SM	3.10-25	SM	3.10-28	SM	3.10-29
Noise Increases Along Haul Routes	LTS	3.10-35	LTS	3.10-36	LTS	3.10-37	LTS	3.10-37	LTS	3.10-37	LTS	3.10-37	LTS	3.10-37	LTS	3.10-37
Construction-Related Vibration Effects	SM	3.10-38	SM	3.10-38	SM	3.10-39	LTS	3.10-38	LTS	3.10-38	LTS	3.10-38	SM	3.10-38	LTS	3.10-38
Operational Noise Increases	SM	3.10-43	LTS	3.10-43	LTS	3.10-40	LTS	3.10-40	LTS	3.10-40	LTS	3.10-40	LTS	3.10-40	SM	3.10-46
Hazards and Hazardous Materials																
Hazardous Materials in Soil and Groundwater	SM	3.11-23	--	3.11-23	SM	3.11-24	SM	3.11-26	SM	3.11-25	SM	3.11-26	SM	3.11-26	SM	3.11-27
Hazardous Building Materials	SM	3.11-28	SM	3.11-29	--	3.11-28	--	3.11-28	--	3.11-28	--	3.11-28	--	3.11-28	--	3.11-28
Gassy Conditions in Tunnels	--	3.11-30	--	3.11-30	LTS	3.11-30	--	3.11-30	--	3.11-30	--	3.11-30	--	3.11-30	--	3.11-30
High Pressure Gas Line Rupture	--	3.11-30	--	3.11-30	SM	3.11-30	SM	3.11-30	--	3.11-30	SM	3.11-30	SM	3.11-30	SM	3.11-30
Wildland Fires	--	3.11-31	--	3.11-31	LTS	3.11-31	--	3.11-31	--	3.11-31	--	3.11-31	--	3.11-31	LTS	3.11-31
Release from Construction Equipment	LTS	3.11-32	LTS	3.11-32	LTS	3.11-32	LTS	3.11-32	LTS	3.11-32	LTS	3.11-32	LTS	3.11-32	LTS	3.11-32
Accidental Release during Operation	LTS	3.11-36	LTS	3.11-36	--	3.11-33	LTS	3.11-36	--	3.11-33	--	3.11-33	--	3.11-33	--	3.11-33
Public Services and Utilities																
Disruption of Utility Lines	SM	3.12-11	SM	3.12-11	SM	3.12-14	SM	3.12-15	SM	3.12-14	SM	3.12-14	SM	3.12-15	SM	3.12-15
Increase in Electricity Demand	LTS	3.12-17	LTS	3.12-17	LTS	3.12-17	LTS	3.12-17	LTS	3.12-17	LTS	3.12-17	LTS	3.12-17	LTS	3.12-17
Increase in Public Services Demand	LTS	3.12-19	LTS	3.12-19	LTS	3.12-19	LTS	3.12-19	LTS	3.12-19	LTS	3.12-19	LTS	3.12-19	LTS	3.12-19
Adverse Effect On Landfill Capacity	SM	3.12-19	--	3.12-19	SM	3.12-19	SM	3.12-19	SM	3.12-19	SM	3.12-19	SM	3.12-19	--	3.12-19
Failure to Achieve State Diversion Mandates	SM	3.12-21	SM	3.12-21	SM	3.12-21	SM	3.12-21	SM	3.12-21	SM	3.12-21	SM	3.12-21	--	3.12-21

[a] Impacts summarized; please see Chapter 3 for details. Does not include program-level elements. See Table S-10 for mitigation measures.
[b] These projects are in multiple jurisdictions (Lafayette and Orinda).
[c] This project is in multiple jurisdictions (Lafayette and Moraga).

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TABLE S-5
WATER TREATMENT AND TRANSMISSION IMPROVEMENTS PROGRAM – PROJECTS IN ORINDA: SUMMARY OF IMPACTS

Impacts[a]	Orinda WTP				Orinda-Lafayette Aqueduct[b] (Alternative 2 only)		Ardith and Donald Pumping Plant		Happy Valley Pumping Plant and Pipeline		Sunnyside Pumping Plant and Pipeline[b]	
	Alternative 1	Described on page	Alternative 2	Described on page		Described on page		Described on page		Described on page		Described on page
Land Use, Planning, and Recreation												
Divide an Established Community	--	3.2-14	--	3.2-14	LTS	3.2-14	--	3.2-14	LTS	3.2-14	LTS	3.2-14
Agricultural Resources Impacts	--	3.2-16	--	3.2-16	--	3.2-16	--	3.2-16	--	3.2-16	LTS	3.2-16
Recreation Resources Impacts	LTS	3.2-17	LTS	3.2-17	LTS	3.2-17	--	3.2-16	LTS	3.2-17	--	3.2-16
Visual Quality												
Short-Term Visual Effects during Construction	LTS	3.3-23	LTS	3.3-23	LTS	3.3-23	LTS	3.3-23	LTS	3.3-19	LTS	3.3-19
Alteration of Appearance of WTTIP Sites	SM	3.3-25	SM	3.3-26	LTS	3.3-29	SM	3.3-29	SM	3.3-30	SM	3.3-33
Effects on Views	SM	3.3-38	SM	3.3-39	LTS	3.3-41	SM	3.3-41	SM	3.3-42	SM	3.3-45
Effects on Scenic Vista	LTS	3.3-46	LTS	3.3-46	LTS	3.3-46	LTS	3.3-46	LTS	3.3-46	LTS	3.3-46
New Sources of Light and Glare	SM	3.3-47	SM	3.3-47	SM	3.3-47	SM	3.3-47	SM	3.3-47	SM	3.3-47
Geology, Soils, and Seismicity												
Slope Stability	LTS	3.4-22	LTS	3.4-22	SM	3.4-22	SM	3.4-23	SM	3.4-23	SM	3.4-25
Groundshaking	SM	3.4-26	SM	3.4-26	SM	3.4-26	SM	3.4-26	SM	3.4-26	SM	3.4-26
Expansive Soils	SM	3.4-27	SM	3.4-27	SM	3.4-27	SM	3.4-27	SM	3.4-27	SM	3.4-27
Liquefaction	SM	3.4-29	SM	3.4-29	SM	3.4-29	LTS	3.4-30	SM	3.4-30	LTS	3.4-31
Ground Squeezing	--	3.4-32	--	3.4-32	SM	3.4-32	--	3.4-32	--	3.4-32	--	3.4-32
Hydrology and Water Quality												
Degradation of Water Quality during Construction	SM	3.5-27	SM	3.5-28	SM	3.5-28	SM	3.5-29	SM	3.5-29	SM	3.5-31
Groundwater Dewatering	LTS	3.5-32	LTS	3.5-32	LTS	3.5-33	--	3.5-33	LTS	3.5-34	--	3.5-35
Diversion of Flood Flows	--	3.5-35	--	3.5-35	SM	3.5-35	--	3.5-35	SM	3.5-35	--	3.5-35
Discharge of Chloraminated Water during Construction	LTS	3.5-36	LTS	3.5-36	LTS	3.5-36	--	3.5-36	--	3.5-36	--	3.5-36
Operational Discharge of Chloraminated Water	--	3.5-38	LTS	3.5-38	--	3.5-37	LTS	3.5-38	--	3.5-37	--	3.5-37
Change in Impervious Surfaces	LTS	3.5-43	LTS	3.5-43	LTS	3.5-43	SM	3.5-45	LTS	3.5-43	LTS	3.5-44
Biological Resources												
Loss of or Damage to Protected Trees	LTS	3.6-30	SM	3.6-30	SM	3.6-33	LTS	3.6-30	SM	3.6-30	SM	3.6-30
Degradation to Streams, Wetlands, and Riparian Habitats	--	3.6-36	SM	3.6-36	SM	3.6-36	--	3.6-34	SM	3.6-37	--	3.6-34
Loss of or Damage to Special-Status Plants	--	3.6-41	--	3.6-41	--	3.6-41	--	3.6-41	SM	3.6-41	--	3.6-41

[a] Impacts summarized; please see Chapter 3 for details. Does not include program-level elements. See Table S-10 for mitigation measures.
[b] These projects are in multiple jurisdictions (Orinda and Lafayette).

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SM = Significant and Mitigable
SU = Significant and Unavoidable
-- = Impact does not apply

TABLE S-5 (Continued)
WATER TREATMENT AND TRANSMISSION IMPROVEMENTS PROGRAM – PROJECTS IN ORINDA: SUMMARY OF IMPACTS

Impacts[a]	Orinda WTP				Orinda-Lafayette Aqueduct[b] (Alternative 2 only)		Ardith and Donald Pumping Plant		Happy Valley Pumping Plant and Pipeline		Sunnyside Pumping Plant and Pipeline[b]	
	Alternative 1	Described on page	Alternative 2	Described on page		Described on page		Described on page		Described on page		Described on page
Biological Resources (cont.)												
Disturbance to Special-Status Birds	SM	3.6-45	SM	3.6-45	SM	3.6-46	SM	3.6-46	SM	3.6-47	SM	3.6-49
Disturbance to Special-Status Bats	--	3.6-52	SM	3.6-53	SM	3.6-53	--	3.6-51	SM	3.6-54	SM	3.6-55
Disturbance to San Francisco Dusky-Footed Woodrat	--	3.6-57	SM	3.6-57	SM	3.6-57	--	3.6-56	SM	3.6-58	--	3.6-56
Degradation of Special-Status Aquatic Species Habitat	--	3.6-60	SM	3.6-60	SM	3.6-61	--	3.6-59	SM	3.6-61	--	3.6-59
Disruption to Wildlife Corridors	--	3.6-67	LTS	3.6-67	LTS	3.6-68	--	3.6-66	LTS	3.6-68	LTS	3.6-69
Cultural Resources												
Archaeological Resources, including Unrecorded Cultural Resources	SM	3.7-17	SM	3.7-17	SM	3.7-17	SM	3.7-17	SM	3.7-17	SM	3.7-17
Paleontological Resources	SM	3.7-25	SM	3.7-25	SM	3.7-25	SM	3.7-25	SM	3.7-25	SM	3.7-25
Historic Settings	LTS	3.7-26	LTS	3.7-26	--	3.7-26	--	3.7-26	--	3.7-26	--	3.7-26
Traffic and Circulation												
Increased Traffic	SM	3.8-11	SM	3.8-11	SM	3.8-11	SM	3.8-11	SM	3.8-11	SM	3.8-11
Reduced Road Width	--	3.8-15	--	3.8-15	SM	3.8-18	--	3.8-18	SM	3.8-16	--	3.8-15
Parking	SM	3.8-19	SM	3.8-19	SM	3.8-19	SM	3.8-19	SM	3.8-19	LTS	3.8-19
Traffic Safety	SM	3.8-20	SM	3.8-20	SM	3.8-20	SM	3.8-20	SM	3.8-20	SM	3.8-20
Access	--	3.8-20	--	3.8-20	SM	3.8-20	--	3.8-20	SM	3.8-21	--	3.8-20
Transit	--	3.8-21	--	3.8-21	SM	3.8-21	--	3.8-21	SU	3.8-22	--	3.8-21
Pavement Damage/Wear	LTS	3.8-22	LTS	3.8-22	LTS	3.8-22	SM	3.8-22	SM	3.8-22	LTS	3.8-22
Air Quality												
Construction Emission	SM	3.9-16	SM	3.9-16	SM	3.9-18	SM	3.9-18	SM	3.9-20	SM	3.9-22
DPM Emissions Along Haul Routes	LTS	3.9-25	LTS	3.9-25	LTS	3.9-25	LTS	3.9-25	LTS	3.9-25	LTS	3.9-25
Tunnel-Related Emissions	--	3.9-28	--	3.9-28	SM	3.9-28	--	3.9-28	--	3.9-28	--	3.9-28
Operational Pollutant Emissions at Treatment Facilities	LTS	3.9-30	LTS	3.9-30	--	3.9-30	--	3.9-30	--	3.9-30	--	3.9-30
Operational Odor Emissions	LTS	3.9-32	LTS	3.9-32	LTS	3.9-32	LTS	3.9-32	LTS	3.9-32	LTS	3.9-32
Secondary Emissions from Electricity Generation	LTS	3.9-33	LTS	3.9-33	LTS	3.9-33	LTS	3.9-33	LTS	3.9-33	LTS	3.9-33

[a] Impacts summarized; please see Chapter 3 for details. Does not include program-level elements. See Table S-10 for mitigation measures.
[b] These projects are in multiple jurisdictions (Orinda and Lafayette).

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TABLE S-5 (Continued)
WATER TREATMENT AND TRANSMISSION IMPROVEMENTS PROGRAM – PROJECTS IN ORINDA: SUMMARY OF IMPACTS

Impacts[a]	Orinda WTP				Orinda-Lafayette Aqueduct[b] (Alternative 2 only)		Ardith and Donald Pumping Plant		Happy Valley Pumping Plant and Pipeline		Sunnyside Pumping Plant and Pipeline[b]	
	Alternative 1	Described on page	Alternative 2	Described on page		Described on page		Described on page		Described on page		Described on page
Noise and Vibration												
Construction Noise Increases	SM	3.10-18	SM	3.10-18	SM	3.10-20	SM	3.10-23	SM	3.10-25	SM	3.10-29
Noise Increases Along Haul Routes	LTS	3.10-36	LTS	3.10-36	LTS	3.10-37	LTS	3.10-37	LTS	3.10-37	LTS	3.10-37
Construction-Related Vibration Effects	SM	3.10-38	SM	3.10-38	SM	3.10-39	LTS	3.10-38	LTS	3.10-38	LTS	3.10-38
Operational Noise Increases	LTS	3.10-44	SM	3.10-44	LTS	3.10-44	SM	3.10-45	SM	3.10-46	SM	3.10-46
Hazards and Hazardous Materials												
Hazardous Materials in Soil and Groundwater	SM	3.11-23	SM	3.11-24	SM	3.11-24	SM	3.11-25	SM	3.11-25	SM	3.11-27
Hazardous Building Materials	--	3.11-28	SM	3.11-28	--	3.11-28	LTS	3.11-29	--	3.11-28	--	3.11-28
Gassy Conditions in Tunnels	--	3.11-30	--	3.11-30	LTS	3.11-30	--	3.11-30	--	3.11-30	--	3.11-30
High Pressure Gas Line Rupture	--	3.11-30	--	3.11-30	SM	3.11-30	--	3.11-30	SM	3.11-30	SM	3.11-30
Wildland Fires	LTS	3.11-31	LTS	3.11-31	LTS	3.11-31	--	3.11-31	LTS	3.11-31	LTS	3.11-31
Release from Construction Equipment	LTS	3.11-32	LTS	3.11-32	LTS	3.11-32	LTS	3.11-32	LTS	3.11-32	LTS	3.11-32
Accidental Release during Operation	--	3.11-33	--	3.11-33	--	3.11-33	--	3.11-33	--	3.11-33	--	3.11-33
Public Services and Utilities												
Disruption of Utility Lines	SM	3.12-11	SM	3.12-11	SM	3.12-11	SM	3.12-11	SM	3.12-14	SM	3.12-15
Increase in Electricity Demand	LTS	3.12-17	LTS	3.12-17	LTS	3.12-17	LTS	3.12-17	LTS	3.12-17	LTS	3.12-17
Increase in Public Services Demand	LTS	3.12-19	LTS	3.12-19	LTS	3.12-19	LTS	3.12-19	LTS	3.12-19	LTS	3.12-19
Adverse Effect On Landfill Capacity	SM	3.12-19	SM	3.12-19	SM	3.12-19	SM	3.12-19	SM	3.12-19	--	3.12-19
Failure to Achieve State Diversion Mandates	SM	3.12-21	SM	3.12-21	SM	3.12-21	SM	3.12-21	SM	3.12-21	--	3.12-21

[a] Impacts summarized; please see Chapter 3 for details. Does not include program-level elements. See Table S-10 for mitigation measures.
[b] These projects are in multiple jurisdictions (Orinda and Lafayette).

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TABLE S-6
WATER TREATMENT AND TRANSMISSION IMPROVEMENTS PROGRAM – PROJECTS IN TOWN OF MORAGA: SUMMARY OF IMPACTS

Impacts[a]	Fay Hill Pumping Plant and Pipeline	Described on page	Fay Hill Reservoir	Described on page	Moraga Road Pipeline[b]	Described on page	Moraga Reservoir	Described on page
Land Use, Planning, and Recreation								
Divide an Established Community	LTS	3.2-14	--	3.2-14	LTS	3.2-14	--	3.2-14
Agricultural Resources Impacts	LTS	3.2-16	LTS	3.2-16	LTS	3.2-16	--	3.2-16
Recreation Resources Impacts	--	3.2-16	--	3.2-16	LTS	3.2-18	--	3.2-16
Visual Quality								
Short-Term Visual Effects during Construction	LTS	3.3-23	LTS	3.3-23	LTS	3.3-19	LTS	3.3-23
Alteration of Appearance of WTTIP Sites	LTS	3.3-30	LTS	3.3-30	SM	3.3-33	LTS	3.3-32
Effects on Views	LTS	3.3-41	LTS	3.3-41	SM	3.3-44	LTS	3.3-44
Effects on Scenic Vista	LTS	3.3-46	LTS	3.3-46	LTS	3.3-46	LTS	3.3-46
New Sources of Light and Glare	SM	3.3-47	SM	3.3-47	LTS	3.3-47	LTS	3.3-47
Geology, Soils, and Seismicity								
Slope Stability	LTS	3.4-16	SM	3.4-22	SM	3.4-16	SM	3.4-24
Groundshaking	SM	3.4-26	SM	3.4-26	SM	3.4-26	SM	3.4-26
Expansive Soils	SM	3.4-27	SM	3.4-27	SM	3.4-27	SM	3.4-27
Liquefaction	LTS	3.4-30	LTS	3.4-30	SM	3.4-31	LTS	3.4-31
Ground Squeezing	--	3.4-32	--	3.4-32	--	3.4-32	--	3.4-32
Hydrology and Water Quality								
Degradation of Water Quality during Construction	SM	3.5-29	SM	3.5-29	SM	3.5-30	SM	3.5-30
Groundwater Dewatering	--	3.5-33	--	3.5-34	LTS	3.5-35	--	3.5-35
Diversion of Flood Flows	--	3.5-35	--	3.5-35	SM	3.5-35	--	3.5-35
Discharge of Chloraminated Water during Construction	--	3.5-36	LTS	3.5-36	--	3.5-36	LTS	3.5-36
Operational Discharge of Chloraminated Water	--	3.5-37	--	3.5-37	--	3.5-37	--	3.5-37
Change in Impervious Surfaces	LTS	3.5-45	SM	3.5-45	LTS	3.5-44	SM	3.5-45
Biological Resources								
Loss of or Damage to Protected Trees	LTS	3.6-30	SM	3.6-30	SM	3.6-30	SM	3.6-30
Degradation to Streams, Wetlands, and Riparian Habitats	--	3.6-34	--	3.6-34	SM	3.6-39	--	3.6-34
Loss of or Damage to Special-Status Plants	--	3.6-41	--	3.6-41	SM	3.6-41	--	3.6-41
Disturbance to Special-Status Birds	SM	3.6-46	SM	3.6-46	SM	3.6-48	SM	3.6-48
Disturbance to Special-Status Bats	--	3.6-51	SM	3.6-53	SM	3.6-55	--	3.6-51
Disturbance to San Francisco Dusky-Footed Woodrat	--	3.6-56	--	3.6-56	SM	3.6-58	--	3.6-56
Degradation of Special-Status Aquatic Species Habitat	--	3.6-59	--	3.6-59	SM	3.6-62	--	3.6-59
Disruption to Wildlife Corridors	--	3.6-66	LTS	3.6-68	LTS	3.6-66	--	3.6-66

[a] Impacts summarized; please see Chapter 3 for details. Does not include program-level elements. See Table S-10 for mitigation measures.
[b] These projects are in multiple jurisdictions (Moraga and Lafayette).

LTS = Less Than Significant
SM = Significant and Mitigable
SU = Significant and Unavoidable
-- = Impact does not apply

TABLE S-6 (Continued)
WATER TREATMENT AND TRANSMISSION IMPROVEMENTS PROGRAM – PROJECTS IN TOWN OR MORAGA: SUMMARY OF IMPACTS

Impacts[a]	Fay Hill Pumping Plant and Pipeline	Described on page	Fay Hill Reservoir	Described on page	Moraga Road Pipeline[b]	Described on page	Moraga Reservoir	Described on page
Cultural Resources								
Archaeological Resources, including Unrecorded Cultural Resources	SM	3.7-17	SM	3.7-17	SM	3.7-17	SM	3.7-17
Paleontological Resources	SM	3.7-25	SM	3.7-25	SM	3.7-25	SM	3.7-25
Historic Settings	--	3.7-26	--	3.7-26	LTS	3.7-26	--	3.7-26
Traffic and Circulation								
Increased Traffic	SM	3.8-11	SM	3.8-11	SM	3.8-11	SM	3.8-11
Reduced Road Width	SM	3.8-18	--	3.8-18	SM	3.8-16	--	3.8-18
Parking	SM	3.8-19	LTS	3.8-19	SM	3.8-19	SM	3.8-19
Traffic Safety	SM	3.8-20	SM	3.8-20	SM	3.8-20	SM	3.8-20
Access	SM	3.8-20	--	3.8-20	SM	3.8-20	--	3.8-20
Transit	LTS	3.8-21	--	3.8-21	SM	3.8-22	--	3.8-21
Pavement Damage/Wear	LTS	3.8-22	LTS	3.8-22	LTS	3.8-22	SM	3.8-22
Air Quality								
Construction Emission	SM	3.9-19	SM	3.9-19	SM	3.9-22	SM	3.9-22
DPM Emissions Along Haul Routes	LTS	3.9-25	LTS	3.9-25	LTS	3.9-25	LTS	3.9-25
Tunnel-Related Emissions	--	3.9-28	--	3.9-28	--	3.9-28	--	3.9-28
Operational Pollutant Emissions at Treatment Facilities	--	3.9-29	--	3.9-29	--	3.9-29	--	3.9-29
Operational Odor Emissions	LTS	3.9-32	LTS	3.9-32	LTS	3.9-32	LTS	3.9-32
Secondary Emissions from Electricity Generation	LTS	3.9-33	LTS	3.9-33	LTS	3.9-33	LTS	3.9-33
Noise and Vibration								
Construction Noise Increases	SM	3.10-24	SM	3.10-24	SM	3.10-28	SM	3.10-28
Noise Increases Along Haul Routes	LTS	3.10-37	LTS	3.10-37	LTS	3.10-37	LTS	3.10-37
Construction-Related Vibration Effects	LTS	3.10-38	LTS	3.10-38	SM	3.10-38	SM	3.10-38
Operational Noise Increases	SM	3.10-46	LTS	3.10-40	LTS	3.10-40	LTS	3.10-40
Hazards and Hazardous Materials								
Hazardous Materials in Soil and Groundwater	SM	3.11-25	SM	3.11-25	SM	3.11-26	SM	3.11-26
Hazardous Building Materials	SM	3.11-29	SM	3.11-29	--	3.11-28	SM	3.11-29
Gassy Conditions in Tunnels	--	3.11-30	--	3.11-30	--	3.11-30	--	3.11-30
High Pressure Gas Line Rupture	--	3.11-30	--	3.11-30	SM	3.11-30	--	3.11-30
Wildland Fires	--	3.11-31	--	3.11-31	--	3.11-31	--	3.11-31
Release from Construction Equipment	LTS	3.11-32	LTS	3.11-32	LTS	3.11-32	LTS	3.11-32
Accidental Release during Operation	--	3.11-33	--	3.11-33	--	3.11-33	--	3.11-33
Public Services and Utilities								
Disruption of Utility Lines	SM	3.12-14	SM	3.12-11	SM	3.12-15	SM	3.12-11
Increase in Electricity Demand	LTS	3.12-17	LTS	3.12-17	LTS	3.12-17	LTS	3.12-17
Increase in Public Services Demand	LTS	3.12-19	LTS	3.12-19	LTS	3.12-19	LTS	3.12-19
Adverse Effect On Landfill Capacity	SM	3.12-19	SM	3.12-19	SM	3.12-19	SM	3.12-19
Failure to Achieve State Diversion Mandates	SM	3.12-21	SM	3.12-21	SM	3.12-21	SM	3.12-21

[a] Impacts summarized; please see Chapter 3 for details. See Table S-10 for mitigation measures.

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-- = Impact does not apply

TABLE S-7
WATER TREATMENT AND TRANSMISSION IMPROVEMENTS PROGRAM – PROJECTS IN WALNUT CREEK: SUMMARY OF IMPACTS

Impacts[a]	Walnut Creek WTP: Alternative 1 or 2	Walnut Creek WTP: Described on page	Leland Isolation Pipeline and Bypass Valves	Described on page
Land Use, Planning, and Recreation				
Divide an Established Community	--	3.2-14	LTS	3.2-14
Agricultural Resources Impacts	--	3.2-16	--	3.2-16
Recreation Resources Impacts	LTS	3.2-17	LTS	3.2-18
Visual Quality				
Short-Term Visual Effects during Construction	LTS	3.3-23	LTS	3.3-19
Alteration of Appearance of WTTIP Sites	SM	3.3-27	SM	3.3-32
Effects on Views	SM	3.3-39	SM	3.3-44
Effects on Scenic Vista	LTS	3.3-46	LTS	3.3-46
New Sources of Light and Glare	SM	3.3-47	LTS	3.3-47
Geology, Soils, and Seismicity				
Slope Stability	SM	3.4-16	LTS	3.4-24
Groundshaking	SM	3.4-26	SM	3.4-26
Expansive Soils	SM	3.4-27	SM	3.4-27
Liquefaction	LTS	3.4-29	SM	3.4-31
Ground Squeezing	--	3.4-32	--	3.4-32
Hydrology and Water Quality				
Degradation of Water Quality during Construction	SM	3.5-28	SM	3.5-30
Groundwater Dewatering	LTS	3.5-33	--	3.5-34
Diversion of Flood Flows	--	3.5-35	SM	3.5-35
Discharge of Chloraminated Water during Construction	LTS	3.5-36	--	3.5-36
Operational Discharge of Chloraminated Water	--	3.5-37	--	3.5-37
Change in Impervious Surfaces	LTS	3.5-45	LTS	3.5-45
Biological Resources				
Loss of or Damage to Protected Trees	--	3.6-30	SM	3.6-30
Degradation to Streams, Wetlands, and Riparian Habitats	SM	3.6-34	SM	3.6-34
Loss of or Damage to Special-Status Plants	--	3.6-41	--	3.6-41
Disturbance to Special-Status Birds	SM	3.6-46	SM	3.6-46
Disturbance to Special-Status Bats	SM	3.6-51	SM	3.6-51
Disturbance to San Francisco Dusky-Footed Woodrat	--	3.6-56	--	3.6-56
Degradation of Special-Status Aquatic Species Habitat	--	3.6-59	--	3.6-59
Disruption to Wildlife Corridors	--	3.6-66	--	3.6-66
Cultural Resources				
Archaeological Resources, including Unrecorded Cultural Resources	SM	3.7-17	SM	3.7-17
Paleontological Resources	SM	3.7-25	SM	3.7-25
Historic Settings	--	3.7-26	--	3.7-26
Traffic and Circulation				
Increased Traffic	SM	3.8-11	SM	3.8-11
Reduced Road Width	--	3.8-15	SM	3.8-17
Parking	LTS	3.8-19	SM	3.8-19

[a] Impacts summarized; please see Chapter 3 for details. Does not include program-level elements. See Table S-10 for mitigation measures.

LTS = Less Than Significant
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-- = Impact does not apply

TABLE S-7 (Continued)
WATER TREATMENT AND TRANSMISSION IMPROVEMENTS PROGRAM – PROJECTS IN WALNUT CREEK: SUMMARY OF IMPACTS

Impacts[a]	Walnut Creek WTP Alternative 1 or 2	Walnut Creek WTP Described on page	Leland Isolation Pipeline and Bypass Valves	Leland Isolation Pipeline and Bypass Valves Described on page
Traffic and Circulation (cont.)				
Traffic Safety	SM	3.8-20	SM	3.8-20
Access	--	3.8-20	LTS	3.8-20
Transit	--	3.8-21	LTS	3.8-21
Pavement Damage/Wear	SM	3.8-22	LTS	3.8-22
Air Quality				
Construction Emission	SM	3.9-17	SM	3.9-21
DPM Emissions Along Haul Routes	LTS	3.9-25	LTS	3.9-25
Tunnel-Related Emissions	--	3.9-28	--	3.9-28
Operational Pollutant Emissions at Treatment Facilities	LTS	3.9-31	--	3.9-29
Operational Odor Emissions	LTS	3.9-32	LTS	3.9-32
Secondary Emissions from Electricity Generation	LTS	3.9-33	LTS	3.9-33
Noise and Vibration				
Construction Noise Increases	SM	3.10-19	SM	3.10-27
Noise Increases Along Haul Routes	LTS	3.10-36	LTS	3.10-37
Construction-Related Vibration Effects	SM	3.10-38	LTS	3.10-38
Operational Noise Increases	SM	3.10-45	LTS	3.10-40
Hazards and Hazardous Materials				
Hazardous Materials in Soil and Groundwater	SM	3.11-24	SM	3.11-26
Hazardous Building Materials	--	3.11-28	--	3.11-28
Gassy Conditions in Tunnels	--	3.11-30	--	3.11-30
High Pressure Gas Line Rupture	--	3.11-30	SM	3.11-31
Wildland Fires	--	3.11-31	--	3.11-31
Release from Construction Equipment	LTS	3.11-32	LTS	3.11-32
Accidental Release during Operation	--	3.11-33	--	3.11-33
Public Services and Utilities				
Disruption of Utility Lines	SM	3.12-11	SM	3.12-15
Increase in Electricity Demand	LTS	3.12-17	LTS	3.12-17
Increase in Public Services Demand	LTS	3.12-19	LTS	3.12-19
Adverse Effect On Landfill Capacity	SM	3.12-19	LTS	3.12-19
Failure to Achieve State Diversion Mandates	SM	3.12-21	SM	3.12-21

[a] Impacts summarized; please see Chapter 3 for details. See Table S-10 for mitigation measures.

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TABLE S-8
WATER TREATMENT AND TRANSMISSION IMPROVEMENTS PROGRAM – PROJECTS IN OAKLAND: SUMMARY OF IMPACTS

Impacts[a]	Upper San Leandro WTP	Described on page
Land Use, Planning, and Recreation		
Divide an Established Community	--	3.2-14
Agricultural Resources Impacts	--	3.2-16
Recreation Resources Impacts	--	3.2-16
Visual Quality		
Short-Term Visual Effects during Construction	LTS	3.3-23
Alteration of Appearance of WTTIP Sites	LTS	3.3-28
Effects on Views	LTS	3.3-41
Effects on Scenic Vista	LTS	3.3-46
New Sources of Light and Glare	SM	3.3-47
Geology, Soils, and Seismicity		
Slope Stability	LTS	3.4-22
Groundshaking	SM	3.4-26
Expansive Soils	SM	3.4-27
Liquefaction	LTS	3.4-29
Ground Squeezing	--	3.4-32
Hydrology and Water Quality		
Degradation of Water Quality during Construction	SM	3.5-28
Groundwater Dewatering	--	3.5-33
Diversion of Flood Flows	--	3.5-35
Discharge of Chloraminated Water during Construction	LTS	3.5-36
Operational Discharge of Chloraminated Water	--	3.5-37
Change in Impervious Surfaces	LTS	3.5-46
Biological Resources		
Loss of or Damage to Protected Trees	SM	3.6-30
Degradation to Streams, Wetlands, and Riparian Habitats	--	3.6-34
Loss of or Damage to Special-Status Plants	--	3.6-41
Disturbance to Special-Status Birds	SM	3.6-45
Disturbance to Special-Status Bats	--	3.6-51
Disturbance to San Francisco Dusky-Footed Woodrat	--	3.6-56
Degradation of Special-Status Aquatic Species Habitat	--	3.6-59
Disruption to Wildlife Corridors	--	3.6-66
Cultural Resources		
Archaeological Resources, including Unrecorded Cultural Resources	SM	3.7-17
Paleontological Resources	SM	3.7-25
Historic Settings	--	3.7-26
Traffic and Circulation		
Increased Traffic	SM	3.8-11
Reduced Road Width	--	3.8-15
Parking	LTS	3.8-19

[a] Impacts summarized; please see Chapter 3 for details. See Table S-10 for mitigation measures.

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TABLE S-8 (Continued)
WATER TREATMENT AND TRANSMISSION IMPROVEMENTS PROGRAM – PROJECTS IN OAKLAND: SUMMARY OF IMPACTS

Impacts[a]	Upper San Leandro WTP	Described on page
Traffic and Circulation		
Traffic Safety	SM	3.8-20
Access	--	3.8-20
Transit	--	3.8-21
Pavement Damage/Wear	SM	3.8-22
Air Quality		
Construction Emission	SM	3.9-17
DPM Emissions Along Haul Routes	LTS	3.9-25
Tunnel-Related Emissions	--	3.9-28
Operational Pollutant Emissions at Treatment Facilities	LTS	3.9-32
Operational Odor Emissions	LTS	3.9-32
Secondary Emissions from Electricity Generation	LTS	3.9-33
Noise and Vibration		
Construction Noise Increases	SM	3.10-19
Noise Increases Along Haul Routes	LTS	3.10-37
Construction-Related Vibration Effects	SM	3.10-38
Operational Noise Increases	LTS	3.10-45
Hazards and Hazardous Materials		
Hazardous Materials in Soil and Groundwater	SM	3.11-24
Hazardous Building Materials	SM	3.11-29
Gassy Conditions in Tunnels	--	3.11-30
High Pressure Gas Line Rupture	--	3.11-30
Wildland Fires	--	3.11-31
Release from Construction Equipment	LTS	3.11-32
Accidental Release during Operation	LTS	3.11-37
Public Services and Utilities		
Disruption of Utility Lines	SM	3.12-11
Increase in Electricity Demand	LTS	3.12-17
Increase in Public Services Demand	LTS	3.12-19
Adverse Effect On Landfill Capacity	SM	3.12-19
Failure to Achieve State Diversion Mandates	SM	3.12-21

[a] Impacts summarized; please see Chapter 3 for details. See Table S-10 for mitigation measures.

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TABLE S-9
WATER TREATMENT AND TRANSMISSION IMPROVEMENTS PROGRAM –
PROJECTS IN UNINCORPORATED CONTRA COSTA COUNTY: SUMMARY OF IMPACTS

Impacts[a]	Sobrante WTP	Described on page	Tice Pumping Plant and Pipeline	Described on page	Withers Pumping Plant	Described on page
Land Use, Planning, and Recreation						
Divide an Established Community	--	3.2-14	LTS	3.2-14	--	3.2-14
Agricultural Resources Impacts	--	3.2-16	--	3.2-16	LTS	3.2-16
Recreation Resources Impacts	--	3.2-16	LTS	3.2-18	LTS	3.2-19
Visual Quality						
Short-Term Visual Effects during Construction	LTS	3.3-23	LTS	3.3-19	LTS	3.3-23
Alteration of Appearance of WTTIP Sites	SM	3.3-27	SM	3.3-34	SM	3.3-34
Effects on Views	SM	3.3-40	SM	3.3-45	SM	3.3-46
Effects on Scenic Vista	LTS	3.3-46	LTS	3.3-46	LTS	3.3-46
New Sources of Light and Glare	SM	3.3-47	SM	3.3-47	SM	3.3-47
Geology, Soils, and Seismicity						
Slope Stability	SM	3.4-22	SM	3.4-25	SM	3.4-25
Groundshaking	SM	3.4-26	SM	3.4-26	SM	3.4-26
Expansive Soils	SM	3.4-27	SM	3.4-27	SM	3.4-27
Liquefaction	LTS	3.4-29	SM	3.4-31	LTS	3.4-32
Ground Squeezing	--	3.4-32	--	3.4-32	--	3.4-32
Hydrology and Water Quality						
Degradation of Water Quality during Construction	SM	3.5-28	SM	3.5-31	SM	3.5-31
Groundwater Dewatering	LTS	3.5-33	LTS	3.5-35	--	3.5-35
Diversion of Flood Flows	--	3.5-35	SM	3.5-35	--	3.5-35
Discharge of Chloraminated Water during Construction	LTS	3.5-36	--	3.5-36	--	3.5-36
Operational Discharge of Chloraminated Water	--	3.5-37	--	3.5-37	--	3.5-37
Change in Impervious Surfaces	LTS	3.5-43	LTS	3.5-44	LTS	3.5-45
Biological Resources						
Loss of or Damage to Protected Trees	SM	3.6-30	SM	3.6-30	SM	3.6-30
Degradation to Streams, Wetlands, and Riparian Habitats	SM	3.6-36	SM	3.6-39	LTS	3.6-34
Loss of or Damage to Special-Status Plants	--	3.6-41	SM	3.6-41	--	3.6-41
Disturbance to Special-Status Birds	SM	3.6-45	SM	3.6-49	SM	3.6-49
Disturbance to Special-Status Bats	SM	3.6-53	SM	3.6-55	--	3.6-51
Disturbance to San Francisco Dusky-Footed Woodrat	LTS	3.6-57	LTS	3.6-58	--	3.6-56
Degradation of Special-Status Aquatic Species Habitat	SM	3.6-61	SM	3.6-63	--	3.6-59
Disruption to Wildlife Corridors	LTS	3.6-68	LTS	3.6-66	--	3.6-66
Cultural Resources						
Archaeological Resources, including Unrecorded Cultural Resources	SM	3.7-17	SM	3.7-17	SM	3.7-17
Paleontological Resources	SM	3.7-25	SM	3.7-25	SM	3.7-25
Historic Settings	--	3.7-26	--	3.7-26	--	3.7-26
Traffic and Circulation						
Increased Traffic	SM	3.8-11	SM	3.8-11	SM	3.8-11
Reduced Road Width	--	3.8-15	SM	3.8-16	--	3.8-15
Parking	SM	3.8-19	SM	3.8-19	LTS	3.8-19

[a] Impacts summarized; please see Chapter 3 for details. See Table S-10 for mitigation measures.

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TABLE S-9 (Continued)
WATER TREATMENT AND TRANSMISSION IMPROVEMENTS PROGRAM –
PROJECTS IN UNINCORPORATED CONTRA COSTA COUNTY: SUMMARY OF IMPACTS

Impacts[a]	Sobrante WTP	Described on page	Tice Pumping Plant and Pipeline	Described on page	Withers Pumping Plant	Described on page
Traffic and Circulation (cont.)						
Traffic Safety	SM	3.8-20	SM	3.8-20	SM	3.8-20
Access	--	3.8-20	SM	3.8-21	--	3.8-20
Transit	--	3.8-21	SU	3.8-22	--	3.8-21
Pavement Damage/Wear	LTS	3.8-22	SM	3.8-22	LTS	3.8-22
Air Quality						
Construction Emission	SM	3.9-17	SM	3.9-23	SM	3.9-22
DPM Emissions Along Haul Routes	LTS	3.9-25	LTS	3.9-25	LTS	3.9-25
Tunnel-Related Emissions	--	3.9-28	--	3.9-28	--	3.9-28
Operational Pollutant Emissions at Treatment Facilities	LTS	3.9-31	--	3.9-29	--	3.9-29
Operational Odor Emissions	LTS	3.9-32	LTS	3.9-32	LTS	3.9-32
Secondary Emissions from Electricity Generation	LTS	3.9-33	LTS	3.9-33	LTS	3.9-33
Noise and Vibration						
Construction Noise Increases	SM	3.10-19	SM	3.10-29	SM	3.10-30
Noise Increases Along Haul Routes	LTS	3.10-36	LTS	3.10-37	LTS	3.10-37
Construction-Related Vibration Effects	SM	3.10-38	SM	3.10-38	LTS	3.10-38
Operational Noise Increases	LTS	3.10-45	SM	3.10-47	SM	3.10-48
Hazards and Hazardous Materials						
Hazardous Materials in Soil and Groundwater	SM	3.11-24	SM	3.11-27	SM	3.11-27
Hazardous Building Materials	SM	3.11-29	--	3.11-28	--	3.11-28
Gassy Conditions in Tunnels	--	3.11-30	--	3.11-30	--	3.11-30
High Pressure Gas Line Rupture	--	3.11-30	SM	3.11-30	--	3.11-30
Wildland Fires	--	3.11-31	--	3.11-31	LTS	3.11-31
Release from Construction Equipment	LTS	3.11-32	LTS	3.11-32	LTS	3.11-32
Accidental Release during Operation	LTS	3.11-37	--	3.11-33	--	3.11-33
Public Services and Utilities						
Disruption of Utility Lines	SM	3.12-11	SM	3.12-15	SM	3.12-16
Increase in Electricity Demand	LTS	3.12-17	LTS	3.12-17	LTS	3.12-17
Increase in Public Services Demand	LTS	3.12-19	LTS	3.12-19	LTS	3.12-19
Adverse Effect On Landfill Capacity	SM	3.12-19	SM	3.12-19	SM	3.12-19
Failure to Achieve State Diversion Mandates	SM	3.12-21	SM	3.12-21	SM	3.12-21

[a] Impacts summarized; please see Chapter 3 for details. See Table S-10 for mitigation measures.

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TABLE S-10
SUMMARY OF MITIGATION MEASURES BY IMPACT

Impact	Mitigation Measure(s)
3.3-1: Short-term visual effects (construction)	▪ For stationary (non-pipeline) projects expected to be constructed over a period of one year or more, the District will require the contractor to ensure that construction-related activity is as clean and inconspicuous as practical by storing building materials and equipment within the proposed construction staging areas or in areas that are generally away from public view and by removing construction debris promptly at regular intervals.
3.3-2a: Altered Visual Appearance (construction)	▪ Implement landscaping plans, in consultation with applicable jurisdiction. ▪ Plant native vegetation and/or construct earth berms around all proposed above-ground facilities to provide screening. ▪ Revegetate disturbed areas to minimize textural contrasts with the surrounding vegetation. ▪ Replace any landscaping at the WTTIP project sites that is removed or destroyed during construction, consistent with the landscape plan, using grasses, shrubs, and trees typical of the surrounding area. ▪ Warrant landscape plantings for one year after project completion.
3.3-2b: Altered Visual Appearance (permanent)	▪ Restore disturbed, graded areas to a natural-appearing landform.
3.3-2c: Changed Views from Surrounding Areas	▪ Paint or include appropriate concrete admixtures in proposed facilities to achieve low-glare, earth-tone colors that blend with the surrounding terrain and visual setting. – At the Lafayette WTP, landscaped berms may be incorporated into the final site and landscape plans at proposed clearwell sites in order to screen views from the Walter Costa Trail. – At the Orinda WTP backwash water facility use textures, colors and materials that will blend with existing filter plant buildings. – For the Tice, Withers, Happy Valley, and Sunnyside Pumping Plants, new pump structures and buildings will include architectural treatment and design elements (such as pitched roofs, roof overhangs, or ornamental window or trim detail) to enhance the appearance of new facilities. – For the Lafayette WTP, Orinda WTP, Happy Valley and Tice Pumping Plants, the design of new walls, gates, and fencing will include aesthetic architectural treatment where facilities are located near public trails, residences, or scenic roadways.
3.3-5: Light Glare during Nighttime Construction	▪ Ensure that lighting used during nighttime construction is directed downward and oriented such that no light source is directly visible from neighboring residential areas to the extent possible.
3.3-5: Light Glare from Permanent Lighting	▪ Utilize cutoff shields and nonglare fixture design. ▪ Ensure that all permanent exterior lighting is directed onsite and downward to the extent possible. ▪ Use motion-sensor activation, landscaping, and avoid highly reflective building materials and/or finishes.
3.4-1: Slope Stability Hazards	▪ Perform site-specific design-level geotechnical evaluations for non-pipeline projects, including detailed slope stability evaluations, to identify specific hazards and mitigate those hazards in final design and during construction. Slope stabilization measures may include: appropriate slope inclination (not steeper than 2 horizontal to 1 vertical), slope terracing, fill compaction, soil reinforcement, surface and subsurface drainage facilities, engineered retaining walls, buttresses, and/or erosion control measures.
3.4-2: Groundshaking Hazards	▪ Perform site-specific design-level evaluations of seismic susceptibility for non-pipeline projects, including subsurface exploration as appropriate and incorporate seismic design criteria to ensure that facilities are designed to withstand the highest expected peak acceleration. Design and construct buildings in accordance with the District's seismic design standards and/or meet or exceed design standards for Seismic Zone 4 in the most recent edition of the California Building Code.
3.4-3: Expansive Soils Hazards	▪ Perform site-specific investigations for non-pipeline projects to determine the presence and characteristics of potentially compressible soils, the engineering properties of the foundation material, the depth and thickness of soil layers, and the depth to groundwater.

TABLE S-10 (Continued)
SUMMARY OF MITIGATION MEASURES BY IMPACT

Impact	Mitigation Measure(s)
3.4-3: Expansive Soils Hazards (cont.)	▪ Include measures to reduce settlement or uplift, including: removal and replacement of soil, deep foundations, and/or deep mixing of compressible or expansive soils with stabilizing agents. ▪ Any fill used will be selected, placed, compacted, and inspected in accordance with plans and specifications prepared by a licensed professional engineer.
3.4-4: Liquefaction Hazards	▪ Perform site-specific evaluation and testing for non-pipeline projects to determine potential for liquefaction and damage to project facilities. ▪ Minimize significant liquefaction hazards through: densification or dewatering of surface or subsurface soils, construction of pile or pier foundations to support pipelines and/or buildings, and/or removal and replacement of liquefiable material with more appropriate material.
3.4-5: Squeezing Ground in Tunnel	▪ Excavate tunnel using either steel rib-type supports and blocking or a precast concrete segmental lining system. ▪ Use shotcrete to strengthen sidewalls and faces when the tunnel excavation is not advanced within about a day.
3.5-1: Degradation to Creek Water Quality	▪ Grade construction staging areas to contain surface runoff so that contaminants such as oil, grease, and fuel products do not drain towards creeks and other receiving waters. ▪ If heavy-duty construction equipment is stored overnight at the construction staging areas, place drip pans beneath the machinery engine block and hydraulic systems to prevent any leakage from entering site runoff or reaching receiving waters. ▪ Obtain an encroachment permit from the Contra Costa County Flood Control and Water Conservation District and comply with state and federal agency requirements pertaining to work in or near wetlands or streambeds.
3.5-3: Flood Flow Impedance	▪ Prohibit the stockpiling of soil, storage of hazardous materials, and stockpiling of construction materials in flood zones during the rainy season.
3.5-6: Impervious Surface Increase	▪ Incorporate site design and landscape features to maximize infiltration, promote retention or detention, slow runoff, and minimize impervious surfaces so that post-development pollutant loads from the site are reduced to the maximum extent possible.
3.6-1: Loss of or Damage to Protected Trees	▪ Prior to construction, trees to be retained that are adjacent to or within project construction areas will be identified, mapped, and clearly delineated by protective fencing (e.g., short post and plank walls), installed at the tree dripline. Where dripline encroachment must occur, use special construction techniques (e.g., hand trenching) to allow the roots to breathe and obtain water. No storage of equipment, machinery, stockpiles of excavated soils, or construction materials; or dumping of oils or chemicals within retained tree driplines. ▪ No more than 25 percent of a tree's canopy removed during the pruning of retained trees. ▪ Removal of protected trees native to the local area, such as valley oak and coast live oak, replaced by native trees on a 3:1 basis. Non-native protected trees replaced at a 1:1 ratio with a native tree species. ▪ Warrant the health of all trees to be preserved within and adjacent to the construction corridor of project-related pipeline and facility sites for three years (five years if dripline area was disturbed). ▪ Replace any tree that is to be retained, but that dies as a result of project construction activities during the warranty period, with a tree of the same species. ▪ Develop and implement a five-year tree monitoring program with appropriate performance standards. ▪ Refine pipeline alignments in the field, to the extent feasible and within hydraulic constraints, to avoid removal of protected trees.
3.6-2: Degradation to Streams, Wetlands, and Riparian Habitats	▪ Confine construction activities to areas above or below the stream crossing, or by using jack-and-bore or similar construction where feasible and where no other sensitive habitat (e.g., stream, riparian habitat, or protected trees) would be affected. ▪ Establish a minimum 25-foot construction exclusion zone (from the edge of wetland, riparian habitat, or the creek banks, whichever is greater), using protective fencing.

TABLE S-10 (Continued)
SUMMARY OF MITIGATION MEASURES BY IMPACT

Impact	Mitigation Measure(s)
3.6-2: Degradation to Streams, Wetlands, and Riparian Habitats (cont.)	▪ If impacts to potentially jurisdictional features and associated riparian vegetation cannot be avoided or minimized, a qualified biologist will complete a wetland delineation in accordance with Corps guidelines and will obtain the appropriate permits/agreements, including a Section 401 water quality certification from the RWQCB, a Section 404 wetland permit from the Corps, and/or a Section 1602 Streambed Alteration Agreement from the CDFG. ▪ Recontour and revegetate any temporarily or permanently disturbed portions of a creek, wetland, or riparian habitat at a ratio depending on type of disturbance and location of restoration opportunity. ▪ Develop and implement a five-year wetland mitigation and monitoring program with appropriate performance standards. ▪ Protect the unvegetated creek banks by replanting banks using native or sterile non-native seeds or seedlings following construction within the creek, removing non-native vegetation from stream banks, and employing biotechnical bank stabilization methods, such as willow wattles and biodegradable erosion control mats, where appropriate. ▪ Where applicable for overflow discharges into a creek or reservoir, install energy dissipaters, such as riprap, in the creek to minimize erosion and water quality effects. ▪ Ensure that work activities within creeks are completed during the low-flow period (between April 1 and October 15), unless otherwise approved by appropriate regulatory agencies. ▪ Store equipment and materials away from waterways to the extent feasible. No debris will be deposited within 60 feet of creeks for most WTTIP projects. ▪ Provide proper and timely maintenance for vehicles and equipment used during construction to reduce the potential for mechanical breakdowns leading to a spill of materials into or around the creeks. Conduct maintenance and fueling activities away from the creek. ▪ Install silt fencing material at the edge of established buffer zones for riparian habitat, or at the edge of the creek where no riparian habitat is present. ▪ Minimize the removal of riparian and wetland vegetation.
3.6-3 Loss of or Damage to Special-Status Plants / Sensitive Natural Communities	▪ Conduct seasonal presence/absence surveys for special-status plant species and sensitive plant communities within the limits of construction prior to construction. If identified, avoid (through facility redesign if necessary) to the extent feasible and/or establish a visible buffer zone (25 feet at minimum) prior to construction. If it is not feasible to avoid disturbance or mortality, restore special-status plant habitat and/or sensitive plant communities at an equal ratio. Develop and implement a five-year restoration mitigation and monitoring program, with appropriate performance standards. ▪ Revegetate all natural areas temporarily disturbed due to project activities and restore using locally collected plant materials specific to that community. ▪ Monitor all revegetated sites for five years using appropriate performance standards.
3.6-4: Disturbance to Nesting Special-Status Birds	▪ Schedule construction activities during the nonbreeding season (September 1 through January 31) to the extent feasible. Otherwise implement the following: – Retain a qualified wildlife biologist to conduct preconstruction surveys of all potential nesting habitat within 500 feet of construction activities where access is available. – If active nests are found during preconstruction surveys, create a no-disturbance buffer (acceptable in size to the CDFG) around active raptor nests and nests of other special-status birds during the breeding season, or until it is determined that all young have fledged. Typical buffers include 500 feet for raptors and 250 feet for other nesting birds. ▪ Conduct preconstruction burrowing owl surveys in all areas that may provide suitable habitat for this species. If present, avoid disturbing active burrowing owl nests during the breeding season and implement standard CDFG guidelines during the nonbreeding season. ▪ Avoid disturbing winter roosts of bald eagles by performing preconstruction surveys, avoiding known wintering habitat, and creating no-disturbance buffers.

TABLE S-10 (Continued)
SUMMARY OF MITIGATION MEASURES BY IMPACT

Impact	Mitigation Measure(s)
3.6-5: Disturbance to Special-Status Bat Species	▪ Prior to construction activities (i.e., ground clearing and grading, including removal of trees or shrubs) within 200 feet of trees that potential support special-status bats, retain a qualified bat biologist to survey for special-status bats. If present, create a no-disturbance buffer (acceptable in size to the CDFG) around active bat roosts during the breeding season (April 15 through August 15).
3.6-6: Disturbance to San Francisco dusky-footed woodrat	▪ Conduct preconstruction surveys to identify possible nests and, if present, avoid or relocate nests prior to construction.
3.6-7: Degradation of Aquatic Habitat and Sensitive Species	▪ Implement best management practices (BMPs) for construction activities, to reduce potential impacts to steelhead and other aquatic species and habitat resulting from sedimentation, turbidity, and accidental hazardous material inputs. ▪ Implement a biological resource education program for construction crews and contractors that includes materials describing sensitive resources, resource avoidance, permit conditions, and possible fines for violations of state or federal environmental laws. ▪ Monitor construction activities within and adjacent to aquatic and riparian habitats. ▪ Divert water from around the section of any worksite that is within the actively flowing channel of creeks. ▪ Place sediment curtains downstream of the construction or maintenance activity zone to prevent sediment disturbed during trenching activities within or near creeks. ▪ If groundwater is encountered, or if water remains within the worksite after flows are diverted, pump out of the construction area and into a suitably constructed retention basin. ▪ Install silt fencing in all areas where construction occurs within 100 feet of actively flowing water. ▪ Prepare and implement a spill prevention plan to ensure the proper handling and storage of potentially hazardous materials, as well as the proper procedures for cleaning up and reporting any spills. If necessary, construct containment berms to prevent spilled materials from reaching the creek channels. ▪ Store equipment and materials at least 60 feet from waterways. No debris (such as trash and spoils) deposition within 100 feet of wetlands. Locate staging and storage areas for equipment, materials, fuels, lubricants, and solvents outside of the stream channel and banks and within the smallest area feasible. Place drip pans under stationary equipment such as motors, pumps, generators, compressors, and welders located within or adjacent to creek. ▪ Avoid potential habitat for California red-legged frog through the use of bore-and-jack or other trenchless construction techniques. Employ reasonable and prudent measures such as environmental training, construction equipment and materials storage guidelines, silt fencing, and revegetation. ▪ Avoid disturbing western pond turtle, foothill yellow-legged frog, and their habitats by conducting pre-construction surveys to determine presence, and if appropriate, by temporarily relocating any identified western pond turtles or foothill yellow frogs upstream of the construction site, and placing temporary barriers around the construction site to prevent ingress.
3.7-1: Disturbance to Archaeological Sites	▪ In the event of accidental discovery of cultural resources, such as structural features, bone, shell, artifacts, human remains, architectural remains (such as bricks or other foundation elements), or historic archaeological artifacts (such as antique glass bottles, ceramics, horseshoes, etc.), suspend work, and retain a qualified cultural resource specialist to investigate and determine the significance of the find. ▪ Retain a qualified archaeological consultant to monitor ground-disturbing or vegetation removal activity within 500 feet of a known archaeological site. If an intact archaeological deposit is encountered, cease all soil-disturbing activities in the vicinity of the deposit, evaluate the deposit, and take appropriate remedial actions.
3.7-2: Disturbance to Paleontological Sites	▪ In the event a fossil is discovered during construction, excavations within 50 feet of the find until the discovery is examined by a qualified paleontologist, halt the significance of the find evaluated, and appropriate remedial actions taken.

TABLE S-10 (Continued)
SUMMARY OF MITIGATION MEASURES BY IMPACT

Impact	Mitigation Measure(s)
3.7-3: Disturbance or Alteration to Historic Resources	▪ Provide additional landscaping around sensitive treatment plant and distribution facilities to screen elements from view and soften their visual appearance.
3.8-1: Construction Traffic Increases **3.8-2:** Restricted Travel Lanes **3.8-3:** On-Street Parking Displacement **3.8-4:** Traffic Safety Hazards **3.8-5:** Access Disruption **3.8-6:** Transit Service Disruption	▪ Obtain any necessary road encroachment permits prior to construction. ▪ Coordinate development of a traffic safety / traffic management plan (for work in the public right-of-way) with agencies having jurisdiction over the affected roads. ▪ Develop circulation and detour plans to minimize impacts to local street circulation. Use haul routes minimizing truck traffic on local roadways to the extent possible. Use flaggers and/or signage to guide vehicles through and/or around the construction zone. ▪ Control and monitor construction vehicle movements through the enforcement of standard construction specifications by periodic onsite inspections. ▪ To the extent feasible, and as needed to avoid adverse impacts on traffic flow, schedule truck trips outside of peak morning and evening commute hours. ▪ Limit lane closures during peak hours to the extent possible. Restore roads and streets to normal operation by covering trenches with steel plates outside of allowed working hours or when work is not in progress. ▪ Limit, where possible, the pipeline construction work zone to a width that, at a minimum, maintains alternate one-way traffic flow past the construction zone. Parking may be prohibited if necessary to facilitate construction activities or traffic movement. If the work zone width loss not allow a 10-foot-wide paved travel lane, then close the road to through-traffic (except emergency vehicles) and use detour signing for alternative access streets. ▪ Include signage to direct pedestrians and bicyclists around project construction work zones that displace sidewalks and/or bike lanes. ▪ Store all equipment and materials in designated contractor staging areas on or adjacent to the worksite in such a manner to minimize obstruction to traffic. ▪ Identify locations for parking by construction workers (within the construction zone or, if needed, at a nearby location with transport provided between the parking location and the worksite). ▪ Comply with roadside safety protocols. Provide “Road Work Ahead” warning signs and speed control (including signs informing drivers of state-legislated double fines for speed infractions in a construction zone) to achieve required speed reductions for safe traffic flow through the work zone. ▪ Coordinate with facility owners or administrators of sensitive land uses such as police and fire stations, transit stations, hospitals, and schools. Provide advance notification to the facility owner or operator of the timing, location, and duration of construction activities and the locations of detours and lane closures. ▪ Coordinate construction activities, to extent possible, to minimize traffic disturbances adjacent to schools (e.g., do work during summer months when there is less activity at schools). For construction activities that occur during the school year, provide flaggers in the school areas to ensure traffic and pedestrian safety. ▪ Coordinate with the County Connection so the transit provider can temporarily relocate bus routes or bus stops in work zones as it deems necessary. ▪ To the extent feasible, and as needed to avoid adverse impacts on traffic flow, schedule construction of project elements to avoid overlapping maximum trip-generation construction phases.
3.8-7: Road Damage and Wear	▪ Prior to project construction, document road conditions for all routes to be used by project-related vehicles. Repair roads damaged by construction to a structural condition at least equal to that which existed prior to construction activity.

TABLE S-10 (Continued)
SUMMARY OF MITIGATION MEASURES BY IMPACT

Impact	Mitigation Measure(s)
3.9-1: Dust and Exhaust Emission Increases	▪ Maintain dust control within the site and provide adequate measures to prevent a dust problem for neighbors. Use water sprinkling, temporary enclosures, and other suitable methods to limit the rising of dust and dirt. Ensure that no visible dust clouds extend beyond the project boundaries or extend more than 50 feet from the source of any onsite project construction activities. ▪ Load trucks in a manner to prevent materials or debris from dropping on streets. Trim loads and remove all material from shelf areas of vehicles to prevent spillage. Take precautions when necessary to avoid cresting dust and littering by watering the load after trimming and by promptly sweeping the pavement to remove dirt and dust. ▪ Cover all trucks hauling soil, sand, and other loose materials. ▪ Pave, apply water, or apply nontoxic soil stabilizers or rock on all unpaved access roads, parking areas, and staging areas at construction sites. ▪ Sweep daily with water sweepers all paved access roads, parking areas, and staging areas at construction sites. ▪ Sweep streets daily with water sweepers if visible soil material is carried onto adjacent public streets. ▪ Hydroseed or apply nontoxic soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more). ▪ Enclose, cover, water, or apply nontoxic soil binders to exposed stockpiles (dirt, sand, etc.). ▪ Limit traffic speeds on unpaved roads to 15 miles per hour. ▪ Install sandbags or other erosion control measures to prevent silt runoff to public roadways. ▪ Replant vegetation in disturbed areas as quickly as possible. ▪ Use line power instead of diesel generators at all construction sites where line power is available. Line power will be used at the tunnel entry and exit shafts for the Orinda-Lafayette Aqueduct project. ▪ Limit the idling of all mobile and stationary construction equipment to five minutes; limit the idling of all diesel-fueled commercial vehicles (weighing over 10,000 pounds, both California- or non-California-based trucks) to 30 seconds at a school or five minutes at any location. In addition, limit the use of diesel auxiliary power systems and main engines to five minutes when within 100 feet of homes or schools while driver is resting. ▪ Operate any stationary, diesel-fueled, compression-ignition engines as part of construction of WTTIP facilities to comply with applicable fuel and fuel additive requirements and emission standards. ▪ If stationary equipment (such as generators for ventilation fans) must be operated continuously, locate such equipment at least 100 feet from homes or schools where possible. ▪ Perform tune-ups regularly for all equipment, particularly for haul and delivery trucks.
3.9-3: Ventilation Fan Emissions	▪ For any projects that would require a tunnel ventilation system, if hydrogen sulfide gas or any other odorous gases are encountered during tunnel excavation and become a nuisance odor problem (including diesel exhaust), add water scrubbers and appropriate chemicals to the ventilation system to remove the nuisance odors.
3.10-1: Construction Noise	▪ Manage construction activities at the construction site so that they do not cause daytime noise levels to exceed the 70-dBA speech interference criterion at the closest affected sensitive receptors, nor be inconsistent with local ordinances, where feasible. ▪ Limit truck operations (haul trucks and concrete delivery trucks) to specified daytime hours. ▪ Use best available noise control techniques (including mufflers, intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds) for all equipment and trucks as necessary. ▪ If impact equipment (e.g., jack hammers, pavement breakers, and rock drills) is used during project construction, use hydraulically or electric-powered equipment wherever possible to avoid the noise associated with compressed-air exhaust from pneumatically powered tools. However, where such use is unavoidable, use an exhaust muffler on the compressed-air exhaust. Use external jackets on the tools themselves, where feasible. Employ quieter procedures, such as drilling rather than impact equipment, whenever feasible. ▪ Wherever pile driving is required (possibly at tunnel shafts, jack-and-bore pit shafts, Moraga Reservoir and Tice Pumping Plant sites), predrill pile holes to minimize the duration of pile driving.

TABLE S-10 (Continued)
SUMMARY OF MITIGATION MEASURES BY IMPACT

Impact	Mitigation Measure(s)
3.10-1: Construction Noise (cont.)	▪ Locate stationary noise sources as far from sensitive receptors as possible. If they must be located near receptors, use adequate muffling (with enclosures). Orient enclosure opening or venting away from sensitive receptors. ▪ Locate material stockpiles as well as maintenance/equipment staging and parking areas as far as practicable from residences and schools. ▪ If any pipeline construction zones are located within 50 feet of school classrooms or childcare facilities, schedule pipeline construction activities (or at least the noisier phases of construction) on weekend or school vacation days to the extent feasible, avoiding weekday hours when schools are in session. ▪ Designate a contact person responsible for responding to construction-related issues, including noise. ▪ Limit construction at the WTTIP project sites to the hours of operation specified by each jurisdiction's noise ordinance except during critical water service outages or other emergencies and special situations. Where feasible, subject any equipment operating beyond these hours to the day and night noise limits of each jurisdiction for various activities in single-family residential zones. ▪ Conduct a noise monitoring program prior to implementation of any project where construction would extend beyond ordinance time limits to accurately determine baseline ambient noise levels at the closest residential receptors and to measure increases in noise levels at these receptors during a test run of equipment proposed to be operated on the site during the more noise-sensitive nighttime hours. Adjust project noise limits and/or incorporate additional control measures (e.g., sound barriers) as engine controls, appropriate depending on the results of this monitoring program. ▪ At the Upper San Leandro WTP, make a reasonable effort to limit operation of impact construction equipment to less than 10 days to be consistent with Oakland Noise Ordinance construction noise limits. However, if this limit cannot be met, construction at this site will occur in a manner consistent with the Oakland City Council Adopted Construction Noise Mitigation Measures to the extent feasible. ▪ Reduce construction-related noise levels associated with the Orinda-Lafayette Aqueduct and any other WTTIP projects that involve construction of tunnel shafts (including jack-and-bore pits) by retaining an acoustical engineer to design sound abatement measures that will meet the local ordinance limits, to the extent possible. Among other things, the acoustical engineer will provide design specifications for the sound barrier design and the specific ventilation fan to be used (based on type, size, orientation, location, exhaust, etc.) at tunnel portals. ▪ Use quiet tunnel ventilation fans directed away from sensitive receptors. Additional measures that could be employed to reduce fan noise, if necessary, include enclosing fans, treating the interior surface of the enclosure for acoustical absorption, or using silencers or acoustically lined inlet plena to control the inlet noise. ▪ Prior to construction, take baseline noise measurements at the entry and exit shafts. If baseline ambient noise levels already exceed applicable noise ordinance limits at the closest residential receptors, adjust the project noise limits appropriately so that construction noise levels do not result in a noticeable increase in ambient noise levels at these receptors. ▪ Cease loader operations at the surface (the area outside the tunnel shaft) in the tunnel portal vicinities at 6 p.m. on weekdays and do not operate on weekends except during critical water service outages or other emergencies and special situations. ▪ Construct bins used to transport spoils, including rocks and debris, of nonmetallic material or have a nonmetallic liner (such as cardboard), if feasible. Perform muck box tipping/dumping at the surface in a manner that minimizes clanging, banging, or booming noises (metal to metal contact) during evening and nighttime hours (6 p.m. to 8:00 a.m. on weekdays). ▪ Restrict underground controlled detonation in the tunnel shaft areas to the hours of 8:00 a.m. to 6:00 p.m. Limit the amount of explosive and the delay times of any explosive charges used so as to produce a maximum noise level at the closest adjacent receptor of 60 dBA (Ldn). ▪ Do not operate backup alarms on any equipment during nighttime hours (10:00 p.m. to 7:00 a.m.). ▪ Erect sound barriers around the tunnel entry and exit shafts to minimize noise impacts on adjacent receptors. ▪ Locate proposed jack-and-bore pits as far from sensitive receptors as technically feasible. ▪ Wherever a sensitive receptor is located within 150 feet of a construction site at a treatment plant, reservoir, or pumping plant, and at both tunnel shafts, provide temporary sound barriers between the construction site and the closest receptors to reduce noise levels to below the speech interference criterion at the closest receptor. Use sound-absorbing blankets at appropriate locations as necessary. ▪ Locate any openings in sound barriers that are provided for truck/vehicle access away from sensitive receptors.

TABLE S-10 (Continued)
SUMMARY OF MITIGATION MEASURES BY IMPACT

Impact	Mitigation Measure(s)
3.10-3: Construction Vibration	▪ Limit surface vibration to no more than 0.5 in/sec PPV, measured at the nearest residential or other sensitive structure. Conduct monitoring to verify. ▪ Prior to any controlled detonations, perform tests to determine the rock properties so that vibrations from the blast remain within the required PPV limit of 0.5 in/sec at the nearest structure. ▪ To the extent possible, notify residents in the potentially affected area in advance of controlled detonation activities.
3.10-4: Operational Noise	▪ Enclose pumping and emergency generator facilities, and locate vents on the building facades facing away from adjacent residential receptors. ▪ Construct masonry sound barriers around transformers, and make substations of sufficient height to provide at least 10 dB or more of noise attenuation.
3.11-1: Exposure to Hazardous materials in Soil	▪ For construction of all facilities requiring excavation of more than 50 cubic yards of soil, conduct a Phase I and, if warranted, Phase II environmental site assessment and take remedial actions as appropriate.
3.11-2: Exposure to Hazardous Materials Related to Building Demolition	▪ Conduct a hazardous building materials survey for each of the structures subject to demolition or renovation activities and take appropriate abatement action, such as containment and/or removal.
3.12-1: Damage to Existing Utilities	▪ Locate overhead and underground utility lines, such as natural gas, electricity, sewage, telephone, fuel, and water lines that may reasonably be expected to be encountered during excavation work. ▪ Highlight all high-priority utilities in construction drawings. ▪ Coordinate regularly on planned excavation occurring near a high priority utility. ▪ Specify a safe distance to work near high-pressure gas lines, and do not authorize excavation closer to the pipeline until the designated health and safety officer confirms and documents in the construction records that: (1) the line was appropriately located in the field by the utility owner using as-built drawings and a pipeline-locating device, and (2) the location was verified by hand by the construction contractor. ▪ Protect, support, or remove underground utilities as necessary to safeguard employees. ▪ Notify local fire departments any time damage to a gas utility results in a leak or suspected leak, or whenever damage to any utility results in a threat to public safety. ▪ Promptly contact utility owner if any damage occurs as a result of the project and reconnect disconnected cables and lines with owner approval. ▪ Observe Department of Health Services (DHS) standards, which require: (1) a 10-foot horizontal separation between parallel sewage and water mains (gravity or force mains); (2) a 1-foot vertical separation between perpendicular water and sewage line crossings; and (3) encasement of sewage mains in protective sleeves where a new water line crosses under or over an existing wastewater main. ▪ Coordinate final construction plans and specifications with affected utilities, such as PG&E.
3.12-4: Landfill Capacity Reduction	▪ Encourage project facility design and construction methods that produce less waste, or that produce waste that could more readily be recycled or reused.