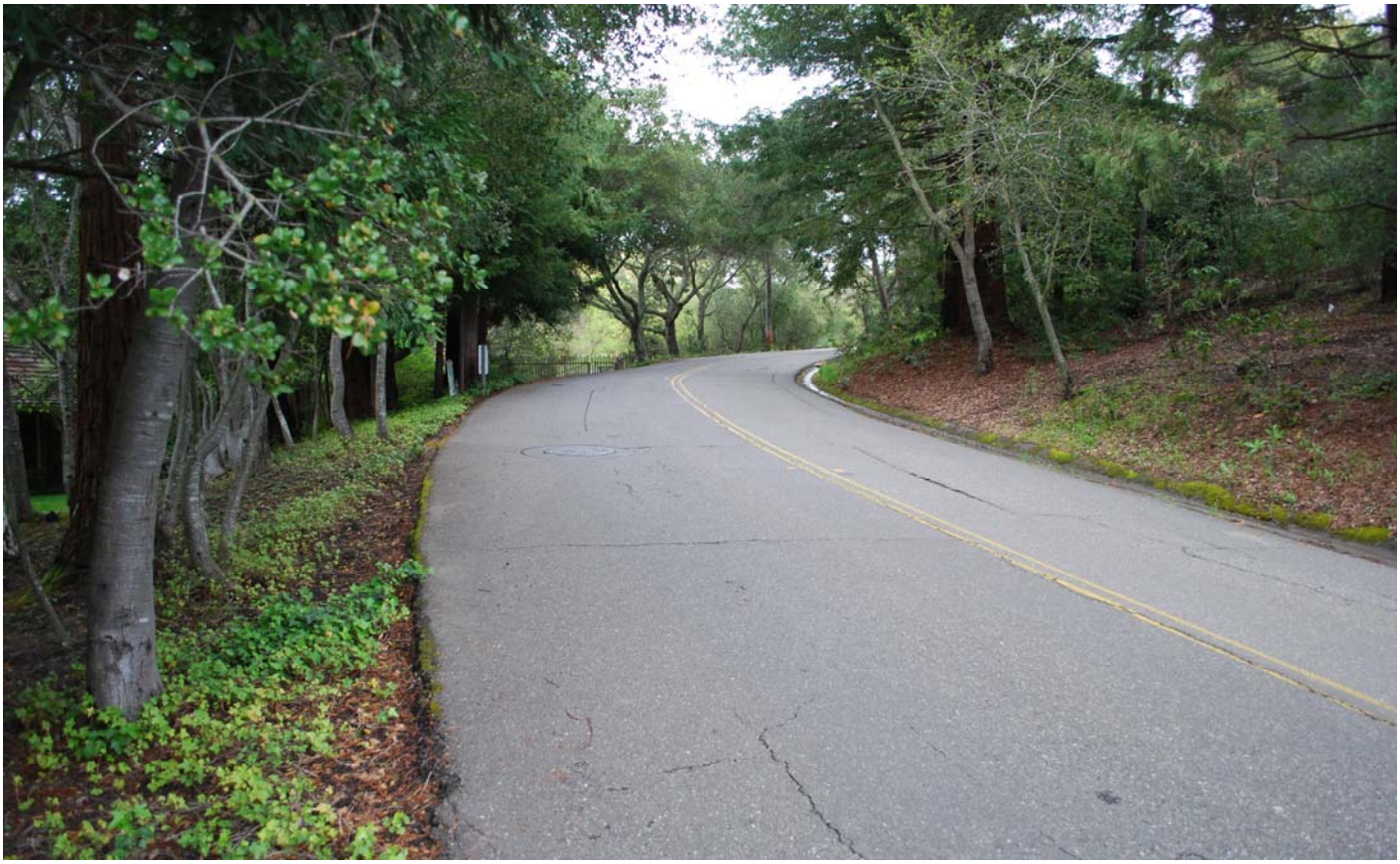
EBMUD HAPPY VALLEY PIPELINE PROJECT

Draft Supplemental Environmental Impact Report

Prepared for

East Bay Municipal Utility District

November 2010



Notice of Availability
Happy Valley Pipeline Project
City of Orinda
Draft Supplemental Environmental Impact Report
November 19, 2010

Notice is hereby given that a Draft Supplemental Environmental Impact Report (SEIR) is available for public review. The project proponent is the East Bay Municipal Utility District (EBMUD), 375 Eleventh Street, Oakland California 94607-4240. EBMUD is also the lead agency, pursuant to the California Environmental Quality Act (CEQA).

Project Description: In December 2006, the EBMUD Board of Directors approved the Water Treatment and Transmission Improvements Program (WTTIP) and certified the Environmental Impact Report (EIR) on the WTTIP. Since then, EBMUD has advanced the design of some original WTTIP projects and is now proposing to modify one of the those projects - the Happy Valley Pipeline in the City of Orinda - in order to reduce traffic disruption during construction and address reliability problems with an existing pipeline. Construction of the pipeline is occurring in two phases: Phase I and Phase II. Construction of Phase I on Miner Road between Oak Arbor Road and Lombardy Lane was completed during the summer months of 2009. The proposed pipeline alignment for Phase II consists of three distinct segments of new 16-inch-diameter water pipeline. The first segment originates at the end of the Phase I alignment at Miner Road and Lombardy Lane and ends at the intersection of Miner Road and Tiger Tail Court. The second segment follows two existing District right-of-ways between Miner Road and Van Ripper Lane that traverses a ravine and Lauterwasser Creek. After crossing Lauterwasser Creek, the third segment follows Van Ripper Lane easterly and ends at the intersection of Van Ripper Lane and Lombardy Lane. The District has determined that road closure with restricted access would be necessary for pipeline installation on portions of Miner Road and on Van Ripper Lane. Pipeline construction in public roadways is proposed to occur from 9:00 a.m. to 9:00 p.m. Monday through Friday and within District right-of-ways between 8:00 a.m. to 6:00 p.m. Monday through Friday. Construction would commence when the school summer vacation begins in 2013. Consistent with CEQA, the SEIR evaluates environmental impacts associated with the proposed pipeline alignment for Phase II.

Significant Impacts: The WTTIP EIR identified significant impacts for the original Happy Valley Pipeline for the following resources: visual quality, water quality, biological resources, cultural resources, traffic, air quality, noise, hazards, public services and utilities, geology and soils, cumulative impacts, and secondary effects of growth. Most of these impacts would be mitigated to less-than-significant levels by implementation of mitigation measures. However, construction noise along Miner Road and Van Ripper Lane for Phase II would extend beyond the time limits specified by the Orinda Noise Ordinance and, therefore, is considered significant and unavoidable.

Public Review: Persons interested in reviewing the Draft SEIR or receiving a copy of the Draft SEIR should contact *David Katzev, EBMUD, at (510) 287-2050.* The Draft SEIR and all documents referenced in the SEIR are available for public review at the EBMUD office, 375 Eleventh Street, Oakland. The Draft SEIR is also available for public review at the Orinda Library, 24 Orinda Way, Orinda, or on the internet at EBMUD's website **www.ebmud.com**.

Public meetings: A public meeting has been scheduled to review the Draft SEIR. The meeting will be held Tuesday, December 14, 2010, at 6:30 p.m., Orinda Community Center, 26 Orinda Way, Orinda.

Deadlines: The public review period is November 19, 2010 through January 14, 2011. Comments must be received by January 14, 2011, at 4:30 p.m. Written comments should be submitted to *David Katzev, Associate Civil Engineer, MS #701*, 375 Eleventh Street, Oakland CA 94607-4240 or emailed to happy.valley.pipeline@ebmud.com. Action on the Draft SEIR is currently scheduled to be taken by the EBMUD Board of Directors at a regularly scheduled board meeting in March 2011, at 375 Eleventh Street, Oakland, California.

EBMUD HAPPY VALLEY PIPELINE PROJECT

Draft Supplemental Environmental Impact Report

Prepared for

East Bay Municipal Utility District

November 2010

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SUMMARY

S.1 Introduction

This Draft Supplemental Environmental Impact Report (SEIR) assesses the potential impacts of proposed changes to the Happy Valley Pipeline Project proposed by the East Bay Municipal Utility District (EBMUD or District). 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:

David Katzev, Project Manager
Water Distribution Planning Division
East Bay Municipal Utility District
375 Eleventh Street (Mail Slot #701)
Oakland, CA 94607-4240
Email: happy.valley.pipeline@ebmud.com

S.2 Project Description

EBMUD supplies and treats water for most of Alameda and Contra Costa Counties. In December 2006, the EBMUD Board of Directors approved the Water Treatment and Transmission Improvements Program (WTTIP) and certified an Environmental Impact Report (EIR) on the WTTIP (State Clearinghouse No. 2005092019). The purpose of the WTTIP is to address water treatment, transmission and distribution system needs in EBMUD's service area, particularly in Lafayette, Moraga, Orinda, and western Walnut Creek, through the year 2030. The WTTIP includes over 20 projects involving treatment plant facilities and transmission and distribution system pipelines, pumping plants, and reservoirs. EBMUD has advanced the design of some WTTIP projects following EIR certification and, based on refinements to design and construction assumptions, is proposing to modify one of the WTTIP projects: the Happy Valley Pipeline Project. This SEIR analyzes proposed modifications to the Happy Valley Pipeline alignment. Construction of the pipeline is occurring in two phases: Phase I and Phase II. Construction of Phase I between Oak Arbor Road and Lombardy Lane was completed during the summer months of 2009. The proposed pipeline alignment for Phase II consists of three distinct segments of new 16-inch-diameter water pipeline. The first segment originates at the Miner Road and Lombardy Lane intersection and ends at the Miner Road and Tiger Tail Court where the new pipeline would connect with an existing 12-inch pipe. The second segment follows two existing District right-of-ways (ROW) between Miner Road and Van Ripper Lane that traverses a ravine and Lauterwasser Creek. The proposed pipe would tie into the existing 12-inch pipe on the northern slope of the

ravine (south of residents at 85 and 89 Van Ripper Lane). The existing 12-inch pipe extends to Van Ripper Lane. The third segment would tie into the existing 12-inch pipe and extend approximately 450 feet in Van Ripper Lane to Lombardy Lane. The District has determined that road closure with restricted access would be necessary for pipeline installation on Miner Road (between Lombardy Lane and Tiger Tail Court) and on Van Ripper Lane (between Lombardy Lane and the point where the District right-of-way intersects between 85 and 89 Van Ripper Lane). Additionally, the District is proposing to extend construction hours for pipeline construction in public roadways from 9:00 a.m. to 9:00 p.m. (instead of 8:30 a.m. to 4:30 p.m.) and start immediately after the school summer vacation begins.

S.3 Summary of Impacts

Table S-1 at the end of this chapter summarizes impacts associated with the Happy Valley Pipeline Project as analyzed in the WTTIP EIR as compared with impacts analyzed in the document for the proposed project. **Appendix A** presents the Mitigation Monitoring and Reporting Program (MMRP) for the project, and describes in full the measures EBMUD has identified to minimize or avoid the project's impacts. Mitigation measures identified in the MMRP include those identified in the WTTIP EIR that are applicable to the Happy Valley Pipeline Project, and those identified in this SEIR. In some cases, measures identified in the WTTIP EIR have been revised in light of the new pipeline alignment and updated analysis.

S.4 Analysis of Alternatives

Chapter 4 of this SEIR evaluates project alternatives (as well as a "No Project" alternative) that would alter the proposed pipeline alignment and construction methods to avoid impacts associated with the proposed project. The Lombardy Lane Alternative is the route of the Happy Valley Pipeline Project that was approved as part of the WTTIP. While the preferred pipeline route has been revised based on further analysis, this SEIR reviews the Lombardy Lane Alternative to provide decision-makers and the public with a side-by-side comparison of the two alignments. The Brookbank Road/Van Ripper Lane Alternative is an alternative route that would be constructed primarily within Brookbank Road and Van Ripper Lane with a horizontal directional drilling undercrossing of Lauterwasser Creek. The No Road Closure Alternative considers construction of the proposed project without the proposed road closures.

S.5 Issues to be Resolved

The proposed project includes replacement of an existing pipeline that is encased in concrete within the bed and banks of Lauterwasser Creek. The project includes removal of the existing pipeline, construction of the new pipeline, and restoration of the bed and bank of Lauterwasser Creek to protect the habitat value of the creek. Specific measures to be used to restore the creek bed and banks, stabilize the steep creek bank**,** and prevent erosion will be determined by EBMUD in consultation with the U.S. Army Corps of Engineers and the California Department of Fish and Game, which have regulatory oversight of construction within streams.

Regarding controversy over the proposed project, the currently proposed pipeline alignment arose from an agreement between EBMUD and the City of Orinda after certification of the final WTTIP EIR, whereby EBMUD agreed to investigate options to the previously proposed pipeline route in Lombardy Lane to minimize road closures during construction. After completing a detailed alternatives analysis, EBMUD determined that the currently proposed alignment would reduce traffic impacts relative to the previous alignment.

In addition to concerns on traffic and access interruptions, other public concerns have been raised during discussions with adjacent landowners and during a public meeting held by EBMUD for the project on June 8, 2010 at the Orinda Community Center. Concerns raised by community members include: interruption of flows in Lauterwasser Creek during construction, creek bank stability and erosion, interruption in water service during construction, the extent of construction activities and type of equipment that would be used in the District's cross-country ROW, and the duration of the construction process.

TABLE S-1
COMPARISON OF HAPPY VALLEY PUMPING PLANT AND PIPELINE AS ANALYZED IN WTTIP EIR AND WITH PROPOSED CHANGES ANALYZED IN THIS SEIR

Project-Level Element / Impacts	WTTIP EIR Happy Valley Pumping Plant and Pipeline	Happy Valley Pipeline with Proposed Changes	Discussion
Land Use, Planning, and Recreation			
Divide an Established Community	LTS	SM+	As with the Happy Valley Pipeline analyzed in the WTTIP EIR, the proposed project would not impact agricultural or recreational resources. Similar impacts related to the division of an established community would occur due to construction noise, access disruption, and air quality emissions. With mitigation, this impact would be less than significant.
Agricultural Resources Impacts	LTS	LTS=	
Recreation Resources Impacts	LTS	LTS=	
Visual Quality			
Short-Term Visual Effects during Construction	LTS	LTS=	Most visual impacts would not change with the proposed project changes. Effects on scenic resources would be slightly greater due to tree removal in the District's ROW and construction work in Lauterwasser Creek. With mitigation, these impacts would be less than significant.
Alteration of Appearance of WTTIP Sites	SM	SM=	
Effects on Views	SM	SM=	
Effects on Scenic Vistas	LTS	SM+	
New Sources of Light and Glare	LTS	LTS=	
Geology, Soils, and Seismicity			
Slope Stability	SM	SM+	Because the revised alignment crosses the steep banks of Lauterwasser Creek, the proposed project would have a greater potential for impacts associated with slope stability and erosion. Other potential geologic hazards associated with expansive soils and liquefaction would be similar to the Happy Valley Pipeline analyzed in the WTTIP EIR. With mitigation, these impacts would be less than significant.
Groundshaking	SM	SM=	
Expansive Soils	SM	SM=	
Liquefaction	SM	SM=	
Squeezing Ground	--	--	
Subsidence	--	--	
Erosion or loss of topsoil	--	SM+	
Hydrology and Water Quality			
Degradation of Water Quality During Construction	SM	SM+	Due to construction in Lauterwasser Creek, the potential for short-term and long-term water quality impacts would be greater than the WTTIP EIR project. Other potential hydrology and water quality impacts associated with groundwater dewatering, changes in impervious surfaces, and discharge of chloraminated water would be similar to the Happy Valley Pipeline analyzed in the WTTIP EIR. With mitigation, these impacts would be less than significant.
Groundwater Dewatering	LTS	LTS=	
Diversion of Flood Flows	SM	SM=	
Discharge of Chloraminated Water during Construction	--	LTS	
Operational Discharge of Chloraminated Water	--	--	
Change in Impervious Surfaces	LTS	LTS=	
Alteration of Long-Term Drainage Patterns	--	SM+	
Long-term Degradation of Water Quality	--	LTS+	

[a] Impacts summarized; please see Chapter 3 for details.

LTS = Less Than Significant
SM = Significant and Mitigable
SU = Significant and Unavoidable
-- = Impact does not apply
N/A = Impact was not required for analysis under CEQA

\+ Impact would be greater than that identified in the WTTIP EIR
– Impact would be less than that identified in the WTTIP EIR
= Impact would be the same (or similar) to that identified in the WTTIP EIR

TABLE S-1 (continued)
COMPARISON OF HAPPY VALLEY PUMPING PLANT AND PIPELINE AS ANALYZED IN WTTIP EIR AND WITH PROPOSED CHANGES ANALYZED IN THIS SEIR

Project-Level Element / Impacts	WTTIP EIR Happy Valley Pumping Plant and Pipeline	Happy Valley Pipeline with Proposed Changes	Discussion
Biological Resources			
Loss of or Damage to Protected Trees	SM	SM+	Changes in the proposed pipeline alignment would result in construction of a ROW segment that would require removal of trees. Construction in habitat adjacent to Lauterwasser Creek could potentially impact Alameda whipsnakes passing through the area. Other potential biological resource impacts would be similar to the Happy Valley Pipeline analyzed in the WTTIP EIR. With mitigation, these impacts would be less than significant.
Degradation to Streams, Wetlands, and Riparian Habitats	SM	SM+	
Loss of or Damage to Special-Status Plants	SM	SM=	
Disturbance to Special-Status Birds	SM	SM=	
Disturbance to Special-Status Bats	SM	SM=	
Disturbance to San Francisco Dusky-Footed Woodrat	SM	SM=	
Degradation of Special-Status Aquatic Species Habitat	SM	SM=	
Disruption to Wildlife Corridors	LTS	LTS=	
Adverse Effects to Alameda Whipsnake	--	SM+	
Cultural Resources			
Archaeological Resources, including Unrecorded Cultural Resources	SM	SM=	Cultural resources impacts would not change due to proposed project changes. With mitigation, these impacts would be less than significant.
Paleontological Resources	SM	SM=	
Historic Settings	LTS	LTS=	
Traffic and Circulation			
Increased Traffic	SM	SM=	The proposed pipeline route has been moved from Lombardy Lane to Miner Road. This will reduce traffic impacts as Miner Road has substantially less traffic than Lombardy Lane. Transit impacts would also be less severe because County Connection Bus Line 126 service in the project area has been discontinued since publication of the WTTIP EIR. Other potential traffic impacts would be similar to the Happy Valley Pipeline analyzed in the WTTIP EIR. With mitigation, these impacts would be less than significant.
Reduced Road Width	SM	SM=	
Parking	SM	SM=	
Traffic Safety	SM	SM=	
Access	SM	SM=	
Transit	SU	SM-	
Pavement Damage/Wear	SM	SM=	
Air Quality			
Construction Emissions	SM	SM=	Air quality impacts from construction of the proposed project would be similar to those identified in the WTTIP EIR. With mitigation, these impacts would be less than significant.
Diesel Particulate Emissions along Haul Routes	LTS	LTS=	
Tunnel-Related Emissions	--	--	
Operational Pollutant Emissions at Treatment Facilities	--	--	
Operational Odor Emissions	LTS	LTS=	

[a] Impacts summarized; please see Chapter 3 for details.

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TABLE S-1 (continued)
COMPARISON OF HAPPY VALLEY PUMPING PLANT AND PIPELINE AS ANALYZED IN WTTIP EIR AND WITH PROPOSED CHANGES ANALYZED IN THIS SEIR

Project-Level Element / Impacts	WTTIP EIR Happy Valley Pumping Plant and Pipeline	Happy Valley Pipeline with Proposed Changes	Discussion
Air Quality (cont.)			
Secondary Emissions from Electricity Generation	LTS	LTS=	
Noise and Vibration			
Construction Noise Increases	SM	SU	Changes in the proposed pipeline alignment would result in construction of a ROW segment between homes on Miner Road and Van Ripper Lane. Homes located near this pipeline segment would be subject to noise and vibration for approximately one month. With mitigation, these impacts would be less than significant. However, pipeline construction in Miner Road and Van Ripper Lane is proposed to occur from 9:00 a.m. to 9:00 p.m., Monday through Friday, which extends beyond the time limits specified by the Orinda Noise Ordinance (8 a.m. to 6 p.m.). This would result in a significant and unavoidable impact.
Noise Increases along Haul Routes	LTS	LTS=	
Construction-Related Vibration Effects	SM	SM+	
Operational Noise Increases	LTS	LTS=	
Greenhouse Gas Emissions			
Greenhouse Gas Construction Emissions	N/A	LTS	Amendments to the CEQA Guidelines adopted in 2010 require consideration of project-generated greenhouse gas emissions. The proposed Happy Valley Pipeline would result in less-than-significant greenhouse gas emissions.
Hazards and Hazardous Materials			
Hazardous Materials in Soil and Groundwater	SM	SM=	Hazardous materials impacts would not change due to proposed project changes.
Hazardous Building Materials	--	--	
Gassy Conditions in Tunnels	--	--	
High-Pressure Gas Line Rupture	SM	SM=	
Wildland Fires	LTS	LTS=	
Release from Construction Equipment	LTS	LTS=	
Accidental Release during Operation	--	--	
Public Services and Utilities			
Disruption of Utility Lines	SM	SM=	Impacts to public services and utilities would not change due to proposed project changes.
Increase in Electricity Demand	LTS	LTS=	
Increase in Public Services Demand	LTS	LTS=	
Adverse Effect on Landfill Capacity	SM	SM=	
Failure to Achieve State Diversion Mandates	SM	SM=	

[a] Impacts summarized; please see Chapter 3 for details.

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CHAPTER 1.0
Introduction

1.1 Project Overview

East Bay Municipal Utility District (EBMUD) supplies and treats water for most of Alameda and Contra Costa Counties. In December 2006, the EBMUD Board of Directors approved the Water Treatment and Transmission Improvements Program (WTTIP) and certified an Environmental Impact Report (EIR) on the WTTIP (State Clearinghouse No. 2005092019). The purpose of the WTTIP is to address water treatment, transmission and distribution system needs in EBMUD's service area, particularly in Lafayette, Moraga, Orinda, and western Walnut Creek, through the year 2030. The WTTIP includes over 20 projects involving treatment plant facilities and transmission and distribution system pipelines, pumping plants, and reservoirs.

EBMUD has advanced the design of some WTTIP projects following EIR certification and, based on refinements to design and construction assumptions, is proposing to modify one of the WTTIP projects: the Happy Valley Pipeline Project (proposed project) in order to reduce traffic disruption during construction and address reliability problems with an existing pipeline in the vicinity. The project site is located in the City of Orinda, north of Highway 24 and east of Camino Pablo. EBMUD divided the pipeline project into two phases to improve coordination between various utility and City of Orinda projects and to minimize construction disturbance to local residents. The first 1,400 feet of pipeline is referred to as Phase I and follows Miner Road from Oak Arbor Road to Lombardy Lane; design and construction of Phase I was completed in 2009. The next segment of the pipeline alignment is referred to as Phase II and the route identified in the WTTIP EIR follows Lombardy Lane from Miner Road to Van Ripper Lane. Instead of following Lombardy Lane, the current proposed Phase II route would follow Miner Road. The new route begins at the Miner Road/Lombardy Lane intersection and follows Miner Road to an existing EBMUD right-of-way (ROW) between the homes at 557 and 559 Miner Road. The alignment heads northwest between these homes, crosses Lauterwasser Creek, and continues along another EBMUD ROW between the homes at 85 and 89 Van Ripper Lane. From Van Ripper Lane, the alignment heads north and ends at Lombardy Lane.

1.2 CEQA Process

The WTTIP EIR analysis of impacts associated with project construction assumed that the pipeline alignment would follow Lombardy Lane. Since EBMUD is proposing an alternative route, the proposed change in pipeline alignment would alter environmental impacts disclosed in the WTTIP EIR. Consequently, consistent with the *CEQA Guidelines*, EBMUD has prepared this Supplemental EIR (SEIR) to inform agencies and the public about the proposed modification to the Happy Valley

Pipeline, to evaluate the environmental impacts associated with the modification, and to identify measures to reduce such impacts.

This document references the WTTIP EIR that was certified in December 2006. Note that the documents are referred to as the WTTIP EIR and the SEIR, respectively.

This document supplements the analysis presented in the WTTIP EIR by describing the proposed modifications to the project and evaluating their potential (a) to generate significant impacts not disclosed in the WTTIP EIR and (b) change the severity of significant impacts disclosed in the WTTIP EIR. Those portions of the WTTIP EIR that address the Happy Valley Pumping Plant and Pipeline are incorporated by reference and summarized in this SEIR. Those portions of the Findings and Mitigation Monitoring and Reporting Program adopted for the WTTIP EIR that pertain to the Happy Valley Pumping Plant and Pipeline also are incorporated by reference and summarized herein (see Appendix A). The WTTIP EIR is available for review at www.ebmud.com; the Findings and Mitigation Monitoring and Reporting Program and printed copies of the WTTIP EIR are available at the address listed below.

The issues evaluated in detail in this SEIR include the following: land use, planning, and recreation; visual quality; geology, soils, and seismicity; hydrology and water quality; biological resources; cultural resources; traffic and circulation; air quality; noise and vibration; and greenhouse gas emissions.

Circulation of the Draft SEIR

This Draft SEIR will be available to local, state, and federal agencies and to interested organizations and individuals who may want to review and comment on the report. Notice of this Draft SEIR will also be sent directly to every agency, person, or organization that has requested notification. The SEIR will also be available online at the EBMUD webpage (www.ebmud.com). The publication of the Draft SEIR marks the beginning of a 45-day public review period. During the 45-day review period, written comments should be mailed or hand delivered to:

David Katzev
Associate Civil Engineer
East Bay Municipal Utility District
375 Eleventh Street (Mail Slot #701)
Oakland, CA 94607-4240

Final SEIR

Written and oral comments received on this Draft SEIR will be addressed in a Response to Comments document which, together with this Draft SEIR, will constitute the Final SEIR. The Response to Comments document will also stipulate any changes to the Draft SEIR resulting from public and agency input.

After the Final SEIR has been completed, the EBMUD Board of Directors will then consider SEIR certification at a regularly scheduled Board meeting in 2011. Upon SEIR certification,

EBMUD may proceed with project approval actions. CEQA requires that the lead agency neither approve nor implement a project unless the project's significant environmental effects have been reduced to less-than-significant levels, essentially "eliminating, avoiding, or substantially lessening" the expected impacts unless specific findings are made. If the lead agency approves the project despite residual significant adverse impacts that cannot be mitigated to less-than-significant levels, the agency must state the reasons for its action in writing in a "Statement of Overriding Considerations." The Statement of Overriding Considerations must be included in the record of project approval.

Mitigation Monitoring and Reporting

State law requires lead agencies to adopt a mitigation monitoring and reporting program for those changes to the proposed project that it has adopted or made a condition of approval in order to mitigate or avoid significant effects on the environment. All adopted measures will be included in an updated mitigation monitoring and reporting program to verify compliance.

CHAPTER 2.0
Description of the Proposed Project

This chapter contains the following sections:

2.1 Introduction

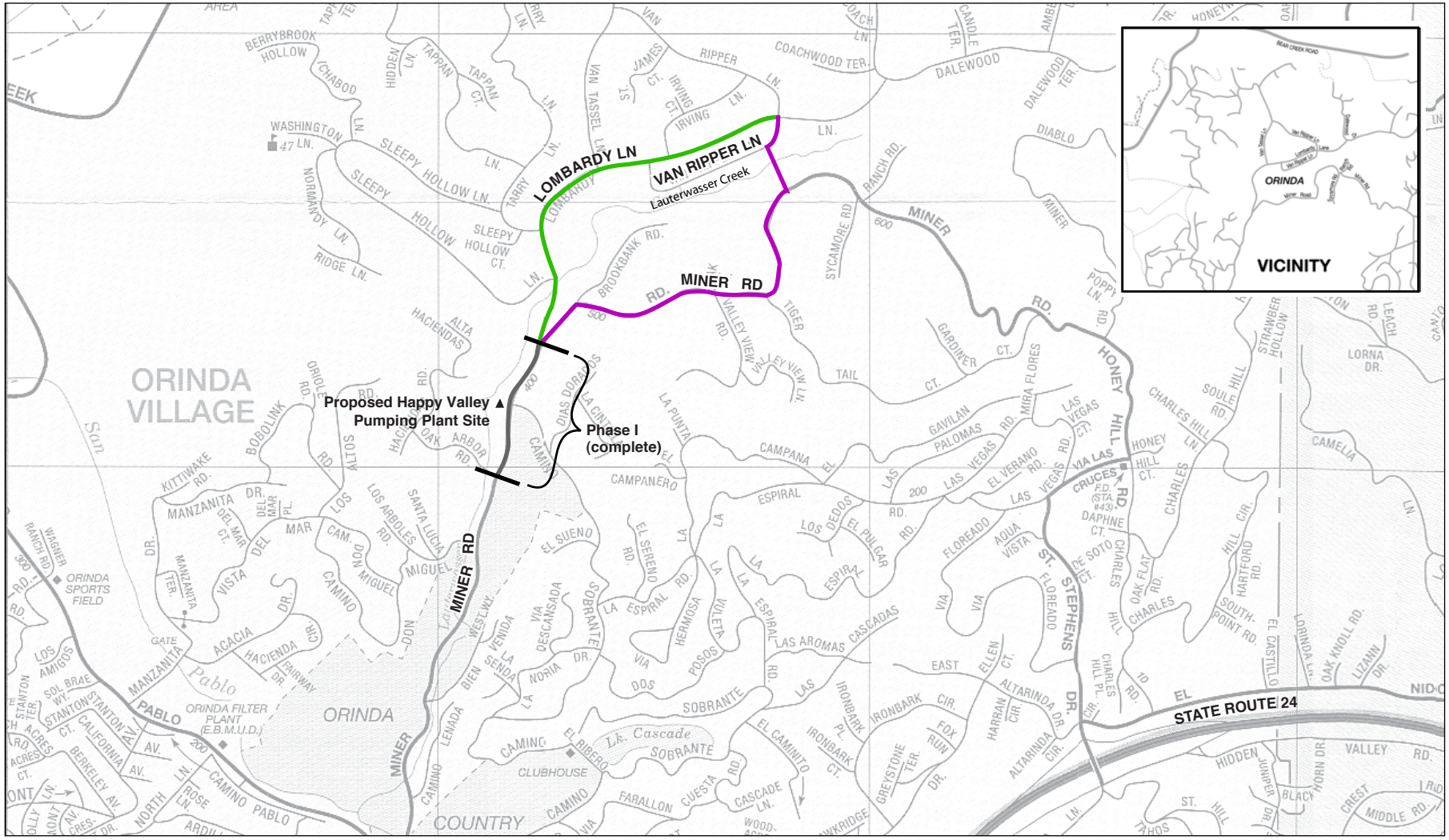
This SEIR analyzes proposed modifications to the pipeline alignment of the Happy Valley Pipeline project (proposed project). The Happy Valley Pipeline project is part of the Happy Valley Pumping Plant and Pipeline project included in the Water Treatment and Transmission Improvements Program (WTTIP). The Happy Valley Pipeline alignment that was identified in the WTTIP and evaluated in the WTTIP Environmental Impact Report is described in this chapter in order to provide context. The proposed changes analyzed in this SEIR are described in Section 2.3.2 below.

The EBMUD Board of Directors adopted as conditions of WTTIP Project approval numerous measures to mitigate potential environmental impacts associated with the Happy Valley Pumping Plant and Pipeline. Those measures (as revised in Chapter 3 of this SEIR) are now considered part of the proposed project. The mitigation measures are included in Appendix A of this SEIR, the WTTIP EIR Mitigation Monitoring and Reporting Plan (MMRP) – Happy Valley Pipeline Project.

Consistent with the MMRP, the District has retained a traffic consultant to prepare a preliminary traffic control plan and would retain a traffic consultant to prepare the final traffic control plan for the Happy Valley Pipeline project. Information currently available on the Traffic Control Plan has been incorporated into Chapter 3 of this SEIR (Section 3.2.2, Traffic and Circulation).

2.1.1 Happy Valley Pipeline Alignment

The Happy Valley Pipeline project would be located in the City of Orinda, California. **Figures 2-1** and **2-2** show the general location of the alignment for the proposed project on street and aerial maps. Figure 2-1 shows the original alignment in the WTTIP EIR as well as the proposed Miner Road alignment. As indicated in Figure 2-1, Phase I of pipeline construction in Miner Road has been completed between Oak Arbor Road and Lombardy Lane. The proposed alignment for Phase II consists of three distinct segments of new 16-inch-diameter water pipeline. The first segment originates at the Miner Road and Lombardy Lane intersection and ends at the intersection



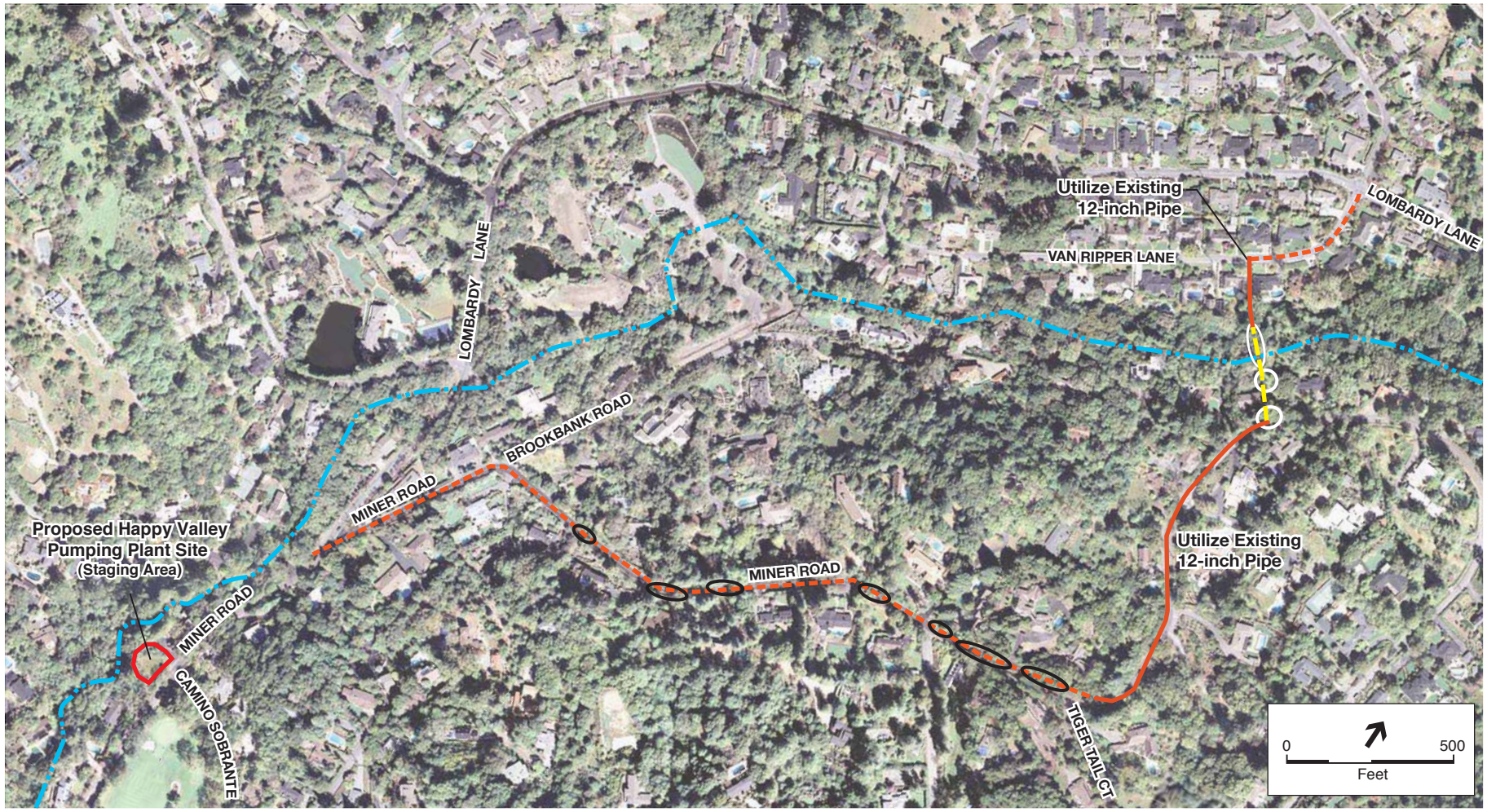
PHASE II PIPELINE ROUTES

- Lombardy Lane / Original Route
- Miner Road / Proposed Route

SOURCE: EBMUD, 2010

Happy Valley Pipeline SEIR . 204369.02

Figure 2-1
Project Location



SOURCE: EBMUD, 2010

Happy Valley Pipeline SEIR . 204369.02

Figure 2-2
Proposed Happy Valley Pipeline Alignment

of Miner Road and Tiger Tail Court where the new pipeline would connect with an existing 12-inch pipe. Between Tiger Tail Court and a location approximately 1,150 feet to the north along Miner Road, the existing 12-inch pipeline would be used (no new pipe would be installed). The second segment, shown in more detail in **Figure 2-3**, follows two existing District right-of-ways (ROW 660 and 666) between Miner Road and Van Ripper Lane that crosses the Lauterwasser Creek ravine. The proposed pipe would tie into an existing 12-inch pipe on the northern slope of the ravine (south of residents at 85 and 89 Van Ripper Lane). The existing 12-inch pipe extends to Van Ripper Lane. The third segment would tie into the existing 12-inch pipe in the District ROW (between 85 and 89 Van Ripper Lane) and extend approximately 450 feet in Van Ripper Lane to Lombardy Lane.

2.1.2 Happy Valley Pipeline Alignment Segment Analyzed in this SEIR

This document analyzes Phase II of the Happy Valley Pipeline alignment from the end of the pipeline completed in Phase I (Miner Road at Lombardy Lane) to the Lombardy Lane/Van Ripper Lane intersection, as described in Section 2.1.1 and as indicated in Figure 2-1.

2.2 Objectives of and Need for the Project

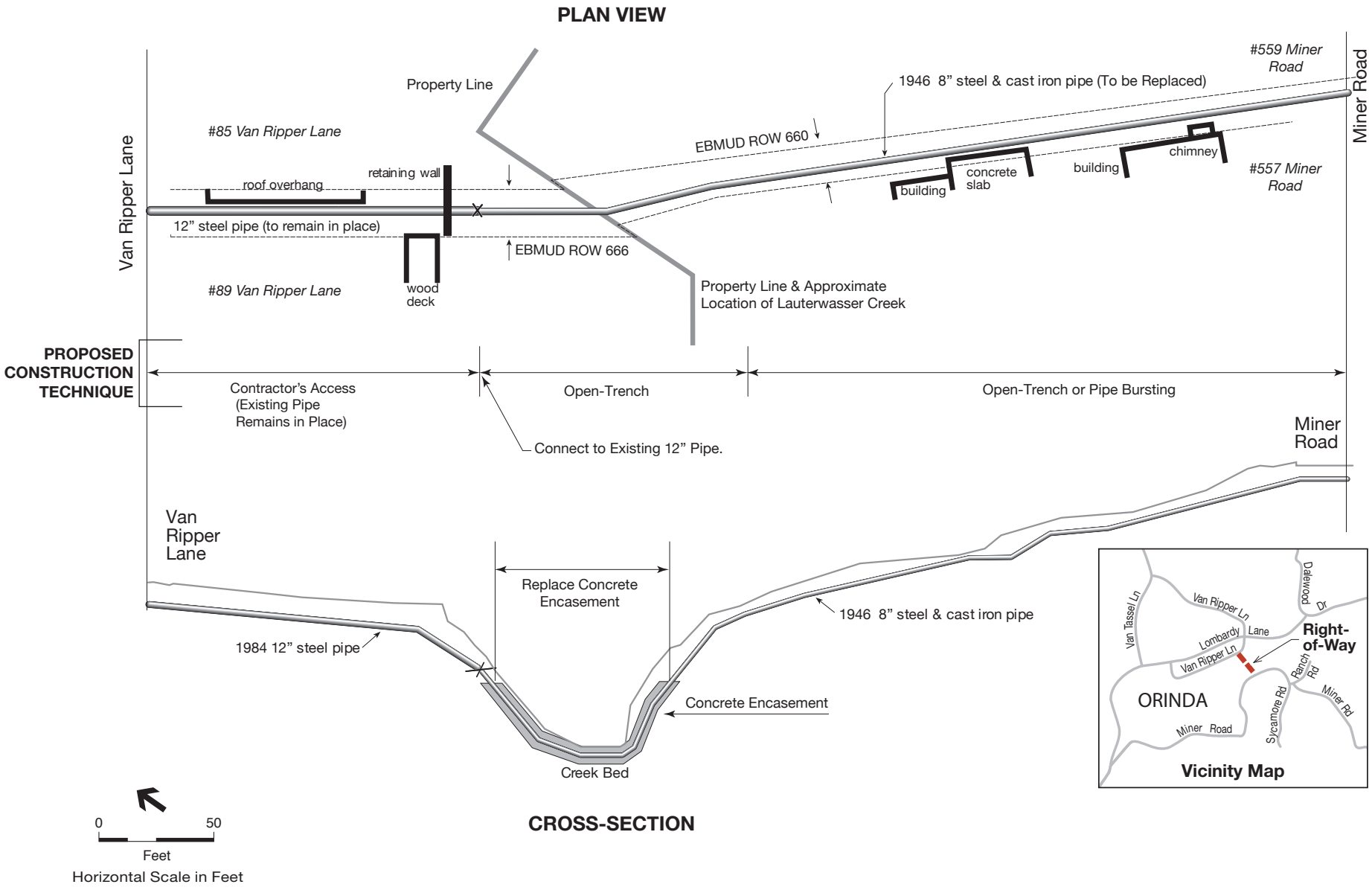
There has been no change in the need for and objectives of the Happy Valley Pipeline, described below.

2.2.1 Project Objectives

Table 2-1 identifies objectives of the WTTIP, including the Happy Valley Pipeline. The objectives most relevant for the Happy Valley Pipeline relate to reliability and operations. The following section (Section 2.2.2) identifies how the proposed project will meet relevant objectives.

TABLE 2-1
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 ▪ Meet fire flow objectives
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



SOURCE: EBMUD and ESA, 2010

Happy Valley Pipeline SEIR . 204369.02

Figure 2-3

Pipeline Alignment - ROW Segment (Miner Road to Van Ripper Lane)

2.2.2 Need for the Happy Valley Pumping Plant and Pipeline

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.

EBMUD's service area is divided into 122 pressure zones ranging in elevation from sea level to 1,450 feet. A pressure zone is an area within a specified elevation range (e.g., 250 to 450 feet) where storage and distribution facilities are designed to deliver water at a pressure range suitable for customer use. Coordination among facilities in different pressure zones is important for maintaining system operations. Generally, the pumping plant(s) in one pressure zone will pump water up to reservoirs in the next higher zone. Pumping plants in that higher pressure zone will in turn pump water up to higher zones. Reservoirs in higher zones may also provide water by gravity flow through regulators to lower-elevation pressure zones.

The proposed project addresses inadequacies in pumping and transmission capacity in the Las Aromas Pressure Zone (PZ). The Las Aromas PZ is located north of State Route 24 and east of Camino Pablo in Orinda and Lafayette. Four reservoirs and three pumping plants serve the 1,400 accounts in the Las Aromas PZ. The Las Aromas PZ also serves another 600 accounts outside of the zone supplied via pumping and regulation. The existing distribution system is made up of relatively small diameter pipelines, resulting in poor hydraulic connectivity between reservoirs. The current pumping capacity into the Las Aromas PZ is inadequate to meet both current and future maximum-day in-zone, above zone, and regulated demands. During hot summer days, the existing pumping plants need to operate continuously to maintain desired storage levels. The Happy Valley Pumping Plant project would provide an additional 3.2 mgd of pumping capacity needed to meet forecast maximum-day demand conditions in 2030 (the planning horizon for the WTTIP) and maintain storage in Happy Valley Reservoir. Construction of the Happy Valley Pumping Plant is scheduled to begin in 2014.

Need to Modify Pipeline Alignment

The need to modify the proposed pipeline alignment arose from an agreement between EBMUD and the City of Orinda executed after certification of the final WTTIP EIR in December 2006 in order to resolve issues raised by the City. As part of that agreement, EBMUD agreed to investigate options to minimize road closures during construction. After completing a detailed alternatives analysis, EBMUD determined that the proposed alignment in Miner Road would reduce traffic impacts relative to the WTTIP EIR alignment in Lombardy Lane. An additional benefit of the proposed alignment would be the replacement of an aging "backbone" pipeline. The segment of backbone pipeline that crosses Lauterwasser Creek is the only water supply connection between Happy Valley Reservoir and some residences in the vicinity of Miner Road. The backbone pipe segment across Lauterwasser Creek has a history of leaking and would require future replacement irrespective of the need to increase supply to the Happy Valley Reservoir.

2.3 Project Description

Section 2.3 is organized as follows to provide background on the Happy Valley Pipeline Project as a whole while distinguishing the proposed changes requiring additional environmental review:

2.3.1 WTTIP EIR Description of the Happy Valley Pipeline

- Design Characteristics
- Construction Characteristics
- Operations and Maintenance

2.3.2 Proposed Changes to the Happy Valley Pipeline Analyzed in the SEIR

- Design Characteristics
- Construction Characteristics
- Operations and Maintenance

2.3.1 WTTIP EIR Description of the Happy Valley Pipeline

Design Characteristics

Figure 2-1 shows the Happy Valley Pipeline alignment identified in the WTTIP EIR. The WTTIP EIR identifies an approximately 5,300-foot-long, 16-inch-diameter, welded-steel pipe that would be constructed between the Miner Road/Oak Arbor Road intersection and the proposed pumping plant[1] location along Lombardy Lane near Van Ripper Lane. An additional short segment of 12-inch-diameter pipeline would be constructed between the future Happy Valley Pumping Plant and an existing pipeline in Lombardy Lane.

Construction Characteristics

Methods

The WTTIP EIR identifies that the pipeline would be constructed using the open-trench (or "cut and cover") technique, which involves the following:

- Sawcutting the pavement
- Excavating a trench
- Removing the soils
- Installing the pipeline
- Backfilling the trench
- Repaving

Equipment

The WTTIP EIR identified the following construction equipment for pipeline installation: pavement saws, jack hammers, excavators, backhoes, dump trucks, front-end loaders, forklifts, flatbed delivery trucks, paving equipment (asphalt and/or concrete trucks, rollers), water trucks, and vibratory compactors.

[1] The EBMUD Board of Directors adopted the alternative pumping plant site analyzed in the WTTIP Final EIR (on Miner Road at Camino Sobrante, FEIR p. 3.4-1 *et seq*) in lieu of the proposed location identified in the WTTIP Draft EIR (on Lombardy Lane near Van Ripper Lane, DEIR p. 2-2-74 *et seq*).

Construction Staging

Staging areas would be accommodated adjacent to or in vicinity of the pipeline corridors wherever feasible, at the Happy Valley Pumping Plant site, and potentially at the Orinda Water Treatment Plant (located on Camino Pablo north of Miner Road).

Construction Schedule, Duration, and Hours of Construction

For the construction of the Happy Valley Pipeline, the WTTIP EIR assumed a construction start date of May 2011 with an estimated duration of 1-2 years. The WTTIP EIR assumed standard work hours of 7:00 a.m. to 6:00 p.m., with construction in roadways occurring from 8:30 a.m. to 4:30 p.m. **Table 2-2** provides construction duration and details (vehicle trips) for specific pipeline segments.

Road Closure

The WTTIP EIR identified that construction of the Happy Valley Pipeline would require full road closure of Miner Road (from Oak Arbor Road to Lombardy Lane) and Lombardy Lane (from Miner Road to Van Ripper Lane).

2.3.2 Proposed Changes to the Happy Valley Pipeline Analyzed in this SEIR

Design Characteristics

As described above, Phase I of the pipeline was completed in 2009 and included construction of 1,400 feet of new 16-inch pipe, extending from the Miner Road/Oak Arbor Lane intersection to the Miner Road/Lombardy Lane intersection. For Phase II, instead of installing the pipeline along Lombardy Lane, the proposed 16-inch pipeline would be installed along Miner Road as shown in Figure 2-2. The proposed route encompasses a total length of 4,600 feet of which 3,300 feet consists of new pipeline construction and 1,300 feet consists of existing pipeline. The 3,300 feet of new pipeline would be installed in three segments: the Miner Road segment, the District ROW segment, and the Van Ripper Lane segment.

The Miner Road segment is approximately 2,500 feet long, starts at the Miner Road/Lombardy Lane intersection, and ends at the intersection of Miner Road/Tiger Tail Court where the pipeline would then tie into an existing 12-inch pipe.

The ROW segment follows two existing District ROWs (660 and 666) between Miner Road and Van Ripper Lane and crosses a ravine and Lauterwasser Creek. The ROW is approximately 500 feet long and 10 feet wide. The proposed 350 feet of new pipeline would tie into an existing 12-inch pipeline on the northern slope of the creek bank (south of) between the residences at 85 and 89 Van Ripper Lane.

The Van Ripper Lane segment is approximately 450 feet in length and follows Van Ripper Lane northeast to Lombardy Lane.

TABLE 2-2
TRIP GENERATION ESTIMATE –HAPPY VALLEY PIPELINE ALIGNMENT ANALYZED IN THE WTTIP EIR

Construction Phase	Pipe length (feet)	Pipe diameter (inches)	Approx. Duration (weeks)	Haul Trucks (per day)	Materials Trucks (per day)	Worker Vehicles (per day)	One-Way Trips (per day)	Max. One-Way Trips Per Hour	
*Miner Rd.	1,400	16	3.5	7	4	13	49	3	Trucks
(Oak Arbor to Lombardy Ln)								13	Vehicles
Lombardy Ln	650	16	1.6	7	4	13	49	3	Trucks
(Miner Rd. to Sleepy Hollow Ln)								13	Vehicles
Lombardy Ln	3,225	16	8.1	7	4	13	49	3	Trucks
(Sleepy Hollow to Van Ripper Ln.)								13	Vehicles
*Lombardy Ln	500	16	1.3	7	4	13	49	3	Trucks
(Van Ripper Ln - Proposed Happy Valley PP)								13	Vehicles
Total	5,775								
						MAXIMUM ONE-WAY TRIPS PER DAY =	**49**		
Total excavated material (CY) = 2,657						**MAXIMUM ONE-WAY TRIPS PER HOUR =**		**3**	**Trucks**
								13	**Vehicles**

NOTES: * The Miner Road segment from Oak Arbor Road to Lombardy Lane was completed during Phase I. The Lombardy Lane segment is no longer proposed due to the relocation of the proposed pumping plant from Lombardy Lane near Van Ripper Lane to Miner Road near Camino Sobrante.

Assumptions:

1. Trench width of 2.5 feet and trench depth of 5 feet.
2. Haul trucks include trench pavement and soil disposal as well as fill import deliveries. Haul truck average 9 cubic yards per load.
3. Per lineal foot: 0.46 CY of pavement and trench spoils will be hauled off-site and 0.38 CY of new fill will be imported.
4. Material trucks trips per day include deliveries for: pipeline (1), appurtenance (1), paving (1) and equipment delivery (1).
5. Worker vehicles consist (9) vehicles for crew, (1) contractor superintendent, (1) district inspector, (1) city inspector, (1) visitors.
6. The contractor would be able to install an average of about 80 feet of pipe each work day in paved areas.
7. Excavated soil to be hauled off site and replaced by aggregate base in the street. In unpaved areas the soil will be stockpiled and replaced.
8. Work schedule M-F 8:30 am to 4:30 pm.
9. One construction site along the alignment.
10. Doesn't show down time nor reflect total duration

Construction Characteristics

Construction Methods in Roadways

During the construction of Phase I, Miner Road was closed to through traffic between the hours of 9:00 a.m. to 9:00 p.m. to allow open trench installation of the pipeline. A similar schedule is planned for open trench installation in Miner Road under Phase II.

Within Miner Road and Van Ripper Lane, the open-trench technique described above in Section 2.3.1 would be used. During construction, affected roadway segments would be closed to through traffic except for emergency vehicles, garbage collection service, and U.S. Postal Service). Access to homes in this section of roadway would be accommodated as well. Outside of work hours, the work areas would be covered and vehicle access would be restored. Only roadway segments under construction would be closed. Once construction of a segment is completed, access to that segment would be restored. After the entire pipeline is constructed and tested, the affected portions of the roadway will be paved. Some trimming of overhanging trees may be necessary along the roadways; however, no trees along Miner Road and Van Ripper Lane would need to be removed. No modifications are proposed to the type of construction equipment that was identified in the WTTIP EIR (identified in Section 2.3.1 above).

Traffic Control Plan

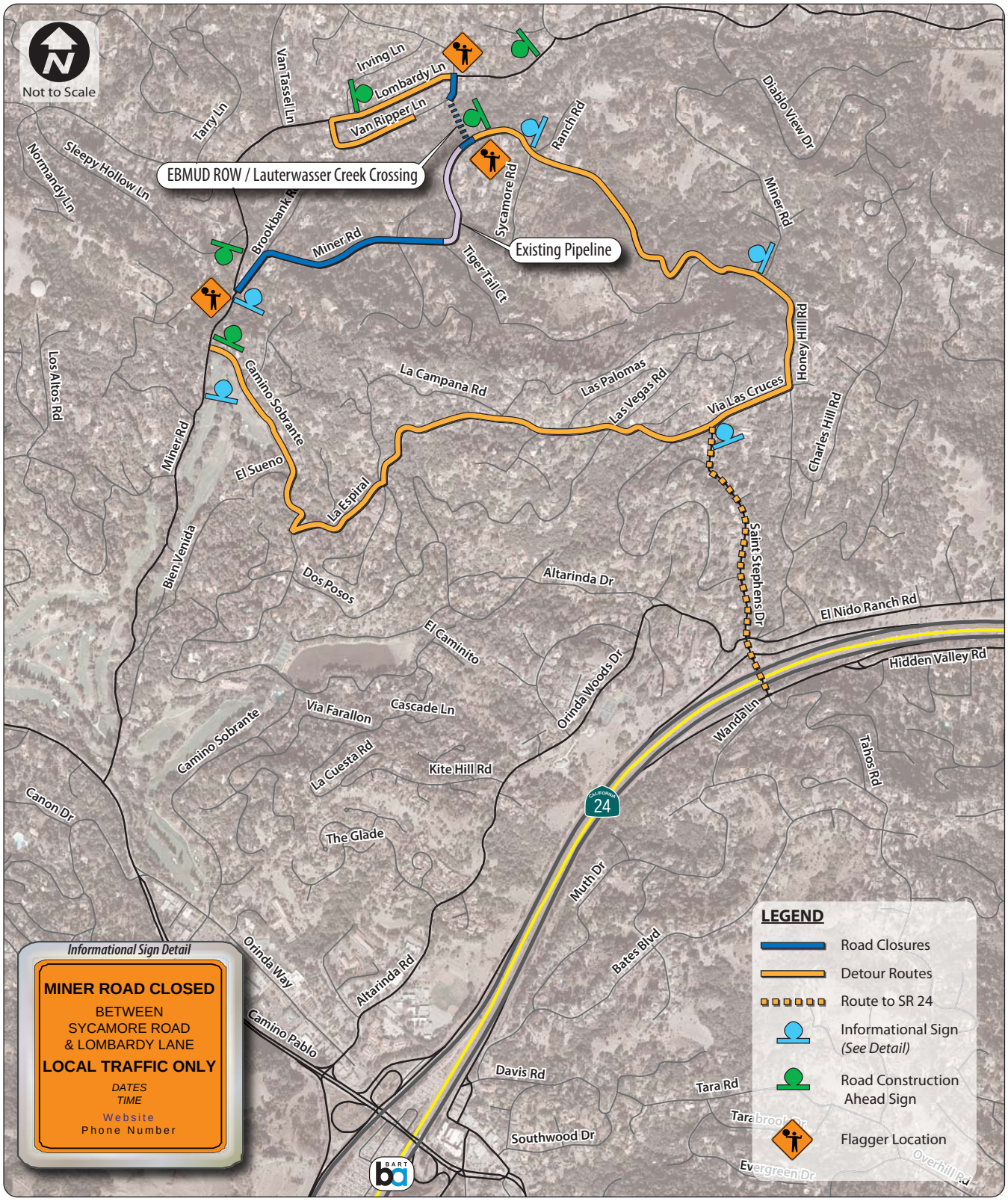
As part of this SEIR, a preliminary traffic control plan was prepared and is illustrated in **Figure 2-4**. As shown, detour routes are available for traffic using Miner Road. Local traffic would be able to use Camino Sobrante to La Espiral Road to Via Las Cruces and then to Honey Hill Road, which becomes Miner Road. This detour is up to 2.5 miles long depending on driver's destination and location of the closure. For access to and from State Route 24, drivers may also use Saint Stephens Drive.

The District would prepare a detailed Traffic Control Plan during final design of the pipeline. The Traffic Control Plan would identify the following:

- Circulation and detour plans
- Location of road closure points and turn-around points
- Specific measures for controlling traffic on detour routes (e.g. flaggers, signage)

Construction Methods in ROWs

EBMUD holds two right-of-ways (ROWs) between Miner Road and Van Ripper Lane. These ROWs were acquired in 1946 for the purpose of operating and maintaining the installed pipeline. Both ROWs are narrow (approximately 10 feet in width), cross steep terrain at Lauterwasser Creek, and are adjacent to existing homes. Due to the limitations of space and the terrain, equipment used in the ROWs would be limited. In general, the existing pipeline in these two ROWs would be replaced using a combination of pipe bursting and/or open-trench excavation. Backhoes and excavators may be used in the portion of the ROW near Miner Road; however, work in the majority of the ROWs is expected to be completed by a mini-excavator/loader (e.g. Bobcat) and/or by hand (including the use of jackhammers, plate compactors and other portable equipment.



SOURCE: Fehr & Peers, 2010

Happy Valley Pipeline SEIR . 204369.02

Figure 2-4
Preliminary Traffic Control Plan

Pipe bursting (described in **Figure 2-5**) may be used where appropriate to minimize disruption and to facilitate construction. Open trench excavation would be necessary near 557 Miner Road to protect the home from ground vibration and soil movement. Open trenching would also be required in other areas to avoid or reduce soil heaving and to protect utilities. Trees and shrubs located within the corridor would need to be removed to provide access. At the end of construction, shrubs and bushes would be restored; however trees would not be replaced within the District ROWs as they have the potential to damage pipelines and make periodic maintenance very difficult. Any trees considered protected under the City of Orinda's Tree Ordinance that require removal would be replaced if feasible and prudent (refer to Section 3.2.5, Biological Resources, for further discussion).

At Lauterwasser Creek, the existing pipeline is encased in concrete. The existing pipeline and encasement would be removed, the trench widened, and the larger replacement pipeline and new encasement installed. Excavation in the creek and creek banks is expected to be done primarily using hand-operated equipment including jackhammers, shovels, and other small and portable equipment. All excavated material would be hauled to Miner Road or Van Ripper Lane and trucked off-site.

Lauterwasser Creek is a perennial stream and while flows during summer months are low, the creek flow would need to be bypassed to allow construction in the creek bed. Temporarily during construction, the creek would be dammed with sand bags along the upstream edge of the ROW and directed into a bypass pipe to convey flows around and downstream of the excavation area. Any water that seeps into the excavated trench in the creek bed would be pumped to tanks for treatment and testing before either returning to the creek or appropriate disposal. Sand bags would be constructed along the downstream edge of the ROW to ensure that any excavated material is not discharged into the creek. The new pipeline would also be encased in concrete, matching the grade and shape of the surrounding creek bed. The creek banks will be restored and stabilized to prevent erosion and ensure slope stability.

Construction Staging

Construction staging (temporary storage of construction material and equipment) would occur along Van Ripper Lane and in turnouts on Miner Road and Lombardy Lane. Staging areas would be located to maintain traffic access and minimize safety hazards.

Construction Schedule, Duration and Hours of Construction

Phase I of the pipeline was completed in 2009 while Phase II is scheduled to be completed in the summer of 2013 over a two to three month period.

Table 2-3 identifies the construction work and road closure hours. **Table 2-4** provides construction duration and details (trip generation) for specific pipeline segments.

Figure 2-5
Pipe Bursting Technique

Pipe Bursting Technique

Pipe Bursting is a form of trenchless pipeline construction by which a new pipeline is inserted into the enlarged space of an existing pipeline without trenching. The existing pipeline is burst by a conically shaped tool (bursting head) that breaks apart the existing pipe and pushes pipe fragments and surrounding soil outwards to provide space for the new pipeline. The new pipeline is attached to the bursting head, and is installed into the resulting void as the bursting head advances. The bursting head and pipe are fed from an insertion pit and pulled from a reception pit.

There are three general types of pipe bursting: pneumatic, hydraulic and static. In pneumatic pipe bursting, an impact hammer within the bursting head forces it forward. The pneumatic head is driven by compressed air supplied by an air hose feed through the insertion pit to a generator. With a hydraulic system, the bursting head has an expanding segment which is operated by a pneumatic piston. As the head is pulled through the old pipe, interlocking segments expand and contract, forcing the pipe apart laterally. In static pull pipe bursting, the bursting head has no internal moving components; the force to split the pipe is provided only from the pulling the head through the old pipe. Static pull bursting heads typically have cutting wheels or blades that fracture the old pipe. The static pull system is generally done with a segmented rod assembly which is capable of supplying more tension than a cable. In this case, a hydraulic puller is placed in the reception pit and draws the rod through the old pipe

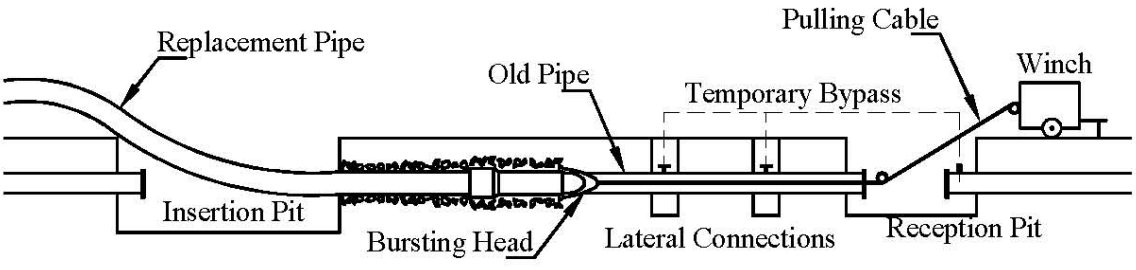
Construction Considerations

Pipe bursting operates by breaking apart an existing pipe and compressing the surrounding soil. As a result, this process generates ground displacement and vibration that can damage adjacent pipelines, utilities and structures. Ground vibration diminishes significantly within a short distance; as a result, only utilities or structures that are located directly adjacent to the pipeline replacement have the potential to be affected. Where other utilities or structures are close to the pipeline that is being replaced, the adjacent utilities are located to determine the exact distance from the replacement pipeline. If necessary, the ground around the utilities and structures is excavated prior to bursting. This effectively eliminates soil movement and vibration by eliminating contact with the surrounding ground. Soil heaving to soils can also occur if the pipeline is located near the surface. The amount of soil heaving depends on the depth of the pipeline, the degree of upsizing (whether the new pipeline is substantially larger than the old pipeline), and the type and compaction of the soil. Whether or not soil heaving is relevant depends on the proximity of roads, structures, and other utilities. Excavation of insertion and reception pits is required for the process.

Equipment

Typical construction equipment associated with pipe bursting include generators, winches, excavators, backhoes, dump trucks, front-end loaders, flatbed delivery trucks, pavement saws, jack hammers, and vibratory compactors.

Typical Pipe Bursting Construction



SOURCE: USACE, 2001.

TABLE 2-3
EXPECTED CONSTRUCTION WORK HOURS

Activity	Days	Hours
Construction of pipelines in public roadways (road closure)	Monday through Friday[a]	9:00 a.m. to 9:00 p.m.[b]
Construction of pipelines in ROWs[c]	Monday through Friday[c]	8:00 a.m. to 6:00 p.m.

[a] Occasional weekend work would be needed for some construction activities (e.g., system connections to maintain water service).
[b] Same construction hours for Phase I.
[c] For some construction activities such as dewatering, some pieces of equipment (e.g., pumps and generators) would be required to operate 24 hours per day.

2.4 Intended Uses of the SEIR

As the lead agency, EBMUD will be required to certify the Final SEIR for the project in accordance with the requirements of CEQA, as amended. This will include the selection of a preferred alternative based on the findings of the environmental analysis and other information in the administrative record.

Other anticipated approvals that may be required for the project, as well as those regulatory agencies that may rely on the SEIR for consideration, are identified below. The list includes the federal, state, local, and other permits/approvals that would be required for construction of the proposed project.

- Regional Water Quality Control Board Section 401 Water Quality Certification/Waste Discharge Requirement
- U.S. Army Corps of Engineers Section 404 Permit
- Consultation with the U.S. Fish and Wildlife Service for Endangered Species Act Section 7
- Consultation with State Office of Historic Preservation for National Historic Preservation Act Section 106
- California Department of Fish and Game for Streambed Alteration Agreement
- Encroachment Permit from the City of Orinda.

TABLE 2-4
TRIP GENERATION ESTIMATE – HAPPY VALLEY PIPELINE ALIGNMENT ANALYZED IN THIS SEIR

Construction Phase	Pipe length (feet)	Pipe diameter (inches)	Production Rate (ft/day)	Approx. Duration (weeks)	Haul Trucks (per day)	Materials Trucks (per day)	Worker Vehicles (per day)	One-Way Trips (per day)	Max. One-Way Trips Per Hour	
Miner Road	2,500	16	80	6.3	7	4	13	49	3	Trucks
(Lombardy Ln to Tiger Tail Court)									13	Vehicles
R/W 660 and R/W 666	350	16	20	(3.5)	2	4	13	38	1	Trucks
(Miner Rd to Van Ripper Ln)									13	Vehicles
Van Ripper Lane	450	16	80	1.1	7	4	13	49	3	
(R/W 666 to Lombardy Ln)									13	
Total	3,300			7.4						
					MAXIMUM ONE-WAY TRIPS PER DAY =			**49**		
Total excavated material (CY) = 1,518					**MAXIMUM ONE-WAY TRIPS PER HOUR =**				**3**	**Trucks**
									13	**Vehicles**

Assumptions:

1. Trench width of 2.5 feet and trench depth of 5 feet.
2. Haul trucks include trench pavement and soil disposal as well as fill import deliveries. Haul truck average 9 cubic yards per load.
3. Per lineal foot: 0.46 CY of pavement and trench spoils will be hauled off-site and 0.38 CY of new fill will be imported.
4. Material trucks trips per day include deliveries for: pipeline (1), appurtenance (1), paving (1) and equipment delivery (1).
5. Worker vehicles consist (9) vehicles for crew, (1) contractor superintendent, (1) district inspector, (1) city inspector, (1) visitors.
6. Excavated soil to be hauled off site and replaced by aggregate base in the street. In unpaved areas the soil will be stockpiled and replaced.
7. Work schedule: in public roadways M-F 9:00 am to 9:00 pm; in ROWs M-F 8:00 am to 6:00 pm
8. One construction site along the alignment.
9. Doesn't show down time nor reflect total duration
10. Construction of the District ROW segments would occur concurrently with Miner Road segment.

CHAPTER 3.0
Environmental Setting, Impacts, and Mitigation Measures

This chapter contains the following sections:

3.1 Introduction

The proposed changes to the Happy Valley Pipeline project warrant reevaluation of several environmental topics addressed in the WTTIP EIR, including Land Use, Planning, and Recreation; Visual Quality; Geology, Soils, and Seismicity; Hydrology and Water Quality; Biological Resources; Cultural Resources; Traffic and Circulation; Air Quality; and Noise and Vibration. In addition, Greenhouse Gases are also addressed to reflect the amendments to Appendix G of the CEQA Guidelines (Office of Planning and Research [OPR], 2010). These issues are addressed in Section 3.2. For each of these topics, the environmental setting, thresholds of significance, impact analysis, and mitigation measures are discussed. The WTTIP EIR was used as a basis for information about the setting of the project site and surrounding area, and for thresholds for determining impact significance. The impact analyses focus on the potential for the proposed changes to the Happy Valley Pipeline project to result in new significant impacts, or to cause impacts disclosed in the WTTIP EIR to worsen.

For consistency, the same alphanumeric identifiers for impacts and mitigation measures in the WTTIP EIR are also used in this SEIR. For example, the first impact in Land Use, Planning and Recreation in the WTTIP EIR (3.2-1, Division of a Community) has the same number in this SEIR. New or revised measures included in this SEIR include the tag HVPL after their number. All mitigation measures identified in the WTTIP EIR that are applicable to the proposed project, along with the new or revised measures identified in this SEIR are incorporated in the Mitigation Monitoring and Reporting Plan drafted for the proposed project (Appendix A).

Based on elements of the project described in Chapter 2 and the previously performed environmental impact review, no changes are expected with respect to the significance or severity of impacts in the following areas: Hazards and Hazardous Materials, Public Services and Utilities. These resources areas are briefly discussed in Section 3.3 of this SEIR.

3.2 Environmental Issues Considered in Detail

3.2.1 Land Use, Planning, and Recreation

Existing Land Use and Planning Designations

Land uses surrounding the project area consist of single family residential. Sleepy Hollow Elementary School is over 0.5 mile away from the project area. There are no agricultural resources within the immediate vicinity of the project area. The nearest recreational resource is the Orinda Country Club Golf Course which is located adjacent to one of the project staging areas (Camino Sobrante and Miner Road intersection) and approximately 0.1 mile south of the proposed pipeline's southern terminus.

Plans and Policies

Consistency between the Happy Valley Pipeline and general plans and other plans was discussed in the WTTIP EIR in accordance with CEQA Guidelines Section 15125(d). Appendix D of the WTTIP EIR summarizes the content of general plans for land use planning agencies in the area. Appendix B of this SEIR summarizes applicable goals and policies contained in the City of Orinda's General Plan. It is EBMUD's practice to work closely with host jurisdictions and the neighboring community during project planning and to conform to local land use plans and policies to the extent possible. However, actual determinations of project consistency with general plans would be made by the pertinent land use jurisdictions consistent with California Government Code Section 65402(b).

Below is a summary of plans and policies that were addressed in the WTTIP EIR (see WTTIP EIR pp. 3.2-12 to 3.2-13) and which also apply to the proposed project. Overall, implementation of the proposed project appears to be consistent with general and regional plans. The proposed project would facilitate local jurisdictions' ability to achieve general plan goals and policies related to providing a high-quality water supply and addressing capacity deficiencies. Improvements to address existing capacity deficiencies and to meet projected increases in demand would benefit customers in the project area by ensuring that supplies continue to meet demand.

Implementation of the proposed project would result in potential inconsistencies with the City of Orinda's General Plan related to tree removal and the temporary closure of public roadways and emergency access routes. However, potential inconsistencies related to temporary road closures would be short term (i.e., would occur during construction only). As noted in Chapter 2, Description of the Proposed Project, emergency access would be maintained throughout the construction period. Tree removal activities would result in conflicts with tree removal policies and conflicts with some policies related to views and scenic resources.

The changes to the proposed project in this SEIR would not change the conclusions from the WTTIP EIR, above. Inconsistency with tree policies would not change due to project changes. Section 3.2.2, Visual Resources, addresses visual impacts and mitigation measures associated with tree removal. In addition, Section 3.2.5, Biological Resources, describes the Happy Valley

Pipeline project's consistency with the City of Orinda's tree protection policy. As discussed in Section 3.2.9, Noise and Vibration, below, both open-trench and pipe bursting construction activities could exceed noise City of Orinda noise limits and would be inconsistent with hours allowed in the City of Orinda Noise Ordinance if construction persists until 9:00 p.m.

Impacts and Mitigation Measures

Significance Criteria

Consistent with the WTTIP EIR, the proposed project would result in a significant impact if it would:

- Physically divide an established community;
- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance;
- Conflict with existing zoning for agricultural use or a Williamson Act contract;
- Involve other changes that could result in conversion of farmland to nonagricultural use;
- Increase the use of existing parks or recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; or
- Include recreational facilities or require construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

Methodology

Based on the analysis provided in the 2006 WTTIP EIR, and in light of the project changes, the following impacts would not change and are not discussed further for the following reasons:

- *Impact 3.2-2: Agricultural resources impacts.* As discussed in Section 3.2 of the WTTIP EIR, the Happy Valley Pipeline project is located in an area designated as Urban and Build-up Lands, according to the California Department of Conservation's Important Farmland Maps for Contra Costa County. With the revised pipeline alignment, the proposed project would still occur on Urban and Build-up Lands. Therefore, as determined in the WTTIP EIR, construction of the Happy Valley Pipeline would not result in an agricultural resources impact.

- *Impact 3.2-3: Recreation resources impacts.* As described in Section 3.2 of the WTTIP EIR, construction of the southernmost segment of the Happy Valley Pipeline in Miner Road would pass along the western side of the northern portion of the Orinda Country Club Golf Course. Project staging areas would be located at the pumping plant site near the Miner Road and Camino Sobrante intersection and in turnouts along Miner Road and Van Ripper Lane. The WTTIP EIR determined that construction of this segment would result in noise, dust, construction traffic, and access disruption throughout the construction period. Since construction of the southernmost portion of the pipeline was completed in 2009 as part of Phase I of the proposed project, construction of the remaining portion of the pipeline would result in less severe recreational impacts on the Orinda Country Club Golf Course in comparison to those described in the WTTIP EIR. The proposed project changes would not

result in substantial deterioration of recreational facilities or require construction new recreational facilities. For these reasons, impacts on recreational resources would remain less than significant.

Effects to the analysis provided in the WTTIP EIR in the Land Use, Planning, and Recreation section are limited to WTTIP EIR Impact 3.2-1, described below.

Impacts and Mitigation Measures

Impact 3.2-1: Division of an established community.

Construction of the Happy Valley Pipeline includes three defined phases: a 2,500-foot segment following Miner Road from Lombardy Lane to Tiger Tail Court; a 350-foot cross-country segment that follows two District ROWs and crosses a ravine and Lauterwasser Creek; and a 450-foot long segment that follows Van Ripper Lane northeast to Lombardy Lane. Approximately 40 residences are located directly adjacent to these pipeline segments. Throughout the project area, temporary disruption of adjacent land uses (residential) could result from a combination of direct impacts related to noise, vibration, dust, traffic congestion, and/or access disruption. Each of these potential direct impacts is evaluated separately in the following sections: 3.2.7, Traffic and Circulation; 3.2.8, Air Quality; and 3.2.9, Noise.

As described in Section 3.2.7, construction of the portions of the Happy Valley Pipeline on Miner Road (between Lombardy Lane and Tiger Tail Court), and Van Ripper Lane (between Lombardy Lane and the point where the District's right-of-way intersects between 85 and 89 Van Ripper Lane) would require full road closure during construction work hours of 9:00 a.m. and 9:00 p.m. on weekdays. For construction of the cross-country pipeline segment, construction staging would occur along Van Ripper Lane and in turnouts on Miner Road and Lombardy Lane. Although access to the closed portions of Miner Road and Van Ripper Lane would be maintained for residents during construction hours, this road would be temporarily closed to other motorists. Since construction would occur during the summer season and would require approximately two to three months, project construction is not anticipated to disrupt access to Sleepy Hollow Elementary School which is located approximately 0.5 mile away from the proposed alignment.

Construction noise levels would vary depending on the construction phase and associated activities, the distance from the proposed construction and staging areas to noise-sensitive land uses, and the equipment being used. The closest residences on Miner Road are approximately 25 feet from the in-street portions of the alignment and are directly adjacent to the cross-country segment. Most residences are located approximately 40 feet or more from the pipeline alignment on Miner Road. Residences would periodically experience construction-related noise levels exceeding speech interference thresholds, indicating that construction noise could affect existing daytime activities such as watching television and outdoor gardening. Refer to Section 3.2.9, Noise and Vibration, for a more detailed discussion of physical impacts due to construction-related noise disturbance in the project area.

Construction activities would generate fugitive dust, the physical effects of which could indirectly affect nearby residential land use activities. Construction equipment and traffic near the project site would also generate exhaust emissions, which could affect nearby land uses. Refer to Section 3.2.10, Air Quality, for a more detailed discussion of construction emissions of fugitive dust and engine exhaust.

The combination of direct impacts related to construction-related detours and traffic congestion throughout the two to three month construction period, noise levels exceeding speech interference thresholds, and increases in dust and exhaust emissions could substantially disrupt nearby residential land uses. Implementation of Measures 3.8-1-HVPL, 3.9-1-HVPL, and 3.10-1a-HVPL (described in Sections 3.2.7, 3.2.8, and 3.2.9, respectively) would address the direct traffic, air quality, and noise impacts, respectively, of construction activities at nearby land uses. However, even with implementation of these measures, the combined, residual effects of the traffic, noise, and air quality impacts would be considered a potentially significant impact due to the overall disruption to adjacent residences, particularly those directly adjacent to the cross-country segment of the alignment (within 25 feet). This impact would be reduced to a less-than-significant level through implementation of Measure 3.2-1-HVPL which would require the District to provide advance notification to all residences in the project area regarding the construction location, schedule, nature of activities, and detours, as well as provide suggestions for avoiding traffic delays and reducing the effects of construction-related noise and air emissions.

Mitigation Measure

To reduce identified significant construction-related land use impacts to a less-than-significant level, Measure 3.2-1-HVPL, adopted as a condition of project approval and presented in Appendix A of this SEIR, will be required for the proposed project.

> **Measure 3.2-1-HVPL:** The District or its contractor shall provide 14-day advance notice by mail to all facilities, tenants, and property owners in the project area. The notice will also be posted near the project site. The notice shall state the construction location, nature of activities, and schedule. The notice shall indicate alternative traffic and bicycle routes and provide suggestions for avoiding traffic delays and reducing the effects of construction-related noise as well as dust and exhaust emissions (e.g., planning alternative schedules, closing windows facing the planned construction sites).
>
> The District shall identify and provide a public liaison officer before and during construction to respond to the concerns of nearby residences, recreationists, and other potentially affected land uses. Procedures for contacting the public liaison officer via telephone, email, or in person shall be included in the notices. Prior to construction, the District public liaison officer, resident engineer, and construction manager shall develop procedures for receiving and responding to questions and complaints.

3.2.2 Visual Quality

Environmental Setting

Visual Character of the Project Area

The Happy Valley Pipeline alignment is situated within an established single-family residential area. Both sides of Miner Road consist of dense roadside vegetation, including mature trees and residential landscaping. Photos 1, 2, and 3 on **Figure 3.2-1**, taken from different viewpoints on Miner Road, show the visual character along this segment of the Happy Valley Pipeline alignment. Photo 3 shows trees lining 559 Miner Road which is located at the southeastern end of the cross-country pipeline segment. Photo 4 on Figure 3.2-1 shows the density of trees behind 85 and 89 Van Ripper Lane, the terminus of the cross-country pipeline segment.

Impacts and Mitigation Measures

Significance Criteria

Consistent with the WTTIP EIR, the proposed project would result in a significant impact if it would:

- Substantially degrade the existing visual character or quality of the site and its surroundings;
- Substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway;
- Have a substantial, adverse effect on a scenic vista; or
- Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

Methodology

Based on current changes to the proposed project, this analysis determined that the following potential visual impact identified in the WTTIP EIR would not change for the proposed project:

- *Impact 3.3-1: Short-term visual effects experienced from nearby areas during project construction.* The WTTIP EIR determined that construction activities associated with the Happy Valley Pipeline would be highly noticeable to land uses adjacent to the project site for short periods of time, approximately two weeks (within an overall construction schedule of three and a half months). Construction would be longer at the District's ROWs for up to one month (within an overall construction schedule of two to three months). Construction staging would be visible along Van Ripper Lane and in turnouts on Miner Road and Lombardy Lane. While the duration of construction at specific homes along the alignment would be longer than what was anticipated in the WTTIP EIR, potential visual impacts due to pipeline construction activities would remain less than significant due to the limited duration of construction.

Miner Road

1. Looking northeast from Miner Road and Lombardy Lane intersection.

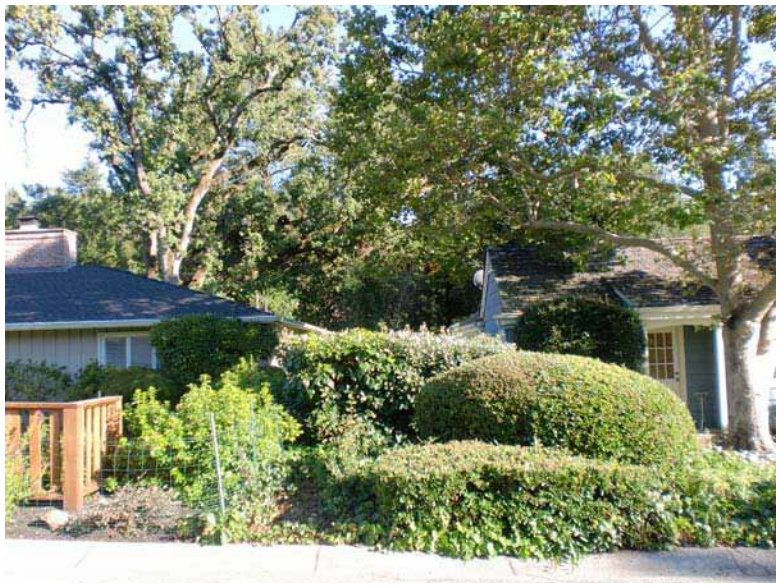
Miner Road

2. Looking south from Miner Road (near Tiger Tail Court intersection).

EBMUD ROW

3. Looking west from Miner Road (near 559 Miner Road). Orange lines (above) indicate trees that would likely require removal due to project construction.

EBMUD ROW



4. Looking southeast from 85 and 89 Van Ripper Lane.

SOURCE: ESA, 2010

Figure 3.2-1
Happy Valley Pipeline Site and Surroundings

Proposed changes in the pipeline alignment would, however, result in visual impacts related to construction work at Lauterwasster Creek and tree removal activities. This analysis focuses on the WTTIP EIR Impact 3.3-2, alteration of the appearance of WTTIP sites, Impact 3.3-3, effects on views from the surrounding area, including residential areas, and Impact 3.3-4, effects on a scenic vista, which are described below. In addition, this analysis addresses WTTIP EIR Impact 3.3-5, new sources of light and glare.

Impacts and Mitigation Measures

Impact 3.3-2: Alteration of the appearance of WTTIP sites.

Although the Happy Valley Pipeline would be buried in roadways and beneath Lauterwasser Creek, the revised alignment would entail greater tree disturbance than what was estimated in the WTTIP EIR. As shown in Figure 2-2 in Chapter 2 pipeline installation activities would require some tree trimming along Miner Road and would likely require trimming and removal of trees located within the District's ROWs between Miner Road and Van Ripper Lane. Within the vicinity of the ROWs, approximately 15 to 35 trees would require removal and approximately 15 to 35 trees would require trimming. Most of the trees proposed for removal are located in the District ROWs and would not be noticeable from Miner Road and Van Ripper Lane due to the presence of dense vegetation and homes in the immediate vicinity. However, the removal of some mature trees lining the northern side of Miner Road (see Photo 3 in Figure 3.2-1) would substantially alter the appearance of the project site. Therefore, removal of these trees would significantly alter the appearance of this particular pipeline segment. Implementation of WTTIP EIR Measure 3.3-2b and Measures 3.6-1a through 3.6-1d (presented in Appendix A) would require restoration of the disturbed areas. With implementation of these measures, the impact related to the alteration of the appearance of the project site would be less than significant.

Impact 3.3-3: Effects on views from the surrounding area, including pubic roadways, public trails, and open space and residential areas.

As described above, implementation of the revised alignment would result in greater tree disturbance than the original alignment, which would affect views from the surrounding area. Because trees are generally considered to be aesthetically pleasing, tree removal within the District's ROWs would result in adverse effects on residential views from Miner Road and from Van Ripper Lane. However, as described under Impact 3.3-2, the effect on public views would not be as substantial. Tree trimming and removal activities would be most noticeable near 557 and 559 Miner Road (see Photo 3 in Figure 3.2-1). Since the tree removal area is surrounded by dense stands of mature trees, nearby residents and motorists traveling on Miner Road would still have views of other mature trees and vegetation in the immediate vicinity. In addition, implementation of WTTIP EIR Measure 3.3-2b and Measures 3.6-1a through 3.6-1d (presented in Appendix A) would require restoration of the disturbed areas. Therefore, with implementation of Measure 3.3-2b and Measures 3.6-1a through 3.6-1d, the effect on views from the project's surrounding area is considered less than significant.

Impact 3.3-4: Effects on a scenic vista.

As determined in the WTTIP EIR, installation of the Happy Valley Pipeline would occur belowground and would not be visible from a scenic vista. However, with the proposed changes, the pipeline segment that crosses Lauterwasser Creek would require tree removal activities within the District ROWs. Since both Lauterwasser Creek and trees are considered scenic resources, construction activities within the District ROWs would be potentially significant. Views of the affected area would be very limited due to the lack of public access, terrain (steep slopes) surrounding the creek, and the lot size in the project vicinity. As described under Impacts 3.3-2 and 3.3-3, implementation of WTTIP EIR Measure 3.3-2b and Measures 3.6-1a through 3.6-1d (presented in Appendix A), would require restoration of the disturbed areas, and would thereby reduce effects on scenic resources. Therefore, since construction would be temporary, because views would be limited to adjacent residents, and with implementation of the measures described above, impacts on scenic resources would be less than significant.

Impact 3.3-5: New sources of light and glare.

With the project changes, construction work in the District ROWs would be restricted between 8:00 a.m. and 6:00 p.m. Construction work in public roadways would occur between 9:00 a.m. and 9:00 p.m., Monday through Friday. Since construction would occur during the summer, nighttime construction lighting would not be required. Thus, visual impacts related to light and glare would be less than significant.

3.2.3 Geology, Soils, and Seismicity

This section evaluates whether construction and operation of the Happy Valley Pipeline project would result in adverse impacts related to geology, existing soil conditions, or seismicity. The analysis is based in part on review of available geologic and geotechnical information, including:

- Draft Geological/Geotechnical Assessment, Miner Road Pipeline Project, Phase II, AMEC Geomatrix, Inc. (AMEC, 2010); and
- Publically available soils, geologic, and seismic hazard information from federal and state agencies.

This discussion focuses on increased exposure of people, structures, and the environment to hazards including ground shaking, slope failure, and accelerated erosion. The setting section is followed by the analysis of impacts and a discussion of necessary mitigation measures.

Environmental Setting

Topography

The proposed pipeline alignment ranges from an elevation of approximately 480 feet to 640 feet above sea level. Generally, gradients along the Miner Road segment of the proposed pipeline range from less than 5 to 15 percent[1] within a hilly residential neighborhood. Within the District ROWs, the pipeline crosses Lauterwasser Creek, which is deeply incised with steep side-slopes. A broad fluvial terrace[2] is about 30 feet above the creek bed. A small portion of the bank along the ROW adjacent to the south side of the creek has a nearly-vertical slope. The District ROW on the north side of the creek generally has slopes less than 7 percent.

Geology

Regional mapping indicates that the project area is underlain by latest Pleistocene (between 11,800 and 30,000 years old) alluvium in the vicinity of the District ROWs and Van Ripper Lane segments; and the Briones Formation along the Miner Road segment (USGS, 1994; USGS, 2006). A description of each of the geologic formations is provided below:

- **The Briones Formation** is described as being middle to late Miocene in age (5 to 16.4 million years old), and composed of sandstone, siltstone, conglomerate, and shell breccia (USGS, 1994). It is the hill-forming bedrock in the vicinity of the proposed project and is generally well weathered near the ground surface.

- **Latest Pleistocene Alluvium** is regionally described as being located on gently sloping to level alluvial fan or terrace surfaces where latest Pleistocene age is indicated by depth of stream incision, development of clay-rich soil horizons, and lack of historical flooding. These deposits are most typically composed of intercalated sand, silt, and gravel that are poorly to moderately sorted. In the project vicinity, individual fan, basin, and terrace units are not differentiated because they cannot be mapped at the scale of the regional-scale source map (USGS, 2006). Thus, the District ROWs are described below using project-specific information developed for the project.

A draft geological assessment for the project described the District ROWs based on surficial soil mapping and two subsurface soil borings (AMEC, 2010). Materials encountered in the borings and creek bank exposures indicate that the fluvial terrace is predominantly made up of Pleistocene alluvium composed of sandy sediments with variable amounts of clay. The clay-content increases toward the ground surface, where a natural clayey soil is developed on the surface of the fluvial terrace. In addition, locally coarse layers and lenses (composed of clean sand, gravel and cobbles) are evident in creek bank exposures. The depth to bedrock, described as thinly-bedded and closely fractured shale[3], is estimated to occur 20 to 25 feet beneath the terrace surface (AMEC, 2010). This bedrock is visible at the surface several feet above the bed of Lauterwasser Creek.

1 Slopes expressed as gradients take the ratio of the vertical rise by the horizontal run, multiplied by 100.
2 One in a series of level surfaces in a stream valley, flanking and more or less parallel to the stream channel, originally occurring at or below, but now above, the level of the stream, and representing the dissected remnants of an abandoned flood plain, stream bed or valley floor produced during a former stage of erosion or deposition.
3 Shale is a fine-grained sedimentary rock composed of mud that is commonly friable and thinly-bedded.

Soils

Overlying the geologic units described above is a mantle of soil that varies in thickness and character. In general, soil characteristics are strongly governed by slope, relief, climate, vegetation, and the rock type upon which they form. Soil types are important in describing engineering constraints such as erosion and runoff potential, corrosion risks, and various behaviors that affect structures, such as expansion and settlement. **Table 3.2.3-1** lists the soil units mapped by project segment, and their key physical characteristics.

TABLE 3.2.3-1
KEY SOIL PROPERTIES

Segment	Soil Type and Symbol	Slope	Hydrologic Group[1]	Risk of Corrosion[2]	Depth (In)	Texture	Shrink-Swell Potential[3]
District ROWs and Van Ripper Lane	Cropley clay (CkB)	2–5%	D	High/ Low	0-24	Clay	High
					24-60	Clay	High
Miner Road	Los Osos Clay Loam (Lhe)	15-30%	C	High/ Moderate	0-10	Clay Loam	Moderate
					10-32	Clay	High
					32-36	Weathered Bedrock	Low

1 Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups (A through D, in order of increasing runoff) according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

2 "Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. First rating is for concrete, second is for uncoated steel.

3 Shrink swell is rated as low, moderate, high or very high. Shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design is commonly needed.

SOURCE: NRCS, 2010.

In addition to the natural soils described above, it is expected that soils along the pipeline alignments will be largely composed of previous backfill soils that were used during the installation of the original pipeline. In the vicinity of the District ROWs, these soils are described as loose to medium dense sandy clay (AMEC, 2010).

Faulting and Seismic Hazards

The proposed project is not located within an Alquist-Priolo Earthquake Fault Zone, as designated through the Alquist-Priolo Earthquake Fault Zoning Act, and no mapped active faults are known to pass through the immediate project area. The seismic setting, therefore, is regional in nature and is the same as described in the WTTIP EIR.

To summarize, it is expected that the project area would experience a strong regional earthquake during its operational lifetime. The closest active fault is the Hayward Fault (6 km away), which is expected to have the highest probability of producing a large damaging earthquake in the next 30 years. A characteristic earthquake on the Hayward Fault (with a maximum expectable

earthquake magnitude of 7.1) is expected to produce a Peak Ground Acceleration[4] of 0.54g at the project site. This level of ground-shaking is expected to result in slight damage to structures designed according to modern building codes, and would be sufficient to induce secondary ground motions such as liquefaction and lateral spreading in susceptible soils.

Liquefaction Susceptibility

Liquefaction is a transformation of soil from a solid to a liquefied state during which saturated soil temporarily loses strength resulting from the buildup of excess pore water pressure most commonly caused by ground shaking during an earthquake. Soil susceptible to liquefaction includes loose to medium dense sand and gravel, low-plasticity silt, and some low-plasticity clay deposits. Soil liquefaction and associated ground failure can damage roads, pipelines, underground cables, and buildings with shallow foundations. Liquefaction can occur in areas characterized by water-saturated, cohesionless, granular materials at depths less than 40 feet. Soil that liquefies can manifest a number of behaviors, including lateral spread[5], rapid settlement and flow slides. Mapping by the USGS of liquefaction susceptibility in the Bay Area has rated the liquefaction susceptibility of the ROW and Van Ripper Lane segments as low, and the Miner Road segment as very low (USGS, 2006). However, the geologic investigation described the banks on either side of Lauterwasser Creek as being 28 feet high and composed of predominantly sandy materials, and estimated the water table at the site to be at or near the level of the creek. For these reasons, liquefaction, lateral spreading or flow slides during an earthquake could possibly occur.

Landslides and Slope Failures

A slope failure is a mass of rock, soil, and debris displaced down a slope under the influence of gravity by sliding, flowing, or falling. Several factors affect the susceptibility of an area to experience slope failure, including slope steepness; the material strength and bulk density of soil or bedrock; the width, orientation and pervasiveness of bedrock fractures or bedding planes; prevailing groundwater conditions; and the type and distribution of vegetation. Those features, among others, are important factors that describe the predisposition of a sloped surface to fail, while external processes such as exceptionally heavy rainfall, stream-undercutting, earthquakes, or human activities (e.g. road cuts, over-steepened slopes, large-scale vegetation removal) may trigger or reactivate a slope failure.

The WTTIP EIR discussed the general nature and occurrence of landslides and slope failure, indicating the Oakland-Berkeley hills could experience some earthquake-induced rockfalls, slumps, and debris flows during an event on the Hayward Fault or other active Bay Area fault capable of generating strong ground motion. The proposed pipeline alignment includes the crossing of Lauterwasser Creek, where evidence of slope instability is common along the creek

4 PGA is expressed as a fraction of the acceleration due to gravity (g), which is approximately 980 centimeters per second squared. In terms of automobile accelerations, one "g" of acceleration is equivalent to the motion of a car traveling 328 feet from rest in 4.5 seconds.

5 Lateral spreading of the ground surface during an earthquake usually takes place along weak shear zones that have formed within a liquefiable soil layer. Lateral spreading has generally been observed to take place in the direction of a free-face (e.g. a retaining wall or slope).

banks. Several shallow landslides (estimated to be on the order of 5 feet thick) affect the creek banks in the project vicinity. Scarps, unusually steep slopes lacking vegetation, and/or accumulations of debris at the base of slopes also indicate regions of active surface creep[6]. Locally, stream erosion has undercut the banks, contributing to the slope instability (AMEC, 2010).

On the southern side of Lauterwasser Creek, landsliding extends particularly far upslope within the District's ROW (AMEC, 2010). At this location, a trough in the ground surface that is approximately coincident with the ROW boundaries extends up the creek bank about 60 feet from the creek channel (as measured horizontally along the alignment). Some of the backfill from the existing pipeline has slumped down slope after it was installed in 1946. Two mature trees (approximately 30 inches in diameter), adjacent to the trough on the east side, are leaning (about 20 degrees) toward the trough. This suggests that the native alluvium adjacent to the existing pipeline trench has lost lateral support and has crept toward the trough.

A cavity that is nearly two feet wide and one foot high extends several feet back into the creek bank directly over the existing pipeline encasement in the creek and downslope of the landslide. This cavity likely was caused by water seeping out of the creek bank along top of the concrete encasement. It is not clear whether the seepage was caused by pipe leaks or natural percolation of rainwater through the pipe backfill or natural ground, but it is likely that this seepage has contributed to slope instability (AMEC, 2010).

Mineral Resources

The California Geological Survey (CGS) has classified lands within the San Francisco Bay region into four Mineral Resource Zones (MRZs). The MRZ classifications are based on guidelines adopted by the California State Mining and Geology Board, as mandated by the Surface Mining and Reclamation Act of 1975. The project area is mapped by the CGS as a MRZ-4 zone which designates areas where available information is inadequate for assignment to any other MRZ category (Stinson et al., 1987). Further, the project area is not within a mineral resource area as designated by Contra Costa County (Contra Costa County, 2005).

Regulatory Framework

The WTTIP EIR describes laws pertaining to geotechnical building standards, including Dam Safety Regulations and the California Building Code (see pp. 3.4-14 to 3.4-15). However, the California Building Code has been updated since adoption of the WTTIP EIR, particularly with respect to seismic design. The following provides a discussion of the updated building code.

6 The gradual, downhill movement of soil and loose rock material on a slope that may be very gentle but is usually very steep.

California Building Code

The California Building Code (CBC) has been codified in the California Code of Regulations (CCR) as Title 24, Part 2. Title 24 is administered by the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under State law, all building standards must be centralized in Title 24 or they are not enforceable. The purpose of the CBC is to establish minimum standards to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, and general stability by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all building and structures within its jurisdiction. The 2007 CBC is based on the 2006 International Building Code (IBC) published by the International Code Conference. In addition, the CBC contains necessary California amendments which are based on the American Society of Civil Engineers (ASCE) Minimum Design Standards 7-05. ASCE 7-05 provides requirements for general structural design and includes means for determining earthquake loads as well as other loads (such as wind loads) for inclusion into building codes. The provisions of the CBC apply to the construction, alteration, movement, replacement, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California.

Impacts and Mitigation Measures

Significance Criteria

Consistent with the WTTIP EIR, the proposed project would result in a significant impact if it would:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault
  - Strong seismic groundshaking
  - Seismic-related ground failure, including liquefaction
  - Landslides
- Result in substantial soil erosion or the loss of topsoil;
- Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in onsite or offsite landslide, lateral spreading, subsidence (i.e., settlement), liquefaction, or collapse;
- Be located on expansive soil, as defined in Table 18-1-B of the 1994 Uniform Building Code, creating substantial risks to life or property; or
- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

Based on the proposed construction and operation of the project, and the geologic environment in the project area, the proposed project would not result in impacts related to fault rupture, wastewater disposal, or mineral resources. No impact discussion is provided for these topics for the following reasons:

- *Fault Rupture.* The faults most susceptible to earthquake rupture are active faults, which are faults that have experienced surface displacement within the last 11,000 years. There are no active faults that cross the project site. Therefore, the potential for fault rupture to affect the proposed project is very low.

- *Corrosivity.* Despite the identification of corrosive soils in the project area, modern pipeline construction materials and methods (such as protective coating) reduce the potential for corrosion to a less-than-significant level.

- *Wastewater Disposal.* The proposed project does not require the use of septic or other alternative disposal wastewater systems, and therefore no impact associated with this hazard would result.

- *Mineral Resources.* None of the project elements would alter, destroy, or limit access to any existing significant mineral resources.

Methodology

Geologic and seismic impacts related to construction and operation of the proposed project in the roadway segments would be the same to those discussed in the WTTIP EIR. The following impact analysis focuses solely on potential impacts within the District ROW segments between Miner Road and Van Ripper Lane. Based on current changes to the proposed project, this analysis determined that the following potential impacts identified in the WTTIP EIR would not apply to the proposed project:

- *Impact 3.4-5: The effects of squeezing ground during tunnel construction, which could damage interior supports.* Squeezing ground is a tunneling term used to describe the slow advancement of exposed, low-strength rock surfaces into a tunnel, often associated with materials that have a low swelling capacity and high overburden pressure.[7] This phenomenon is not applicable to the proposed project because the proposed project does not involve tunneling. Other soil phenomena (such as expansion or settlement) that could adversely affect pipeline improvements are addressed in Impact 3.4-3.

Impacts and Mitigation Measures

Impact 3.4-1: Potential injury and/or damage resulting from unstable slopes.

The WTTIP EIR anticipated that construction and operation of the Happy Valley Pipeline would have a low susceptibility to landslide hazards because the pipe would be buried within the roadway and would not be affected by several small adjacent landslide deposits. Mitigation Measure 3.4-1 was proposed in the WTTIP EIR to ensure that all pipelines in high landslide

[7] Overburden pressure is the vertical pressure from overlying materials.

hazard areas use piping material that enables the pipe to deform without rupture. In addition, the mitigation required a geotechnical evaluation for all pipes in high hazard areas that have a diameter of more than 12 inches. It was concluded that implementation of the mitigation measure would reduce potential impacts to a less-than-significant level. Both the Miner Road and Van Ripper segments of the new pipeline alignment analyzed in this SEIR would be within existing roadways and would be within a similar environment as that described in the WTTIP EIR. Thus, the conclusions and mitigation measures discussed in the WTTIP EIR are equally applicable to these segments of the proposed project.

However, as discussed in the setting, the District ROWs include the steep ravine of Lauterwasser Creek. Several existing landslides have been mapped on the banks of the creek and special care will be needed during design and construction to avoid or reduce potential hazards from sloughing, slumping or deformation of soil along the pipeline alignment. During construction, soil movements could threaten the safety of construction workers and compromise the successful installation of the pipeline; whereas continued soil movement following construction would possibly cause damage to or disrupt pipeline operations. These would be potentially significant impacts that were not specifically addressed in the WTTIP EIR.

To inform the analysis of impacts for this SEIR, AMEC Geomatrix Inc. (2010) identified potential geologic and geotechnical hazards that may impact the Lauterwasser Creek crossing, and addressed the feasibility of possible construction techniques that may be used to ensure the safe and successful installation of the pipeline. Field reconnaissance and geologic mapping revealed that the original backfill used to install the existing pipeline has been creeping or sliding downslope, and that other areas along the banks of the creek show evidence of recent soil slumps or landslides. Further, geologic borings and laboratory tests showed that the trench walls may be susceptible to caving or sloughing should clayey soil dry out, or should sandy soil be saturated (AMEC, 2010). The failure of the slopes in the short term during construction or in the long term is considered to be a potentially significant impact.

The WTTIP EIR included mitigation to address the potential for slope failure. Measure 3.4-1 required a site-specific design-level geotechnical evaluation during the design phase to provide recommendations to reduce potential slope hazards. This measure has been revised based on the recommendations provided in the preliminary geotechnical review by AMEC Geomatrix Inc. (2010). Implementation of Measure 3.4-1-HVPL (presented below and in Appendix A) would ensure that slope instability impacts would be less than significant.

Mitigation Measure

Measure 3.4-1-HVPL: A site specific geotechnical evaluation has been completed to identify adverse slope instability conditions in the vicinity of the Lauterwasser Creek crossing and to provide design recommendations to reduce and eliminate potential slope hazards (AMEC, 2010). Consistent with the recommendations provided in the geotechnical evaluation, the District will incorporate the following measures to ensure that slope hazards are reduced or eliminated:

- Burying the pipeline deep enough to avoid areas of unstable soil

- Bedding and backfilling the pipeline in concrete, slurry cement backfill, or controlled density fill to ensure the stability of the pipeline and surrounding fill
- Minimizing the amount of time trench excavations are left open before being backfilled, ensuring that the length of excavated trench does not exceed the amount of pipeline that can be installed by the end of a day
- Performing work during the dry season to minimize the potential to encounter groundwater
- Removing loose soil and rock along the creek banks, and installing bank stabilization and/or erosion control features within the District ROW to prevent sloughing and caving
- Backfilling the excavations and filling all voids on the sidewalls/side slopes with engineered material to prevent excessive settlement and movement of the backfill
- Encasing the pipe in concrete along the bottom and on portions of the steep bank of Lauterwasser Creek to protect the pipe
- Developing and implementing a three-year monitoring program to assess the stability of the Lauterwasser Creek banks within the District ROWs

Final design plans for the segment of new pipeline crossing Lauterwasser Creek shall be reviewed and approved by a registered geotechnical engineer or certified engineering geologist.

Several of the above mitigation strategies may result in an increased volume of soil requiring offsite disposal (from increased excavation depths, use of engineered backfills, or rescaling or removal of loose rocks and debris) and long-term geomorphic effects on the bed and banks of Lauterwasser Creek (due to hardened surfaces from slope repair/stabilization measures). Pursuant to Mitigation Measure 3.5-7-HVPL, a licensed hydrological engineer would evaluate how creek flows, sediment transport, and erosion may be affected by the proposed project and the District will implement measures to avoid alteration of drainage patterns and erosion.

Impact 3.4-2: Facility damage or service interruptions resulting from strong groundshaking.

Groundshaking is an unavoidable hazard for structures and associated infrastructure within the entire project region. Project-related improvements would likely experience at least one major earthquake (greater than M 6.7) sometime during the operational lifetime of the project components (USGS, 2003). Most structures, including buried pipelines, are subject to damage from earthquakes. However, in comparison to above-ground structures, underground pipelines are generally less susceptible to damage from strong groundshaking because they are imbedded in compacted backfill that can tolerate more seismic wave motion. According to the California Division of Mines and Geology (now the CGS), a major earthquake on the Hayward Fault would likely damage EBMUD facilities throughout the District service area, but it is unlikely that the entire system would be incapacitated (CDMG, 1987). Modern standard engineering and construction practices (the District's seismic design standards and California Building Code)

include design criteria to mitigate potential damage from an earthquake, and any potential interruption of service would likely be temporary in nature. Therefore, compliance with the District's seismic design standards and California Building Code would ensure that potential facility impacts related to groundshaking are less than significant.

Impact 3.4-3: Facility damage resulting from settlement or uplift caused by expansive or compressible soils.

Proposed project elements could be damaged due to settlement of weak or saturated subsurface soils. Underlying soils at the proposed project sites may also have a high potential for expansion (see Table 3.2.3-1). The "shrink-swell"[8] capacity of expansive soils can cause damage to foundations and pipelines. The proposed project is replacing (or abandoning in place) an existing pipeline for all three segments, which means that the soils in the immediate vicinity would be composed of previous backfill soils rather than undisturbed native soils. Pipeline installations would employ standard engineering and building practices common to construction projects throughout California. Depending on the characteristics of the substrate at the work sites, such standards would likely include over-excavation and placement of clean, nonexpansive engineered fill prior to construction; and/or other measures to reduce concerns related to expansive soils, consistent with the prevailing engineering standard of care. Consistent with Measure 3.4-1-HVPL, the pipeline trenches along the ROW segment would be backfilled with engineered material, which would prevent shrink-swell and excessive settlements from damaging the pipe. Further, the District will include in the contract specifications that any fill will be selected, placed, compacted, and inspected in accordance with plans and specifications prepared by a licensed professional engineer. For the proposed Happy Valley Pipeline project, these measures are consistent with mitigation identified in WTTIP and would reduce the potential impact to a less-than-significant level.

Impact 3.4-4: Potential facility damage resulting from a major earthquake in areas susceptible to liquefaction.

As discussed in the setting, the District ROW and Van Ripper Lane segments are mapped as having a low liquefaction potential, and the Miner Road segment is mapped as having a very low liquefaction potential. However, site-specific data along the District ROWs, as well as geologic evaluations conducted for the WTTIP EIR suggest that the area has a moderate to high liquefaction potential, based on site conditions, including subsurface materials and the depth of groundwater (AMEC, 2010). Liquefaction of susceptible soils during an earthquake could damage pipelines and possibly result in temporary service interruptions. A design-level geotechnical evaluation will be conducted to determine the liquefaction potential along the project alignment, in accordance with Measure 3.4-1-HVPL. If it is determined that soils may be subject to liquefaction, appropriate feasible measures will be developed and incorporated into the project design. Such measures would most likely involve backfilling the trench with engineered fill or using piping material that can deform without rupture (such as ductile steel). Implementation of Measure 3.4-1-HVPL would reduce the potential impact to a less-than-significant level.

8 "Shrink-swell" refers to the cyclical expansion and contraction that occurs in fine-grained clay sediments from wetting and drying.

Impact 3.4-5-HVPL: Impacts due to substantial soil erosion or the loss of topsoil.

The impact of the project on erosion and soil loss with respect to water quality and sedimentation is discussed in *Section 3.2.4, Hydrology and Water Quality*. This impact focuses on the potential for accelerated erosion (such as sheet wash, rilling, rutting, and in more extreme cases, gullying, sloughing or sliding of incised gully sidewalls) to undermine berms, roads, utilities, and foundations. Accelerated erosion most typically occurs on bare, unprotected slopes during the wet season, particularly in response to prolonged, intense storms. The Miner Road and Van Ripper Lane segments would be re-paved, which would prevent long-term, substantial or accelerated soil erosion. The District ROW segments would cross a gully and creek and would not be repaved, and could potentially be subject to accelerated erosion due to its high runoff potential (see Table 3.2.3-1). However, the measures to address water quality, sedimentation, and creek bed and bank erosion discussed in *Section 3.2.4, Hydrology and Water Quality*, would equally reduce the potential for the structural or geotechnical problems associated with accelerated erosion. This includes numerous best management practices for erosion control, in accordance with EBMUD construction specifications, applicable regulatory permitting requirements, and implementation of WTTIP EIR Measures 3.5-1a and 3.5-1b (presented in Appendix A). These erosion control measures would reduce the potential for short- or long-term structural damage to fills, foundations, and other engineered structures to a less-than-significant level.

3.2.4 Hydrology and Water Quality

Existing Setting

General Hydrologic Setting

The proposed Happy Valley Pipeline is located in the San Pablo Creek watershed, which covers 43.5 square miles in West Contra Costa County, including 10,909 acres of EBMUD-protected watershed land. Major water bodies within this watershed include San Pablo Creek, Cascade Creek, Lauterwasser Creek, Bear Creek, Castro Creek, Siesta Valley Creek, Wilkie Creek, Cascade Lake, San Pablo Reservoir, and Briones Reservoir. Impervious surfaces make up approximately 20 percent of the watershed.

San Pablo Creek originates in Orinda, flows northwest along the eastern edge of the Oakland Hills to San Pablo Reservoir, and ultimately discharges to San Francisco Bay near Richmond. Lauterwasser Creek, a perennial tributary, flows into San Pablo Creek approximately one-third mile southeast and upstream of the Orinda Water Treatment Plant, and upstream from the confluence of San Pablo Creek and San Pablo Reservoir. The proposed Happy Valley Pipeline alignment would cross Lauterwasser Creek.

Beneficial Uses of Local Water Bodies

The California Regional Water Quality Control Board (RWQCB), San Francisco Bay Region, lists San Pablo Creek as a significant surface water. Beneficial uses of San Pablo Creek and its

tributaries include fish migration, noncontact water recreation, warm freshwater habitat, and wildlife habitat (RWQCB, 1995). Beneficial uses of San Pablo Reservoir, located downstream of Lauterwasser Creek, include cold freshwater habitat, municipal and domestic supply, water contact recreation, noncontact water recreation, fish spawning, warm freshwater habitat, and wildlife habitat. Although the *Water Quality Control Plan for the San Francisco Bay Basin* (Basin Plan) (RWQCB, 1995) identifies water contact recreation as a beneficial use for this reservoir, such activities are prohibited by EBMUD.

Water Quality

The RWQCB lists San Pablo Creek as an impaired water body for diazinon from urban runoff and lists San Pablo Reservoir as impaired for mercury from atmospheric deposition (RWQCB, 2006).

Lauterwasser Creek at Proposed Pipeline Crossing

As described in Section 3.2.4, Geology, Soils and Seismicity, a geotechnical investigation was performed to evaluate existing conditions of the District ROWs at Lauterwasser Creek (AMEC, 2010). Field observations indicate that the concrete encasement of the existing pipe spanning Lauterwasser Creek is exposed in the creek channel bottom and on the lower portion of the creek bank on the southern side of the channel. The encasement is coincident with an offset in the creek channel alignment, although it is not known whether or not the pipeline encasement caused the realignment of the creek. In addition, near-surface soils along and adjacent to the existing pipeline are experiencing downslope movement, as evidenced by slumping and leaning trees on the southern side of the crossing. A cavity extends several feet back into the southern creek bank directly over the existing pipeline and encasement and downslope of the landslide (AMEC, 2010). Refer to Section 3.2.4 for additional information on soil and slope conditions and erosional features within the District ROWs and along the creek banks.

Regulatory Framework

The WTTIP EIR describes federal, state, and local laws pertaining to hydrology and water quality (see pp. 3.5-11 to 3.5-20). The regulatory framework includes a discussion of the following: construction in waters of the State and the United States; impaired water bodies and total maximum daily loads; National Pollutant Discharge Elimination System (NPDES) waste discharge regulations; the Contra Costa County clean water program; the construction stormwater NPDES permit; regionwide general NPDES permit for discharges from surface water treatment facilities for potable supply; discharge of chlorinated water; existing EBMUD permits and discharges; and EBMUD construction specifications.

Since adoption of the WTTIP EIR, the State Water Resources Control Board (SWRCB) adopted the NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (construction general permit, Order No. 2009-0009). Order No. 2009-0009 became effective July 1, 2010, (supersedes Order No. 99-08) and applies to construction sites that include one or more acre of soil disturbance. Information regarding the new NPDES General Permit as well as additional details regarding the EBMUD construction specifications are provided below.

The construction general permit requires that the landowner and/or contractor file permit registration documents prior to commencing construction and pay an annual fee. These documents include a notice of intent, risk assessment, site map, stormwater pollution prevention plan (SWPPP), and signed certification statement. The permit specifies a risk-based permitting approach that includes requirements specific to three overall levels of risk, determined based on the potential for the proposed project to cause sedimentation as well as the sensitivity of the receiving water to sedimentation. The three risk levels are used to determine specific numeric action levels and effluent limitations for pH and turbidity, as well as requirements for a rain event action plan, implementation of best management practices (BMPs), monitoring, and reporting.

The SWPPP must include measures to ensure that all pollutants and their sources are controlled; non-stormwater discharges are identified and either eliminated, controlled, or treated; site BMPs are effective and result in the reduction or elimination of pollutants in stormwater discharges and authorized non-stormwater discharges; and BMPs installed to reduce or eliminate pollutants after construction are completed and maintained. The SWPPP must demonstrate that calculations and design details as well as BMP controls for site run-off are complete and correct. Non-stormwater discharges include those from improper dumping, accidental spills, and leakage from storage tanks or transfer areas. The construction general permit specifies minimum BMP requirements for stormwater control based on the risk level of the site. Post-construction stormwater performance standards must be included for sites not covered by a municipal stormwater permit. The standards address water quality, runoff reduction, drainage density, and channel protection requirements for the receiving water.

The permit requires effluent and receiving water monitoring to demonstrate compliance with permit requirements, and corrective action must be taken if these limitations are exceeded. The results of the monitoring and corrective actions must be reported annually to the SWRCB. The construction general permit specifies minimum qualifications for a qualified SWPPP developer and qualified SWPPP practitioner.

EBMUD construction specifications and environmental requirements, specify that all water from or flowing from a job site shall be of such purity and cleanliness as not to introduce any contaminants into any watercourse, stream, lake, reservoir, or storm drain system. To meet this objective, construction contractors are required to provide plans, procedures, and controls related to the discharge of water and the control of stormwater during construction. In accordance with EBMUD construction specifications, contractors are required to:

- Prevent silt, eroded materials, construction debris, concrete or washings thereof, or hazardous substances from being introduced into any watercourse, stream, lake, reservoir, or storm drain system;
- Ensure that water does not cause erosion of soil, including imported fill; and
- Ensure that the discharge of soil or other materials does not have an adverse effect on receiving waters or cause or contribute to a violation of water quality standards.

Impacts and Mitigation Measures

Methodology

Hydrology impacts related to construction of the proposed project in the roadways of Miner Road and Van Ripper Lane would be similar to those discussed in the WTTIP EIR. Therefore, the following impact analysis focuses solely on hydrology impacts associated with construction in the District ROWs between Miner Road and Van Ripper Lane.

Significance Criteria

Consistent with the WTTIP EIR, the proposed project is considered to have a significant impact if it would:

- Violate any water quality standards or waste discharge requirements;
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge;
- Substantially alter the existing drainage patterns in a manner that would result in substantial erosion or siltation on or off the site;
- Substantially alter existing drainage patterns or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off the site;
- Create or contribute runoff water that would exceed the capacity of existing or proposed stormwater drainage systems or provide substantial additional sources of polluted runoff;
- Substantially degrade water quality;
- Place housing within a 100-year flood hazard area;
- Place structures within a 100-year flood hazard area that would impede or redirect flood flows;
- Expose people or structures to a significant risk associated with flooding;
- Be subject to inundation by seiche, tsunami, or mudflow; or
- Contaminate a public water supply.

In this section, the hydrology impacts of the proposed Happy Valley Pipeline project are compared to the impact analysis provided in the WTTIP EIR to evaluate whether the WTTIP EIR fully analyzed the hydrological impacts of the proposed pipeline and whether additional impact analysis is warranted. This section provides analysis for two impacts not previously considered in the WTTIP EIR.

Based on project characteristics and the water resources in the area, no significant impacts are anticipated with respect to the following topics, consistent with the WTTIP EIR:

- *Groundwater Resources and Recharge*. Although dewatering would be required during construction of the pipeline within Lauterwasser Creek, any dewatering would be temporary and the post-construction groundwater levels would return to pre-project

conditions. Long-term dewatering would not be required. Therefore, no substantive change in infiltration rates or groundwater recharge would occur during operation of the Happy Valley Pipeline. Water quality impacts related to the discharge of groundwater produced during construction dewatering are discussed in Impact 3.5-2, below.

- *Public Water Supply*. Although the Happy Valley Pipeline project is located within the San Pablo Creek watershed which contains protected watershed lands, compliance with legal requirements for stormwater management and hazardous materials storage during construction and operation would protect the water quality of drinking water supplies (i.e., water in the District's San Pablo Reservoir). Therefore, the proposed project would not contaminate a public drinking water supply.

- *100-Year Flood Zone*. The Happy Valley Pipeline project does not propose the construction of housing, so there would be no impact related to the construction of housing within a 100-year floodplain.

- *Flooding from Failure of a Dam or Levee*. The proposed Happy Valley Pipeline project would not cause flooding due to the failure of a dam or levee, as no dams or levees would be constructed and the project area would not be affected by the existing dams at the San Pablo and Briones Reservoirs.

- *Inundation by Seiche, Tsunami, or Mudflow*. The proposed project is not located near large water bodies capable of generating a seiche or tsunami or in an area subject to mudflows.

Impacts and Mitigation Measures

Impact 3.5-1: Potential degradation of water quality from construction in or adjacent to creeks.

The WTTIP EIR anticipated that construction activities for proposed WTTIP projects, including the Happy Valley Pipeline, would generally be confined within existing roadways or would occur adjacent to developed areas, and direct disruption to creekbeds or surface waters would be limited. However, because construction activities could result in increased erosion and sedimentation at construction sites adjacent to or near creeks, including Lauterwasser Creek, particularly during the rainy season, the WTTIP EIR included Mitigation Measures 3.5-1a and 3.5-1b requiring containment of contaminants from construction equipment, obtaining an encroachment permit from the Contra Costa County Flood Control and Water Conservation District for any work in creek channels, and compliance with California Department of Fish and Game (CDFG), U.S. Army Corps of Engineers (Corps), and RWQCB requirements pertaining to wetlands or streambeds, including associated water quality protection requirements. In addition, EBMUD construction specifications require that the contractor (1) prevent silt, eroded materials, construction debris, concrete or washings thereof, or hazardous substances from being introduced into any watercourse, (2) ensure that water does not cause erosion of soil, including imported fill, and (3) ensure that the discharge of soil or other materials does not have an adverse effect on receiving waters or cause or contribute to a violation of water quality standard. Because the Happy Valley Pipeline project would disturb one or more acres of land, the contractor would further be required to comply with NPDES stormwater permitting requirements (Local Use Program [LUP] General Permit for small linear projects of one to five acres). In accordance with

NPDES stormwater permitting requirements, the contractor(s) would submit the required notices, develop a SWPPP, and implement site-specific BMPs in accordance with the SWPPP to control and reduce discharges of construction-related sediments and pollutants in stormwater runoff into storm drains and any receiving waters.

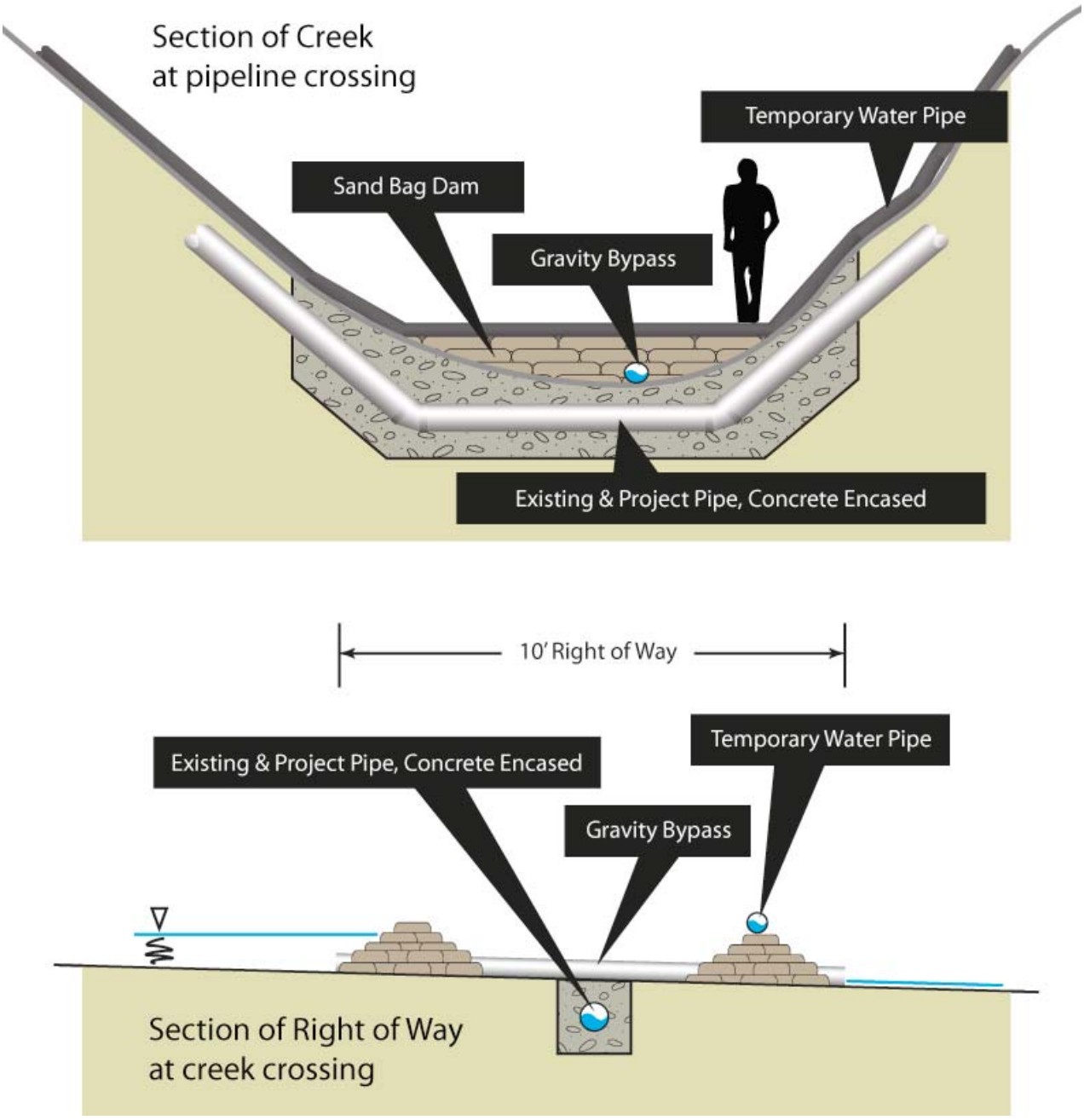
The revised Happy Valley Pipeline alignment would require construction within the bed and banks of Lauterwasser Creek. Lauterwasser Creek is a perennial stream and while flows during summer months are low, the creek flow would need to be bypassed to allow construction in the creek bed. As described in the Chapter 2, Description of the Proposed Project, the creek would be dammed with sand bags and silt fencing along the upstream edge of the District ROWs and directed into a bypass pipe that would convey flows downstream of the excavation (see **Figure 3.2-2**). Any water that seeps into the excavated trench in the creek bed would be pumped to tanks located in Miner Road or Van Ripper Lane for treatment and disposal. Sand bags would be constructed along the downstream edge of the District ROWs to ensure that any excavated material is not discharged into the creek. Construction activities within the creek would include removal of the existing concrete-encased pipeline and installation of the new pipeline. While construction activities within Lauterwasser Creek under the proposed project are more intensive than those anticipated for the original Happy Valley Pipeline in the WTTIP EIR, the impacts to water quality would remain less than significant with compliance with EBMUD construction specifications, applicable regulatory permitting requirements, and implementation of Measures 3.5-1a (presented in Appendix A) and 3.5-1b-HVPL, presented below and in Appendix A.

Mitigation Measure

> **Measure 3.5-1b-HVPL:** EBMUD and its contractor(s) will comply with CDFG and U.S. Army Corps of Engineers requirements pertaining to wetlands or streambeds, including associated water quality protection requirements of the RWQCB.

Impact 3.5-2: Degradation of water quality from dewatering.

The WTTIP EIR determined that excavation for the Happy Valley Pipeline could require groundwater dewatering and discharge to adjacent surface waters; depending on the quality of the groundwater, such discharge to surface waterways could affect surface water quality. As described in Chapter 2, Description of the Proposed Project, any water that seeps into the excavated trench in the creek bed would be pumped to tanks located in Miner Road or Van Ripper Lane for treatment and disposal rather than discharged to the creek, minimizing the potential for degradation of water quality from dewatering. In addition, the contractor would be required by EBMUD construction specifications to prepare a water control and disposal plan for the discharge, identifying the appropriate disposal method for groundwater extracted during dewatering, in compliance with the regulations of the RWQCB and Contra Costa County flood control district. Consistent with the WTTIP EIR and with compliance with regulatory requirements and EBMUD construction specifications, water quality impacts related to construction dewatering would be less than significant for the Happy Valley Pipeline project, and no mitigation is required.



SOURCE: ESA

Happy Valley Pipeline SEIR . 204369.02

Figure 3.2-2
Lauterwasser Creek Crossing Schematic

Impact 3.5-3: Construction in 100-year flood zones.

The WTTIP EIR determined that the construction of the Happy Valley Pipeline within a 100-year flood zone could impede flood flows and discharge sediments and pollutants to flood flows if a flood occurred during construction. This could be a significant impact. However, with implementation of WTTIP EIR Measure 3.5-3 (presented in Appendix A), which prohibits the stockpiling of soil, storage of hazardous materials, and stockpiling of construction materials in flood zones during the rainy season, the water quality impacts related to construction in 100-year flood zones would be less than significant.

Impact 3.5-4: Discharge of chloraminated water to surface water during construction.

The WTTIP EIR discussed the potential discharge of treated (chloraminated) water during construction. The release of chlorinated water and or other substances that are toxic to aquatic organisms into Lauterwasser Creek, or any other surface water body, is prohibited by the RWQCB Basin Plan. The existing Happy Valley Pipeline would have to be drained prior to its removal. In accordance with EBMUD construction specifications, if the pipeline water cannot be emptied within the water distribution system, the contractor would be required to prepare a water control and disposal plan for any water that would be discharged. Water is typically discharged to the sanitary sewer, in compliance with a discharge permit from the local sanitary district; however, the water could be dechlorinated and discharged to the creek in accordance with RWQCB requirements. In this case, EBMUD construction specifications require that the contractor perform sampling and analysis to verify that the discharge has a non-detectable total chlorine residual and a pH greater than 6.5 and less than 8.5. Because the contractor specifications for water disposal would be compliant with RWQCB discharge requirements to minimize the effect on aquatic organisms, the potential impact of discharge of treated water (if any) to surface water during construction would be less than significant.

Operational Impacts

Impact 3.5-5: Operational discharges of chloraminated water to surface water.

The WTTIP EIR analyzed operational discharges of chloraminated water that would occur from new reservoirs and clearwells and from the filter backwash water recycle system at the Lafayette Water Treatment Plant under the Lafayette Reclaimed Water Pipeline Project. These impacts would not apply to the proposed Happy Valley Pipeline project as no chloraminated water would be discharged during regular operations.

Impact 3.5-6: Changes in impervious surfaces and stormwater runoff.

As summarized in the WTTIP EIR, projects that involve the creation or replacement of less than 10,000 square feet of impervious surfaces and those that are constructed in a public right-of-way would not be subject to the municipal stormwater permitting requirements for construction. Because the Happy Valley Pipeline project would primarily be constructed within existing paved

roadways (Miner Road and Van Ripper Lane) there would be no change in impervious surfaces following construction of those segments. Within the District ROWs, the pipeline would be installed beneath the ground surface. The pipeline would be encased in concrete within the bed of Lauterwasser Creek, similar to the existing pipeline, therefore, water quality impacts related to an increase in impervious surfaces would be less than significant, and no mitigation is required.

This analysis determined that the revised Happy Valley Pipeline alignment could result in two additional hydrology and water quality impacts that were not addressed in the WTTIP EIR. These impacts and mitigation measure are described below.

Impact 3.5-7-HVPL: Alteration of long-term drainage patterns that would result in substantial erosion or flooding.

Project construction activities would involve excavation within the bed and bank of Lauterwasser Creek for the removal of the existing 8-inch pipe and concrete encasement, and installation of the new pipe. Depending upon the pipeline design and final location, the proposed project could affect the direction of creek flows which could result in erosion of the creek banks. This would be a significant impact. As discussed above in the Setting, the geotechnical analysis indicates that the existing pipeline encasement is exposed within the creek bed and suggests the possibility that this may contribute to the observed offset in the alignment of Lauterwasser Creek, local bank erosion, and instability.

Construction of the existing pipeline in Lauterwasser Creek (completed in 1946) may have altered the topography of the creek bed and changed the natural erosion patterns. The proposed project design calls for filling the pipe trench in the creek bed with cement to match the grade of the surrounding creek bed. Providing a concrete base in the creek bed and installing bank stabilization (e.g. riprap or concrete) and/or erosion control (e.g. anchored wire mesh) to prevent sloughing and caving of the creek bank as identified in Measure 3.4-1-HVPL, could alter natural hydrological creek processes and would promote the alteration of drainage patterns, erosion and slope instability in Lauterwasser Creek.

Measure 3.5-7-HVPL, below, requires that a licensed engineer evaluate how creek flows and erosion may be affected by the proposed project and to implement measures proposed by the engineer designed to avoid alteration of drainage patterns and erosion. Measure 3.6-2c (presented in Appendix A) requires that the District recontour and revegetate disturbed portions of the creek. Prior to any construction within the creek, the District must obtain appropriate permits from regulatory agencies including RWQCB, CDFG, and the Corps. These agencies will review the proposed designs as part of the District's permit applications. Permits will stipulate site restoration requirements to ensure the integrity of Lauterwasser Creek is maintained (permit conditions will likely expand on, and supersede, restoration set forth in Measure 3.6-2c). With implementation of Mitigation Measures 3.5-7-HVPL and 3.6-2c, and compliance with regulations and agency permitting requirements, this impact would be less than significant.

Mitigation Measure

Measure 3.5-7-HVPL: Prior to construction, a licensed engineer or hydrologist will evaluate the effect of the Project on drainage patterns, sediment transport, and erosion in Lauterwasser Creek. The analysis shall consider feasible designs in the restoration of the creek bed and banks within the District's ROWs after pipeline construction to avoid adverse alteration of creek flows and minimize erosion of the bed and banks of Lauterwasser Creek. Consistent with the recommendations of the licensed engineer, the District will incorporate measures that ensure the following:

- Restoration of the creek bed will be completed in a manner as to avoid adverse changes in the direction of creek flows that could increase erosion of the creek banks.

- Restoration of the creek banks with erosion control measures will be completed in a manner as to avoid erosion of the restored bank and to avoid adverse changes in the direction of creek flows that could increase erosion of the creek banks upstream or downstream of the restored area.

If required, the District will obtain approval of proposed designs by the appropriate regulatory agencies, including the US Army Corps of Engineers, CDFG, and RWQCB, and incorporate the licensed engineer's design recommendations into the proposed project.

Implementation of Measure 3.5-7-HVPL could potentially result in a longer construction duration, increased excavation, and additional dewatering. Potential secondary impacts of implementation of this mitigation measure may include increased noise and traffic impacts due to a longer construction period, additional truck trips, and water disposal.

Impact 3.5-8-HVPL: Potential long-term degradation of water quality from construction in or adjacent to creeks.

The proposed project involves replacement of 250 feet of existing 8-inch-diameter cast iron pipe with cement joints that was installed in 1946and approximately 100 feet of 8-inch-diameter steel pipeline encased in concrete located within the creek bed and banks. Broken pieces of old pipe would be buried in place with pipe bursting. Some corrosion of cast iron may occur over time as a result of the free graphite content of cast iron, resulting in an insoluble graphitic layer of corrosion products on the pipe surface. Corrosion and release of the iron itself by galvanic or electrochemical processes would be unlikely to occur in site soils (Cast Iron Soil Pipe Institute, 2010). Pipe bursting would not result in a substantial increase in corrosion products already present on the existing pipe exterior. Due to the insoluble nature of the corrosion products, there would be limited migration of corroded material, if any exists. Therefore, the potential long-term degradation of water quality from pipe-bursting would be less than significant.

3.2.5 Biological Resources

This chapter discusses the biological resources that may be impacted by the Happy Valley Pipeline project, including special-status plants and wildlife, sensitive natural vegetation communities, wetlands as defined by the federal Clean Water Act and the state's Porter-Cologne Water Quality Control Act, and protected trees.

Environmental Setting

Natural Vegetation Communities

Within the project area there are four natural vegetation communities, following the classification system in *List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database* (CDFG, 2003): developed and ornamental landscaping, non-native grassland, mixed riparian woodland, and coast live oak – valley oak woodland. These communities and their associated wildlife habitats are described in the WTTIP EIR (pp. 3.6-2 – 3.6-9). Coast live oak – valley oak woodland is defined as a community of high priority for inventory by California Department of Fish and Game (CDFG), and occurs in the project area on the south side of Lauterwasser Creek and surrounding the staging area located at the proposed pumping plant site.

Streams

There is one perennial creek that runs through the project area, Lauterwasser Creek. This Creek is subject to the U.S. Army Corps of Engineers (Corps) and Regional Water Quality Control Board (RWQCB) jurisdiction under Sections 404 and 401 of the Clean Water Act, respectively, and CDFG jurisdiction under Sections 1600–1616 of the California Fish and Game Code. The riparian corridor of Lauterwasser Creek is also protected under Sections 1600–1616 of the California Fish and Game Code.

Wildlife Movement Corridors

Wildlife movement corridors link areas of suitable wildlife habitat that are otherwise separated by rugged terrain, changes in vegetation, or by areas of human disturbance or urban development. Topography and other environmental conditions in combination with urbanization have fragmented or separated large open space areas, creating isolated "islands" of vegetation that may not provide sufficient area to accommodate sustainable populations, and can adversely affect genetic and species diversity. Movement corridors mitigate the effects of this fragmentation by allowing animals to move between remaining habitats, which in turn allows depleted populations to be replenished and promotes genetic exchange with separate populations. While most of the pipeline alignment is in a paved roadway, Lauterwasser Creek is likely a movement corridor for wildlife in the area.

Special-Status Species

The WTTIP EIR (p. 3.6-11) defines those plant and wildlife species that are considered special-status. Of the 29 special-status plant species considered in the WTTIP EIR, the following have a moderate potential of occurring in the project area: big-scale balsamroot (*Balsamorhiza*

macrolepis var. *macrolepis*), Mt. Diablo fairy-lantern (*Calochortus pulchellus*), Diablo rock-rose (*Helianthella castanea*), western leatherwood (*Dirca occidentalis*), and Northern California black walnut(*Juglans hindsii*). These species are not protected under the federal or state endangered species acts, but are considered former federal species of concern and/or are listed by the California Native Plant Society (CNPS). Since publication of the WTTIP EIR in 2006, no additional plants potentially present in the project footprint have been listed as special-status, and there are no additional CNDDB records of special-status plant species in the project area that were not already considered in the WTTIP EIR (CDFG, 2010; CNPS, 2010; USFWS, 2010).

Of the 61 special-status wildlife species considered in the EIR, the following species have a moderate or high potential to occur in the revised Happy Valley Pipeline alignment: California red-legged frog (*Rana draytonii*), western pond turtle (*Actinemys marmorata*), Cooper's hawk (*Accipiter cooperii*), oak titmouse (*Baeolophus inornatus)*, rufous hummingbird (*Selasphorus rufus)*, Allen's hummingbird (*Selasphorus sasin)*, Bewick's wren (*Thryomanes bewickii*), mountain lion (*Felis concolor)*[9], San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens)*, and six species of bats. None of these species were observed during field surveys in July 2010. Since publication of the WTTIP EIR, no additional wildlife species potentially present in the project footprint have been listed as special-status, and there are no additional CNDDB records of special-status wildlife species in the project area that were not already considered in the WTTIP EIR (CDFG, 2010; USFWS, 2010).

In addition to the above species, the Alameda whipsnake (*Mastcophis lateralis euryxanthus)* has a low potential to occur in the project area but is considered in this SEIR for several reasons: it is a federal and state threatened species, it has been documented in open to partially open scrub communities as near as 1.25 miles from the project area, there is suitable habitat for this species approximately 1,000 feet from the southern portion of the proposed alignment, the vegetation in nearby residential yards is structurally similar to many native habitats for this species and the yards are fairly large and would not prevent snake movement, and this species could occasionally disperse through the area. Alameda whipsnake expert Karen Swaim conducted a habitat assessment for this species in 2010, and determined that the potential to encounter the Alameda whipsnake in the project area is low to moderate, but nevertheless does exist (Swaim, 2010). The proposed pipeline would be underground, and all unpaved habitat would be restored at the end of project activities.

Two species were considered as having a moderate potential to occur in the project area in the WTTIP EIR, but under this SEIR they are considered to have only a low potential to occur: Central California Coast steelhead (*Oncorhynchus mykiss*) and foothill yellow-legged frog (*Rana boylii*). Steelhead have not been identified in Lauterwasser Creek during extensive surveys by EBMUD biologists, and foothill yellow-legged frogs probably historically occurred in Lauterwasser Creek, but are believed to be extirpated from the area.

[9] The mountain lion is not federally or state threatened or endangered, nor is it a California species of special concern. However in 1990, California designated the mountain lion a "special protected mammal."

Regulatory Framework

Federal, state, and local laws pertaining to the proposed project are discussed in the WTTIP EIR (see pp. 3.6-16 to 3.6-22). No substantial changes to these laws have occurred since adoption of the WTTIP EIR that would affect the analysis.

Impacts and Mitigation Measures

Significance Criteria

Consistent with the WTTIP EIR and Appendix G of the 2010 CEQA Guidelines, the Happy Valley Pipeline project is considered to have a significant impact if it would result in:

(a) Substantial adverse effects to any species identified as a threatened, endangered, candidate, sensitive, or special-status species in local or regional plans, policies, regulations or by lists of species of concern from the CDFG, USFWS, or as defined by Section 15380 of the CEQA Guidelines.

(b) Substantial adverse effects to habitat (including habitats for rare and endangered species, as defined by Fish and Game Code 903) or other sensitive natural community identified in local or regional plans, policies, regulations, or by lists compiled by the CDFG or USFWS.

(c) Substantial adverse effects to federally protected wetlands (including but not limited to marshes and riparian areas), as defined by Section 404 of the Clean Water Act, or riparian and marsh areas under the jurisdiction of the CDFG, as defined by Fish and Game Codes 1601–1603.

(d) Substantial interference with movement of any native resident or migratory fish or wildlife species or with established migration or dispersal corridors.

(e) Removal or damage to trees considered protected.

(f) Conflicts with any applicable habitat conservation plan.

As discussed above, it is the practice of the District to work with host jurisdictions and neighboring communities during project planning and to conform to local environmental protection policies to the extent possible. For the purpose of this SEIR, tree ordinance policies that define protected trees, including heritage trees, are used herein as guidelines for determining significance criteria.

There are no approved habitat conservation plans in the project vicinity. Therefore, no further discussion of this topic is provided.

The proposed project would not result in significant impacts to common plant and wildlife species. Direct impacts to common plant species and communities, such as non-native grassland, include temporary habitat loss and fragmentation and mortality of plant species. Direct impacts to common wildlife species include both mortality of resident species, temporary habitat loss and degradation, and possibly reduced value for local wildlife movement during and immediately after construction activities. Although project sites would continue to facilitate wildlife movement through the project area, construction of facilities and pipelines would result in some temporary

displacement of wildlife. In addition, common wildlife populations could be temporarily reduced due to habitat modification and mortality of individuals. Habitat for common aquatic species could be temporarily affected through construction activities within and adjacent to Lauterwasser Creek. However, implementation of best management practices, including sedimentation and erosion control, water quality protection measures, and revegetation of disturbed areas, would avoid or minimize significant impacts to aquatic habitat and species in downstream habitats.

Methodology

When compared with the analysis provided in the WTTIP EIR, and in light of the project changes, the following impacts and mitigation measures identified for the proposed project would not change:

- *Impact 3.6-5: Adverse effects to special-status bat species*. No bat roosts were observed in the proposed pipeline alignment, but they could occur in trees or buildings in/near the proposed construction. If present, they could be directly affected by roost removal, or indirectly impacted through project-related noise and vibration. This impact was determined to be less than significant in the WTTIP EIR for the Happy Valley Pumping Plant and Pipeline project with implementation of Measure 3.6-5 (i.e., preconstruction bat surveys, no-disturbance buffers around maternity bat colonies, and roost removal only if necessary and when bats are least likely to be affected). Under the proposed project, this impact would remain less than significant with implementation of Measure 3.6-5 (see Appendix A).

- *Impact 3.6-8: Disruption to existing migratory wildlife corridors on WTTIP project sites and some fragmentation of this wildlife habitat*. Potential wildlife movement corridors in the project area include Lauterwasser Creek, and any restrictions to wildlife movement in the creek or riparian corridor during construction would be temporary and minor. This impact was determined to be less than significant in the WTTIP EIR for the Happy Valley Pumping Plant and Pipeline project, and would remain the same under the proposed project since the level of potentially significant impacts to wildlife movement would remain the same.

This analysis determined that the revised Happy Valley Pipeline alignment would result in greater impacts to trees and wetlands compared to what was identified in the WTTIP EIR. Therefore, Impacts 3.6-1 and 3.6-2 are discussed below. While impacts to special-status plants, nesting birds and raptors, dusky-footed woodrat, and aquatic resources (Impacts 3.6-3, 3.6-4, 3.6-6, and 3.6-7) would be similar to those identified in the WTTIP EIR, associated mitigation measures have been revised for the proposed project and are also described below. This analysis also addresses one additional biological impact that was not addressed in the WTTIP EIR – potential adverse effects to the Alameda whipsnake. This impact and mitigation measure is described below.

Impacts and Mitigation Measures

Impact 3.6-1: Loss of or damage to protected trees.

Construction of the proposed pipeline in the District ROWs would require the removal of 15 – 25 trees and trimming of 15 – 35 trees. In addition, construction in roadways would require some trimming of overhanging branches and roots (see Figure 2-2). Many of these trees are protected

by the City of Orinda because they are either: (1) a valley oak, coast live oak, or black oak with a diameter at breast height (dbh) of 12 inches or greater; or (2) a native tree, four inches dbh or greater, and within 30 feet of Lauterwasser Creek's top of bank (these trees are considered native riparian trees) (City of Orinda, 1998). Impacts to protected trees would remain less than significant with implementation of Measures 3.6-1a and 3.6-1b, as revised below, and Measures 3.6-1c and 3.6-1d, as presented in Appendix A.

Mitigation Measures

Measure 3.6-1a-HVPL: EBMUD will prepare a map of the District's ROWs indicating the trees to be removed and retained (preserved). Prior to the start of any clearing, stockpiling, excavation, grading, compaction, paving, change in ground elevation, or construction, retained trees that are adjacent to or within project construction areas will be identified and clearly marked. Construction fencing will be installed at the edge of the District's ROWs and/or adjacent delineated construction areas as appropriate to reduce soil compaction and injury to adjacent preserved trees.

Excavation adjacent to any trees will be performed in a manner that minimizes root damage (e.g. providing clean cuts of tree roots). See also Measure 3.6-1b-HVPL and 3.6-1c below.

Measure 3.6-1b-HVPL: All pruning and root cutting of preserved trees will be performed by a certified arborist. No more than 25 percent of a tree's canopy will be removed. Tree replacement will adhere to the following guidelines:

- If any protected tree native to the local area, such as valley oak and coast live oak, is removed, the District will replace it on a 3:1 basis with native trees of the same species as those removed.
- All non-native protected trees which are removed will be replaced a 1:1 ratio with a non-invasive tree species.
- Non-native trees removed from a natural environment will be replaced with a native species that occurs in the area.
- Replacement trees will be planted at ecologically appropriate sites or on EBMUD watershed lands.
- In lieu of tree replacement, the District will fund riparian or upland restoration work by a local creek group such as Friends of Orinda Creeks or San Pablo Watershed Neighbors Education and Restoration Society for the purposes of compensating for tree loss associated with the project. In-lieu restoration work would be appropriate where restoration activities would provide greater benefit to protected trees than tree replacement. For example, restoration may be preferable where there are opportunities to preserve existing mature trees that are threatened by disease or removal, or if sufficient suitable land (in terms of exposure, soil type, etc.) for tree replacement is not identified within the San Pablo Creek watershed. Examples of appropriate restoration work include invasive plant removal and replanting of native tree species to improve the habitat value of the San Pablo Creek watershed, and improving tree health through pruning or fertilizing or other actions to reduce exposure or risk of sudden oak death. The funded restoration work must provide habitat benefits commensurable with that lost through the removal of trees.

Impact 3.6-2: Degradation to streams, wetlands, and riparian habitats potentially subject to state and federal protection during construction.

Construction of the proposed project has the potential to impact aquatic and riparian habitat associated with Lauterwasser Creek. Within the creek banks and across Lauterwasser Creek, the pipeline would be placed underground through hand excavation of an open trench. Open trenching would result in direct impacts to Lauterwasser Creek and its riparian habitat. In addition, impacts to Lauterwasser Creek could occur if oil, gas, or other contaminants used for pipeline construction seeps into the creek or if groundwater disturbance results in erosion and increased siltation into the creek. Increased siltation has the potential to occur, particularly during the rainy season, because the creek banks are already quite incised. Direct and indirect impacts to Lauterwasser Creek would be potentially significant. These impacts would be reduced to a less than significant level with implementation of Measures 3.6-2c and 3.6-2f, as revised below and presented in Appendix A.

Mitigation Measures

Measure 3.6-2c-HVPL: If impacts to potentially jurisdictional features and associated riparian vegetation cannot be avoided or minimized, then the District will obtain a qualified biologist to complete a wetland delineation in accordance with Corps guidelines and will obtain the appropriate permits/agreements, including a Section 404 wetland permit from the Corps, a Section 401, water quality certification from the RWQCB, and/or a Section 1602 Streambed Alteration Agreement from the CDFG. The District will implement all conditions contained in these permits. The District will recontour and revegetate temporarily disturbed portions of the creek. The District will develop and implement a five-year monitoring program.

Appropriate performance standards may include, but are not limited to: a 75 percent survival rate for restoration plantings; absence of non-native, invasive plant species; and a functioning, self-sustaining creek or wetland system at the end of five years.

Interim measures to protect the unvegetated creek from erosion may be required. Interim measures may include installing biodegradable erosion control mats, where appropriate.

Measure 3.6-2f-HVPL: The District will implement the following measures:

- Ensure that work activities at creeks are completed during the low-flow period (between April 1 and October 15), unless otherwise approved by appropriate regulatory agencies (e.g., RWQCB, Corps, CDFG).

- Store equipment and materials away from waterways to the extent feasible as determined by the District. 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 creeks. Maintenance and fueling will be conducted away from the creek.

- To control erosion on the banks of the creek, install silt fencing material along the edges of the District's ROWs and/or adjacent delineated construction areas.

- Minimize the removal of riparian and wetland vegetation.

Impact 3.6-3: Loss or damage to special-status plants and sensitive natural communities.

Special-status plants such as big-scale balsamroot, Mt. Diablo fairy-lantern, Diablo rock-rose, western leatherwood, and Northern California black walnut could be present in the undeveloped habitat on either side of Lauterwasser Creek. In addition, coast live oak – valley oak woodland, a sensitive natural community, is present south of Lauterwasser Creek and surrounding the proposed staging area at the pumping plant site. These species and community would be adversely affected if they are present where open trenching, staging, or access roads are proposed.

Potential impacts to special-status plants and sensitive natural communities would be less than significant with implementation of Measures 3.6-3a and 3.6-3c (see Appendix A), and Measure 3.6-3b, as revised below.

Mitigation Measure

Measure 3.6-3b-HVPL: In the event that nonlisted special-status plant species or sensitive plant communities are present or assumed present within or immediately adjacent to the limits of construction, the District will avoid these species or sensitive plant communities and establish a visible buffer zone prior to construction, in coordination with a qualified biologist, or will redesign or relocate the proposed structure and/or staging area. If the District determines that it is not feasible to avoid disturbance or mortality, then special-status plant habitat and/or sensitive plant communities will be restored at a 1:1 ratio. If feasible, special-status plants will be salvaged. A five-year restoration mitigation and monitoring program will be developed and implemented. Appropriate performance standards may include, but are not limited to: a 75 percent survival rate of restoration plantings or plant cover; absence of invasive plant species; and a functioning, self-sustainable plant community at the end of five years.

Impact 3.6-4: Disturbance to nesting raptors or other special-status nesting birds.

Birds may nest in any of the trees or structures along the pipeline alignment. If present, they could be adversely affected through direct nest tree removal, or by nearby project-related noise and vibration that results in reduced nesting success. Implementation of Measure 3.6-4a, as revised below, would reduce this impact to a less-than-significant level.

Mitigation Measure

Measure 3.6-4a-HVPL: EBMUD will avoid disturbing active nests of raptors and other special-status nesting birds by performing preconstruction surveys and creating no-disturbance buffers.

If construction activities (i.e., ground clearing and grading, including removal of trees or shrubs) are scheduled to occur during the nonbreeding season (September 1 through January 31), no mitigation is required.

If construction activities are scheduled to occur during the breeding season (February 1 through August 31), EBMUD will implement the following measures to avoid potential adverse effects on nesting raptors and other special-status birds:

- EBMUD will 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, EBMUD will 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. The size of these buffer zones and types of construction activities restricted in these areas will be established during construction in consultation with the CDFG and will be based on existing noise and human disturbance levels at each WTTIP project site. Nests initiated during construction are presumed to be unaffected, and no buffer would be necessary. However, the "take" of any individuals will be prohibited.

- If preconstruction surveys indicate that nests are inactive or potential habitat is unoccupied during the construction period, no further mitigation is required. Trees and shrubs within the construction footprint that have been determined to be unoccupied by special-status birds or that are located outside the no-disturbance buffer for active nests may be removed.

Impact 3.6-6: Adverse effects to San Francisco dusky-footed woodrat.

While no woodrat nests were observed in the proposed pipeline alignment, it is possible that they are present in the undeveloped habitat north of Lauterwasser Creek and were overlooked, or that they will be built in the alignment prior to project construction. Implementation of Measure 3.6-6, as revised below, would reduce this impact to a less-than-significant level.

Mitigation Measure

Measure 3.6-6-HVPL: EBMUD will avoid disturbance to San Francisco dusky-footed woodrat by performing preconstruction surveys.

Not more than two weeks prior to construction, a qualified wildlife biologist will conduct a preconstruction survey to identify woodrat nests within 10 feet of proposed ground disturbance. A qualified wildlife biologist will conduct additional surveys periodically throughout the duration of construction activities to identify newly constructed woodrat nests. If woodrat nests can be avoided by project activities, the qualified biologist would demarcate suitable buffer areas for avoidance. If woodrat nests are located within areas proposed for construction, nest relocation would be implemented.

For active woodrat nests found within 10 feet of proposed disturbance areas that cannot be avoided, understory vegetation would first be cleared from around the nest. Next, the

wildlife biologist would disturb the nest and allow all woodrats to leave the nest. The site will be re-examined 72 hours later to establish that the woodrats have abandoned the site.

Impact 3.6-7: Adverse effects to special-status aquatic species habitat.

While no special-status aquatic species were observed within the pipeline alignment, Lauterwasser Creek may provide habitat for California red-legged frog and western pond turtle. If present, these species could be impacted if they are injured or killed by construction equipment, if they become trapped in a trench or other portion of the project area, or if their habitat becomes unsuitable due to project-related siltation or contamination. Implementation of Measures 3.6-7a and 3.6-7b, as revised below, and WTTIP EIR Measure 3.6-7c, as presented in Appendix A, would reduce this impact to a less-than-significant level.

Mitigation Measures

Measure 3.6-7a-HVPL: EBMUD will avoid disturbing aquatic species and associated habitats.

Implementation of Measures 3.5-1a and b, 3.5-3, and 3.5-6 (see Section 3.5, Hydrology and Water Quality), as well as best management practices (BMPs) for construction activities, would reduce potential impacts to aquatic species and habitat resulting from sedimentation, turbidity, and hazardous materials. Specific measures aimed at protecting aquatic species include:

- Construction activities within and adjacent to aquatic and riparian habitats will be monitored by a qualified biologist. The biologist will survey the work area for sensitive resources prior to the start of construction each day and monitor identified biological resources during construction activities, such as initial clearing and grading, installation of silt fencing, pipeline trench excavation, and backfilling and compaction.

- Water from around the section of the worksite that is within the actively flowing channel of Lauterwasser Creek will be diverted past the construction site. This diversion will reduce the potential for sediment or other pollutants to enter the waterways and affect downstream resources. The diversion will be installed so as to capture water from the existing outlet structure and release the diverted water downstream of the construction site.

- Sediment curtains will be placed downstream of the construction or maintenance zone to prevent sediment disturbed during trenching activities from being transported and deposited outside of the construction zone.

- If groundwater is encountered, or if water remains within the worksite after flows are diverted, it will be pumped out of the construction area and into a retention basin constructed of hay bales lined with filter fabric. The pump(s) will be screened to avoid entrapment of aquatic species.

- Silt fencing will be installed in all areas where construction occurs within 100 feet of actively flowing water.

- A spill prevention plan for potentially hazardous materials will be prepared and implemented. The plan will include the proper handling and storage of all potentially hazardous materials, as well as the proper procedures for cleaning up and reporting any spills. If necessary, containment berms will be constructed to prevent spilled materials from reaching the creek channels.

- Equipment and materials will be stored at least 50 feet from waterways. No debris (such as trash and spoils) will be deposited within 100 feet of wetlands. Staging and storage areas for equipment, materials, fuels, lubricants, and solvents will be located outside of the stream channel and banks and be limited to the smallest size feasible as determined by EBMUD. Stationary equipment such as motors, pumps, generators, compressors, and welders located within or adjacent to the stream will be positioned over drip pans. Any equipment or vehicles driven and/or operated within or adjacent to the stream will be checked and maintained daily to prevent leaks of materials that, if introduced to water, could be deleterious to aquatic life. Vehicles will be moved away from the stream prior to refueling and lubrication.

- Proper and timely maintenance of vehicles and equipment will be performed to reduce the potential for mechanical breakdowns that could lead to a spill of materials into or around creeks. Maintenance and fueling will be conducted at least 75 feet from riparian or aquatic habitat.

Measure 3.6-7b-HVPL: EBMUD will avoid disturbing California red-legged frog and its habitat.

To prevent impacts to California red-legged frog during and after construction adjacent to Lauterwasser Creek in the District's ROWs, reasonable and prudent measures for protection of California red-legged frog from the USFWS Biological Opinion for this species (USFWS, 1999), as well as any additional protection measures developed through informal consultation with the USFWS, will be implemented. These measures include environmental training, construction equipment and materials storage guidelines, silt fencing, and revegetation, as described in Measure 3.6-7a, as well as the following measures:

- The name and credentials of a biologist qualified to act as a project biologist/ construction monitor will be submitted to USFWS for approval at least 15 days prior to the commencement of work.

- A USFWS-approved biologist will survey the worksite two weeks before the onset of construction activities. If California red-legged frogs, tadpoles, or eggs are found, the approved biologist will contact the USFWS to determine if moving any of these life-stages is appropriate. If the USFWS approves moving the animals, the biologist will be allowed sufficient time to move frogs from the worksite before work activities begin. If California red-legged frogs are not identified, construction may proceed at these sites.

- Exclusion fencing will be installed at the edge of the District's ROWs and/or adjacent delineated construction areas, as directed by the USFWS, to prevent California red-legged frogs in adjacent areas from moving into project work areas.

- In the event that a California red-legged frog is encountered in a construction area and does not leave of its own accord, work shall be stopped in the immediate area. The USFWS will be contacted for approval before the animal is relocated.

- A USFWS-approved biologist will be present at the active worksites until such time that the removal of California red-legged frogs, instruction of workers, and natural habitat disturbance have been completed. After this time, the contractor or permittee will designate a person to monitor onsite compliance with minimization measures. The biologist will ensure that this individual receives training outlined in the programmatic Biological Opinion. (see also Measure 3.6-9-HVPL)

- During work activities, trash that may attract predators will be properly contained, removed from the worksite, and disposed of regularly. Following construction, trash and construction debris will be removed from work areas.

- Work activities within or adjacent to potential California red-legged frog aquatic habitat will be completed between April 1 and November 1.

- The USFWS-approved biologist will remove exotic species, such as crayfish and centarchid fish, from the project area.

Should the USFWS determine through informal consultation that formal consultation is necessary, EBMUD will prepare a biological assessment and initiate formal consultation with the USFWS under Section 7 of FESA. Any additional California red-legged frog protection measures and additional habitat compensation required for program-level project impacts included in the USFWS Biological Opinion will be implemented during and after construction, as applicable.

Impact 3.6-9-HVPL: Adverse effects to Alameda whipsnake.

No Alameda whipsnakes were observed during herpetologist Karen Swaim's 2010 habitat assessment, and habitat in the project area is generally unsuitable for this species (Swaim, 2010). However because there is high quality core habitat for the Alameda whipsnake nearby, it is possible for this species to disperse through the project area. If present in the project area during construction activities, this species could be injured or killed by construction equipment, trapped in open trenches, or otherwise impacted by a temporary loss of foraging or dispersal habitat. Under Section 7 of the Endangered Species Act, the project applicant shall obtain a Biological Opinion from the U.S. Fish and Wildlife Service (USFWS), which shall make the determination whether or not the proposed project would jeopardize the Alameda whipsnake.

The following measures shall be implemented to reduce potential impacts on the Alameda whipsnake to a less-than-significant level. Any additional measures included in the USFWS Biological Opinion shall be implemented, as applicable.

Mitigation Measure

Measure 3.6-9-HVPL: To avoid and minimize take of the Alameda whipsnake, the District will implement the following measures within the District's ROWs within the riparian habitat of Lauterwasser Creek and adjacent upland habitat:

(1) Trenches with a depth of one foot or greater that are left open overnight will be equipped with ramps every 150 feet, to allow any animals that get in the trench to

escape. The ramps will be constructed of dirt fill, wood planking, or other suitable materials placed at an angle of no greater than 30 degrees.

(2) No plastic monofilament will be used for erosion control or other purposes, as Alameda whipsnakes and other wildlife may become entangled in it. Jute netting or other suitable replacement will be used instead.

(3) The U.S. Fish and Wildlife Service approved biologist (see Measure 3.6-7b) will conduct a worker education session for all workers, to include the natural history of Alameda whipsnake and California red-legged frog, measures required to avoid harm to the species, and penalties associated with enforcement of the California Endangered Species Act and federal Endangered Species Act.

(4) In the event that an Alameda whipsnake is encountered in a construction area and does not leave of its own accord, work shall be stopped in the immediate area. The USFWS will be contacted for approval before the animal is relocated.

3.2.6 Cultural Resources

Existing Cultural Resources

The majority of the Happy Valley Pipeline alignment would be constructed within City of Orinda public streets through a predominantly single-family residential neighborhood. The alignment also includes a cross-country segment that traverses a ravine and Lauterwasser Creek within two existing District right-of-ways (ROW 660 and 666) between Miner Road and Van Ripper Lane. The following provides the results of an updated record search, pedestrian survey of the cross-country segment, and updated Native American contact.

Updated Records Search

A records search at the Northwest Information Center of the California Historical Resources Information System at Sonoma State University was completed on June 14, 2010 (File No. 10-0074). The purpose of the records search was to determine whether known archaeological resources have been recorded within or adjacent to the project area since the original records search was completed for the WTTIP EIR in October 2005 and assess the likelihood for unrecorded cultural resources to be present based on historical references and the distribution of nearby sites.

The review included the project area and a ½-mile radius. Previous surveys, studies, and site records were accessed. Records were also reviewed in the Historic Property Data File for Contra Costa County that contains information on sites of recognized historical significance including those evaluated for listing in the National Register of Historic Places, the California Register of Historical Resources, the California Inventory of Historical Resources, California Historical Landmarks, and California Points of Historical Interest.

The records search indicates that no cultural resources studies or previously recorded cultural resources have been identified within the project area. One prehistoric archaeological site is located within a ½-mile radius of the project area. CA-CCO-8 consists of two isolated lithic points found in a residential backyard approximately ½-mile from the project area (Starkman, n.d.). Four additional studies have been completed within ½ mile of the project area (Chavez, 1984; Holman, 1991; Holman, 1993; Jackson, 1977). No cultural resources were recorded during those studies.

Field Survey Methods and Results

On July 30, 2010, an ESA Registered Professional Archaeologist conducted an archaeological field survey of those portions of the project area that contained visible ground surface. The unpaved portion of the project area that crosses a ravine and Lauterwasser Creek between Miner Road and Van Ripper Lane was the subject of the field survey (paved areas along Miner road were not surveyed due to the lack of visibility of native ground surface). The District ROWs between Miner Road and Lauterwasser Creek had good ground visibility with limited ground covering; soil is a light to medium brown sandy loam. The banks of the ravine from Miner Road to Lauterwasser Creek are steep, extending approximately 30 feet down to the creek, and could not be safely traversed. On the north side of the creek, between Lauterwasser Creek and Van Ripper Lane, the project area is landscaped with imported fill and wood chips; native ground visibility was limited. Access was restricted by vegetation nearest to the ravine; however the ground is sloped and there is a steep 25–30-foot drop to the creek below. No archaeological features or artifacts were recorded within the project area.

The structures to either side of Miner Road in the project area (452 to 559 Miner Road), as well as 85-89 Van Ripper Lane, were also observed during the July 30, 2010 field survey. This reconnaissance level windshield survey indicated that these structures are entirely comprised of single-family Ranch Style homes, the majority of which were constructed from the 1940s through 1960s. A review of Contra Costa County tax assessor's information indicates that the oldest home in the project area was built in 1938 (555 Miner Road), while the newest home was constructed in 2005 (548 Miner Road), with the vast majority constructed from the mid-1950s to the early 1960s (Contra Costa County, 2010). These construction dates are reflective of the 1937 opening of the Caldecott Tunnel and the substantial amount of residential development which occurred in Orinda and elsewhere in Contra Costa County during the post-war period. As described above, no historic resources have been recorded in the immediate project vicinity. However, none of these homes have been evaluated for their potential historical or architectural significance. Single-family homes constructed prior to 1960 could be eligible for listing as historical resources due to their age (50 years old or older as of 2010, or pre-1960), but only if other significance criteria applied, such as associations with important historical events or individuals, or substantial architectural significance. Neither the records search nor the reconnaissance-level field survey indicated that any of the homes in the project vicinity appear to have associations with important historical events or individuals, or the appearance of substantial architectural significance. As such, no historic architectural resources are expected in the project area that could be affected by the proposed project.

Updated Native American Contact

On July 16, 2010, a sacred lands search request for the Area of Potential Affect (APE) was submitted to the Native American Heritage Commission (NAHC). The purpose of the Native American contact was to provide an update to the Native American contact completed for the WTTIP EIR in December, 2005, and obtain information about cultural resources which may exist in the in the project area. A response from the NAHC was received on July 21, 2010. The sacred lands file search did not indicate the presence of Native American cultural resources in the APE. The NAHC provided a list of Native American contacts that might have further knowledge of the vicinity with respect to cultural resources. Each person or organization identified by the NAHC was contacted by letter on July 21, 2010 to request input or concerns that the proposed project may pose to sites of cultural importance. No responses have been received as of this writing.

Impacts and Mitigation Measures

Significance Criteria

Consistent with the WTTIP EIR, the proposed project would cause a significant impact if it would result in:

- A substantial adverse change in the significance of a historical resource that is either listed or eligible for listing in the National Register of Historic Places, the California Register of Historical Resources, or a local register of historic resources;
- A substantial adverse change in the significance of a unique archaeological resource;
- Disturbance or destruction of a unique paleontological resource or site or unique geologic feature; or
- Disturbance of any human remains, including those interred outside of formal cemeteries.

Methodology

Based on the analysis provided in the WTTIP EIR, in conjunction with proposed changes in the location of the pipeline alignment, this analysis determined that the significance level for Impacts 3.7-1, 3.7-2, and 3.7-3 would not change.

- *Impact 3.7-1: Potential disturbance to archaeological resources, including unrecorded cultural resources.* No archaeological resources were located in the project area. It does not appear that the proposed project would impact cultural resources, including human remains, and no additional work regarding cultural resources is necessary at this time. In the event of an inadvertent discovery of cultural materials or human remains, implementation of WTTIP EIR Measure 3.7-1a (described in Appendix A) would still apply and would reduce this impact to a less-than-significant level.

- *Impact 3.7-2: Potential disturbance to paleontological resources.* It does not appear likely that paleontological resources are located in the vicinity of the project area however this possibility cannot be entirely discounted. In the event that paleontological resources are uncovered during project construction, implementation of WTTIP EIR Measure 3.7-2 (described in Appendix A) would still apply and would reduce this impact to a less-than-significant level.

- *Impact 3.7-3: Disturbance or Alteration to Historic resources.* The proposed project would have no significant impact to historic architectural resources either listed or eligible for listing in the National Register of Historic Places, the California Register of Historical Resources, or a local register of historic resources. Although a number of single-family Ranch Style homes along Miner Road were built from the late 1930s to the late 1950s, and are 50 years old or older as of 2010, and none of these homes have been evaluated for their potential historical or architectural significance, the records search and field survey indicates no associations with important historical events or individuals, or the appearance of substantial architectural significance. In addition, as the proposed pipeline would be constructed in the right-of-way and some distance from the homes (up to 100 feet away), no substantial direct or indirect impacts would occur to these homes as a result of the proposed project. Therefore, no impacts to historic architectural resources would occur.

3.2.7 Traffic and Circulation

Setting in Project Area

The proposed Happy Valley Pipeline alignment would be located in a predominantly residential area within the City of Orinda. The planned segments of the pipeline mainly traverse through local and curvilinear roadways, but also include a cross-country segment that traverses a ravine and Lauterwasser Creek, between Miner Road and Van Ripper Lane.

Existing Traffic Circulation Network

Area Roadways

Table 3.2.7-1 presents roadway characteristics (e.g., number of lanes, traffic volumes [where available], bike lanes, parking availability, transit service, etc.) for the local roadways that would be affected by the proposed pipeline alignment; **Table 3.2.7-2** presents more-detailed traffic volume data. Highway 24 provides regional access near the proposed pipeline alignment. This highway is an east-west freeway that connects the City of Oakland at the Interstate 580/980 interchange with cities east of the Caldecott Tunnel (e.g., City of Orinda) and I-680. The most recent data published by the California Department of Transportation (Caltrans) indicates the average daily traffic volume on Highway 24 in the project area is about 159,000 vehicles; trucks comprise about 3 percent of the daily traffic volume (Caltrans, 2009a, 2009b). Freeway ramps within the project area include those for Moraga Way / Camino Pablo, and St. Stephens Drive.

Transit Service

There is no regular daily public transit bus service on the roadways that would be affected by the proposed pipeline alignment, though the County Connection provides school bus service (Route 606) on Miner Road through the portion that would be closed during construction work hours (County Connection, 2010).[10] During the school year, Route 606 has four runs in the

[10] The County Connection Bus Line 126, which operated on Miner Road when the WTTIP EIR was published, was eliminated as part of service cuts in 2008.

TABLE 3.2.7-1
CHARACTERISTICS OF LOCAL ROADWAYS IN THE VICINITY OF PIPELINE ALIGNMENT

Roadway / Segment	No. of Lanes (width)	Traffic Volumes[a]	Bike Lanes?	On-Street Parking Permitted?	Public Transit Lines?[b]	Comments
Miner Road: ▪ Lombardy Lane to Brookbank Road ▪ Brookbank Road to Tiger Tail Court	2 lanes (21 feet) 2 lanes (21-24 feet)	950-1,060 vpd	No	No	No	Alternative access from El Nido Ranch Road and Highway 24 via Honey Hill Road and Charles Hill Road
Lombardy Lane: ▪ Miner Road to Van Ripper Lane	2 lanes (24 feet)	3,400-3,565 vpd	No	No	No	Not a through street, except via a Private Easement connection with Sundown Terrace.
Van Ripper Lane: ▪ Lombardy Lane to Lombardy Lane	2 lanes (20 feet)	N/A	No	Yes, but too narrow and low demand	No	Two intersections with Lombardy Lane provide alternate access options for residents.

[a] Average daily (two-way) traffic volumes over three days of continuous counting (Tuesday–Thursday, in both May and June 2007). These volumes remain representative of current traffic volumes, as conditions (land uses and activities) have not changed materially since 2007. Abbreviations: vpd= vehicles per day; N/A = not available.
[b] There is no public transit bus service on the roadways that would be affected by the proposed pipeline alignment, though the County Connection provides school bus service (Route 606) on Miner Road through the portion that would be closed during construction work hours.

SOURCE: ESA.

TABLE 3.2.7-2
EXISTING TRAFFIC VOLUMES ON AREA ROADWAYS

	Average	Average (Highest) Volume Per Hour[b]		
Roadway	Daily Traffic (Total)[a]	7:00 a.m. to 9:00 a.m.	9:00 a.m. to 4:00 p.m.	4:00 p.m. to 6:00 p.m.
Lombardy Lane north of Tarry Lane				
(Schools in session) May	3,400	265 (295)	220 (295)	285 (315)
(Schools not in session) June	3,565	220 (275)	245 (290)	280 (410)
Miner Road east of Brookbank Road				
(Schools in session) May	955	90 (105)	60 (90)	75 (85)
(Schools not in session) June	1,060	65 (90)	80 (135)	85 (105)

[a] Average daily (two-way) traffic over three days of continuous counting (Tuesday–Thursday, in both May and June 2007).
[b] The first number equals the average hourly (two-way) volume over the time period, and the second number (in parentheses) equals the highest hourly (two-way) volume counted on the three survey days.

SOURCE: ESA.

morning (the last one at about 8:00 a.m.), and multiple buses make two runs in the afternoon (3:20 and 3:42 p.m. on Mondays, and 3:42 and 4:04 p.m. other weekdays).[11]

Bikeways/Pedestrian Circulation

There are no bicycle routes on the roadways that would be affected by the proposed pipeline alignment. The level of pedestrian facilities (e.g., sidewalks versus edge-of-road paths) and pedestrian volumes varies in the project area, but the predominant travel mode in the area is by automobile. On residential streets, sporadic pedestrian flows (e.g., dog walking, jogging, etc.) occur.

Traffic Flow Conditions

The theoretical daily carrying capacity (i.e., the highest traffic volume that can travel on a roadway in a day) is about 15,000 vehicles for a two-lane road. The theoretical hourly carrying capacity is generally 10 percent of the daily capacity. Both Miner Road and Lombardy Lane carry traffic volumes that are lower than their theoretical capacities (see Tables 3.2.7-1 and 3.2.7-2). Traffic volumes have been observed to be lower on Van Ripper Lane than on Miner Road and Lombardy Lane.

Impacts and Mitigation Measures

Significance Criteria

Consistent with the WTTIP EIR, a project that would cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system is considered to have a significant impact on the environment. A project is also considered to have a potentially significant impact if:

- Traffic generated by construction workers and construction vehicular activities substantially affects roadway traffic flow, especially during peak traffic hours;
- Construction substantially affects parking availability, causing traffic safety/operational problems;
- Construction activities pose a traffic safety hazard to motor vehicles, bicyclists, or pedestrians;
- Construction activities significantly affect local transit service; or
- Movement of heavy vehicles causes substantial damage or wear of public roadways.

The proposed project would not cause long-term effects because the various project facilities, once installed, would only require maintenance activities similar to those that occur under existing conditions. The duration of the potential significant impacts would be limited to the

[11] According to the County Connection 2010 timetable for Bus Route 606, a total of three buses operate along the route simultaneously, and on identical headways during the afternoon hours.

period of time needed to construct the project. Therefore, mitigation measures for traffic-related impacts identified in this SEIR focus on reducing construction-phase project effects.

Methodology

The estimated maximum daily and hourly trip generation (short-term increases in vehicle trips by construction workers and construction vehicles on area roadways) associated with the proposed project is the same as described under Impact 3.8-1 in the WTTIP EIR; see Table 2-2 (Trip Generation Estimate – WTTIP EIR-Analyzed Happy Valley Pipeline project) and Table 2-4 (Trip Generation Estimate – Proposed Happy Valley Pipeline Project) in this SEIR. In addition, the WTTIP EIR analysis of impacts associated with project construction assumed that there would be sufficient pavement outside the construction work zone to maintain alternate one-way traffic flow during construction in Lombardy Lane in the vicinity of its easterly (four-legged) intersection with Van Ripper Lane. Potential traffic and circulation impacts described in the WTTIP EIR would not change for activities associated with project construction on Lombardy Lane at Van Ripper Lane.

The District has determined (as a result of refinements made to design and construction assumptions) that the construction corridor needed for pipeline installation for the Happy Valley Pipeline project would use road segments of Miner Road between Lombardy Lane and Tiger Tail Court, and of Van Ripper Lane between its two intersections with Lombardy Lane (as well as the use of Miner Road as the staging area for cross-country pipeline installation between Miner Road and Van Ripper Lane). The WTTIP EIR did not assume that either Miner Road east of Lombardy Lane, or Van Ripper Lane would be used for installation of the pipeline to the Happy Valley Pumping Plant. Consequently, consistent with the *CEQA Guidelines*, EBMUD has prepared this analysis to address the proposed modification to construction of the Happy Valley Pipeline project, in a manner consistent with the WTTIP EIR.

Impacts and Mitigation Measures

Impact 3.8-1: Short-term increases in vehicle trips by construction workers and construction vehicles.

As stated above, the estimated maximum daily and hourly trip generation (short-term increases in vehicle trips by construction workers and construction vehicles on area roadways) associated with the proposed project is the same as described under Impact 3.8-1 in the WTTIP EIR. As described in the WTTIP EIR for similar trip generation on roads similar to those affected by the current project, project-generated truck trips would be dispersed throughout the day, and although drivers could experience delays if they were traveling behind a construction truck, the level of project traffic on area roads would be low. Traffic volume increases caused by project construction would be most noticeable on the local roadways used to access work sites along the alternative pipeline alignments (i.e., Lombardy Lane, Miner Road, and Van Ripper Lane). Although project-generated trips on these local-serving roadways would represent a higher (more noticeable) percent increase in daily traffic volumes, the effect on traffic flow would be less than significant because the traffic volumes would remain at levels clearly less than the carrying capacity of the roads (which, as described above, is about 15,000 vehicles per day on two-lane roads).

Implementation of WTTIP EIR Measure 3.8-1, as revised below, would ensure that the impact from increased traffic volumes would be less than significant.

Mitigation Measure

Measure 3.8-1-HVPL: The following requirements will be incorporated into contract specifications for the proposed project:

- The District or contractor(s) will obtain any necessary road encroachment permits prior to construction and will comply with conditions of approval attached to project implementation. As part of the road encroachment permit process, the District or contractor(s) will submit a traffic safety / traffic management plan (for work in the public right-of-way) to the City of Orinda. Elements of the plan will likely include, but are not necessarily limited to, the following:

  – 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.

  – 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).

  – Coordinate with the County Connection so the transit provider can temporarily relocate or reconfigure 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.

Impact 3.8-2: Reduction in the number of, or the available width of, travel lanes on roads where pipeline construction would occur, resulting in short-term traffic delays for vehicles traveling past the construction zones.

As noted in Chapter 2, Description of the Proposed Project, access to closed sections on Miner Road and on Van Ripper Lane would only be allowed for residents of the affected portions of these roadways and emergency vehicles. As construction proceeds along these roadways, affected segments would be closed. Once construction of a segment is completed, access to that segment would be restored. After the entire pipeline is constructed and tested, the affected portions of the roadway will be paved.

As described above, the WTTIP EIR analysis of impacts associated with project construction assumed that there would be sufficient pavement outside the construction work zone to maintain alternate one-way traffic flow during construction in Lombardy Lane in the vicinity of its easterly (four-legged) intersection with Van Ripper Lane. As such, potential traffic and circulation impacts associated with that reduction in the number of travel lanes on Lombardy Lane at Van Ripper Lane are unchanged from those described in the WTTIP EIR.

The impact of the road closure would be that motorists who otherwise would travel through the closed segment(s), averaging as many as 85 vehicles per hour, would be detoured onto alternate roads/routes during the affected hours of the day. The detour route for motorists otherwise on Miner Road could be on the following two possible combinations of two-lane roads (described in one direction of travel, but also applicable for travel in the opposite direction): (1) Camino Sobrante (which intersects Miner Road about 0.1 mile south of the Miner Road / Lombardy Lane intersection) to La Espiral Road to Las Vegas Road to Via Las Cruces and then to Honey Hill Road, which becomes Miner Road; and (2) St. Stephens Drive (from Highway 24) to Via Las Cruces and then to Honey Hill Road (see Figure 2-4 in Chapter 2 of this SEIR). Although project-generated detoured vehicles would represent a noticeable increase in traffic volumes on these local roads, the effect on traffic flow would be less than significant because the traffic volumes would remain at levels clearly less than the carrying capacity of the roads (which, as described above, is about 15,000 vehicles per day on two-lane roads). Motorists wishing to turn onto Van Ripper Lane from Lombardy Lane would be directed to use the westerly intersection of Lombardy Lane and Van Ripper Lane. Advance notification and detour information signage would be used to alert motorists of the road closure and alternate routing possibilities.

Consistent with the WTTIP EIR Mitigation Monitoring and Reporting Plan, the District would retain a traffic consultant to prepare a traffic control plan for construction work of the Happy Valley Pipeline project in the public right-of-way. The Traffic Control Plan will include the following:

- Circulation and detour plans

- Location of road closure points and turn-around points
- Specific measures for controlling traffic on detour routes (e.g., flaggers, signage)

With implementation of WTTIP EIR Measure 3.8-1, as revised above (and further by the above-cited traffic control plan), this impact would be reduced to a less-than-significant level.

Mitigation Measure

Measure 3.8-2-HVPL: Implement Measure 3.8-1-HVPL, which stipulates actions required of contractor(s) to reduce traffic flow impacts to a less-than-significant level.

Impact 3.8-3: Demand for parking spaces to accommodate construction worker vehicles; temporary displacement of on-street parking along pipeline alignment routes.

As stated above, the estimated maximum daily and hourly trip generation (short-term increases in vehicle trips by construction workers and construction vehicles on area roadways) associated with the proposed project is the same as described under Impact 3.8-1 in the WTTIP EIR. Potential parking impacts (associated with the number of construction workers, plus supervisory, inspection and visitor personnel) would not change from impacts described in the WTTIP EIR, although the location(s) [i.e., streets] where parking demand would be accommodated would differ for the proposed project. Given that Miner Road and Van Ripper Lane would be closed to through traffic during construction hours, it is likely that construction workers and other personnel would park within the construction zone on the affected road. Implementation of Measure 3.8-1-HVPL, which requires that contractor(s) 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), would ensure that the impact from temporary parking demand would be less than significant.

Mitigation Measure

Measure 3.8-3-HVPL: Implement Measure 3.8-1-HVPL, which stipulates actions required of contractor(s) to reduce parking impacts to a less-than-significant level.

Impact 3.8-4: Potential traffic safety hazards for vehicles, bicyclists, and pedestrians on public roadways.

Construction-generated trucks on project area roadways, as well as increased traffic on detour routes, would interact with other vehicles, increasing potential conflicts between the added traffic and bicyclists and pedestrians. However, the proposed project would neither change the physical characteristics of the roads used as detour routes, nor detour traffic that is incompatible with existing traffic patterns. As a result, safety hazards associated with project traffic would result in a potentially significant impact.

Mitigation Measure

Measure 3.8-4-HVPL: Implement Measure 3.8-1-HVPL, which stipulates actions required of contractor(s) to reduce potential traffic safety impacts to a less-than-significant level.

Impact 3.8-5: Access disruption to adjacent land uses and streets for both general traffic and emergency vehicles, as well as disruption to bicycle/pedestrian access and circulation.

Closure of Miner Road (between Lombardy Lane and Tiger Tail Court) and Van Ripper Lane (between Lombardy Lane and the point where the EBMUD ROW intersects between 85 and 89 Van Ripper Lane) during the construction work hours of 9:00 a.m. to 9:00 p.m. on weekdays, and of Miner Road (as staging for the District ROW pipeline installation between Miner Road and Van Ripper Lane)during construction work hours of 8:00 a.m. to 6:00 p.m. on weekdays, would restrict access to those stretches of road to emergency vehicles and residents of the affected portion of the roads. Construction-phase detours would allow continued access to adjacent communities throughout the construction period. This would be an inconvenience to those motorists whose trips would last longer. Outside of work hours, the work areas would be covered and vehicle access would be restored. With sufficient advance notification, this short-term inconvenience would result in a less-than-significant impact.

Mitigation Measure

> **Measure 3.8-5-HVPL:** Measure 3.8-1-HVPL, which stipulates actions required of contractor(s) to reduce access impacts to a less-than-significant level.

Impact 3.8-6: Disruptions to transit service on pipeline alignment routes.

There is no regular daily public transit bus service on the roadways that would be affected by the proposed pipeline alignment, though the County Connection provides school bus service (Route 606) on Miner Road through the portion that would be closed during construction work hours, with four runs in the morning (the last one at about 8:00 a.m.), and multiple buses making two runs in the afternoon (3:20 and 3:42 p.m. on Mondays, and 3:42 and 4:04 p.m. other weekdays).

Road closure during the hours the school bus service is provided would displace that bus line. However, as stated in Chapter 2, Description of the Proposed Project, project construction is expected to be completed in the summer of 2013 during the school vacation period when the school bus service does not operate. Therefore, no disruption of school bus service along Miner Road would occur, and this impact would be less than significant.

Impact 3.8-7: Increased wear-and-tear on the designated haul routes used by construction vehicles.

The use of large trucks to transport equipment and material to and from the project worksites could affect road conditions on the designated haul routes by increasing the rate of roadwear. The degree to which this impact would occur depends on the roadway design (pavement type and thickness) and the existing condition of the roads that the construction trucks would use. Residential streets such as Miner Road and Van Ripper Lane are generally not built to withstand substantial truck traffic volumes. Therefore, excessive roadwear due to project construction trucks could significantly impact local roadways. Implementation of WTTIP EIR Measure 3.8-7

(described in Appendix A) would ensure that the impact from increased traffic volumes would be less than significant.

3.2.8 Air Quality

Environmental Setting

Sensitive Receptors

Sensitive receptors located in the project area consist of residential uses located adjacent to Miner Road and Van Ripper Lane. Sleepy Hollow Elementary School is located over one-half mile from the project area and would not be affected by project construction.

Air Quality Regulations

Federal and State Policies and Regulations Related to Criteria Pollutants

Federal and state air quality standards, attainment status, air quality planning efforts, and pertinent regulations as described in the WTTIP EIR are incorporated herein by reference (see WTTIP EIR pp. 3.9-1 to 3.9-6). However, since adoption of the WTTIP EIR, the state air quality plan was updated and in January 2006, the Bay Area Air Quality Management District (BAAQMD), in cooperation with the Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG), adopted the *Bay Area 2005 Ozone Strategy.* The Ozone Strategy was a roadmap showing how the San Francisco Bay Area will achieve compliance with the state 1-hour ozone standard as expeditiously as practicable, and how the region will reduce transport of ozone and ozone precursors to neighboring air basins. The control strategy includes stationary-source control measures to be implemented through BAAQMD regulations; mobile-source control measures to be implemented through incentive programs and other activities; and transportation control measures to be implemented through transportation programs in cooperation with the MTC, local governments, transit agencies, and others. While the *2005 Ozone Strategy* replaced the *2000 Clean Air Plan (CAP),* it continued to implement and expand key mobile-source emissions controls, including 19 transportation control measures. However, *2005 Ozone Strategy* is now being updated by the draft *2010 CAP,* which was released in March 2010 and adoption is expected in fall 2010. The *2010 CAP* also provides a control strategy to reduce ozone, particulate matter (PM), air toxics, and greenhouse gases (GHGs) in a single, integrated plan.

The *2010 CAP* is a multi-pollutant, risk-based "one atmosphere" approach that considers co-benefits (or impacts) across the full spectrum of pollutants. The draft *2010 CAP* contains 55 control measures designed to improve air quality, protect public health and reduce combustion-related GHG emissions. The broader scope of the CAP allows for the inclusion of a wide array of BAAQMD initiatives (climate protection, wood smoke abatement, air toxics, etc.) into the planning process rather than focusing on ozone alone. The public comment period on the draft *CAP* and the associated DEIR ends on August 26, 2010, and a public hearing for plan adoption is scheduled for September 15, 2010.

Ambient Air Quality

BAAQMD air pollutant monitoring data for 1999 through 2004 were presented in the WTTIP EIR. Since completion of the EIR, monitoring data for 2005 through 2009 have become available and measured pollutant data are within the range listed in Table 3.9.2 of the WTTIP EIR. As shown in **Table 3.2.8-1**, the range of standard exceedances for ozone and PM_{10} have remained approximately the same with these five additional years of data, while carbon monoxide and $PM_{2.5}$ levels have declined. However, the number of exceedances for $PM_{2.5}$ have increased because the federal standard was lowered in 2006.

Impacts and Mitigation Measures

Significance Criteria

For the purposes of this analysis, the proposed project would result in a significant impact if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

Methodology

Based on the analysis provided in the WTTIP EIR in conjunction with proposed changes in the location and construction methods associated with the proposed project, this analysis recognizes that many of the potential air quality impacts associated with the proposed project would not change.

The adoption of the BAAQMD CEQA Guidelines and new significance thresholds as well as proposed changes in construction methods for the proposed project could, however, result in new temporary air quality impacts in addition to those already identified in the WTTIP EIR under Impacts 3.9-1 and 3.9-2. These new impacts are included in this document under the Impacts and Mitigation Measures heading, below. Construction and operational air emissions are evaluated in accordance with the 2010 BAAQMD CEQA Guidelines for assessing and mitigating air quality impacts, which were adopted on June 2, 2010 (BAAQMD, 2010). The BAAQMD indicates all of the CEQA thresholds of significance that were adopted as part of the Guidelines became effective on June 2, 2010 except for the new risks and hazards thresholds, which become effective on January 1, 2011. It is the BAAQMD policy that the adopted thresholds apply to projects for

TABLE 3.2.8-1
LOCAL AMBIENT AIR QUALITY MONITORING SUMMARY (2005-2009)

Monitoring Station & Pollutant	Most Stringent Applicable Standard	Number of Days Standards were Exceeded and Maximum Concentrations Measured				
		2005	2006	2007	2008	2009
Oakland Data						
Ozone (O_3)						
- Days 1-hour standard exceeded	>0.09 ppm[1]	0	0*	0	0	0
- Maximum 1-hour (ppm)		0.07	0.09*	0.04	0.09	0.09
- Days 8-hour standard exceeded	>0.07 ppm[1]	0	0*	0	0	0
- Maximum 8-hour (ppm)		0.04	0.07*	0.04	0.06	0.06
Carbon Monoxide						
- Days 1-hour standard exceeded	>20 ppm[1]	0	0*	0	0	0
- Maximum 1-hour (ppm)		3.4	1.7**	2.9	NA	NA
- Days 8-hour standard exceeded	>9 ppm[1]	0	0**	0*	0	0
- Maximum 8-hour (ppm)		2.4	1.3**	1.4	1.6	2.0
Concord Data						
Suspended Particulates (PM_{10})						
- Maximum 24-hour ($\mu g/m^3$)	>50 $\mu g/m^3$ [1,3]	42	**81**	**52**	**51**	33
- Estimated Days 24-hour standard exceeded		NA	18	12	6	0
Suspended Particulates ($PM_{2.5}$)						
- Maximum 24-hour ($\mu g/m^3$)	>35 $\mu g/m^3$ [2,4]	**49**	**62**	**47**	**60**	**39**
- Days 24-hour standard exceeded		5	6	7	7	1
- Annual average ($\mu g/m^3$)	>12 $\mu g/m^3$ [1]	9.3	10.0	8.7	9.3	8.3

NOTES: **Bold** values are in excess of applicable standard, "ND" indicates that no data available, ppm = parts per million, $\mu g/m^3$ = micrograms per cubic meter

* Data from San Leandro during 2006 (no data available from Oakland Station for 2006)
** Data from Concord station during downtown Oakland station closure
1 State standard, not to be exceeded.
2 Federal standard, not to be exceeded.
3 Since PM_{10} is only sampled every sixth day, actual days over the standard can be estimated to be six times the number shown.
4 Standard reduced from 65 $\mu g/m^3$ to 35 $\mu g/m^3$ in 2006.

SOURCE: CARB, 2005 to 2009.

which a Notice of Preparation is published or environmental analysis begins on or after these applicable effective dates. Since the environmental analysis for the proposed project began prior to June 2, 2010, the thresholds for criteria pollutant technically would not apply. Since the risks and hazards thresholds are not effective until January 1, 2011, they would not apply to proposed changes to the project. Nevertheless, this impact analysis estimates project emissions using methodologies outlined in the 2010 BAAQMD CEQA Guidelines and compares estimated emissions to the 2010 BAAQMD significance thresholds.

Based on the analysis provided in the WTTIP EIR and recent adoption by the BAAQMD of the 2010 CEQA Guidelines, this analysis determined that the following potential air quality impacts identified for the project would not change based on current changes to the proposed project:

- *Impact 3.9-3: Air pollutant emissions from ventilation fans.* This impact would not apply to the Happy Valley Pipeline project because no ventilations fans are proposed to operate as part of pipeline construction.

- *Impact 3.9-4: Long-term increases in criteria pollutants during operation of upgraded treatment facilities.* This impact would not apply to the Happy Valley Pipeline because the proposed project would not involve operation of any treatment facilities.

- *Impact 3.9-5: Generation of odors during operation of project facilities.* This impact was determined to be less than significant in the WTTIP EIR for the Happy Valley Pipeline, and would remain the same with proposed project changes.

- *Impact 3.9-6: Secondary emissions at power plants due to the generation of electricity to operate pumps and other facilities, and short-term increases in criteria air pollutants during power outages requiring the use of emergency generators.* This impact was determined to be less than significant in the WTTIP EIR for the Happy Valley Pipeline since operation of the pipeline would not increase electricity demand. Therefore, this impact would remain the same with proposed project changes.

Criteria Pollutants and Precursors

The WTTIP EIR, based on the 1999 BAAQMD CEQA Guidelines, applied the following operational-phase thresholds: 80 pounds per day (lbs/day) of reactive organic gases (ROG), nitrogen oxide (NO_X), or PM_{10}, or 550 lbs/day of carbon monoxide (CO), which could cause a violation of the state ambient air quality standards for CO of 9 ppm averaged over 8 hours and 20 ppm over 1 hour (**Table 3.2.8-2**). With the BAAQMD's recent adoption of new quantitative thresholds of significance for construction-related and operational emissions, this SEIR includes a quantitative analysis of the project's construction-related emissions using worst-case assumptions for the project's construction emissions. As shown in Table 3.2.8-2, under the recently adopted BAAQMD thresholds of significance for criteria pollutants and precursors, the proposed project would result in a significant impact if construction-related or operational emissions were to exceed the following thresholds: more than 54 pounds per day of ROG or NO_X, 54 pounds per day of $PM_{2.5}$ (exhaust emissions only), or 82 pounds per day of PM_{10} (exhaust emissions only).

TABLE 3.2.8-2
THRESHOLDS OF SIGNIFICANCE FOR CRITERIA POLLUTANTS AND PRECURSORS

Pollutant/Precursor	BAAQMD Threshold Used In WTTIP EIR (lbs/day)[a]	2010 BAAQMD Threshold (lbs/day)[b]
Reactive Organic Gases (ROG)	80	54
Oxides of Nitrogen (NOx)	80	54
Suspended Particulates (PM_{10})	80	82
Suspended Particulates ($PM_{2.5}$)	n/a	54

SOURCE: [a] BAAQMD, 1999; [b] BAAQMD, 2010

The BAAQMD guidelines also provide the following additional significance thresholds for criteria pollutant emissions associated with project operation: more than 10 tons per year of ROG, NO_X, or $PM_{2.5}$ (exhaust emissions only), or 15 tons per year of PM_{10} (exhaust emissions only). However, since there would be no criteria pollutant emissions associated with operation of the Happy Valley Pipeline, these thresholds would not pertain to the proposed project and are not discussed further in this SEIR.

Toxic Air Contaminants and Community Risks and Hazards

The BAAQMD's formerly adopted (1999) and recently adopted (2010) thresholds for toxic air contaminants (TACs) are an increased cancer risk of more than 10 in 1 million for a person with maximum exposure potential and increased non-cancer risk of 1.0 Hazard Index (chronic or acute). The 2010 BAAQMD Guidelines apply the 1999 thresholds to construction emissions, and also add the following additional criterion to both construction-related and operational emissions: increase in annual average ambient $PM_{2.5}$ of more than 0.3 $\mu g/m^3$. The 2010 BAAQMD CEQA Guidelines outline a methodology for evaluating community risks and hazards impacts and new significance thresholds. Although these thresholds do not technically apply to the proposed project (they are effective January 1, 2011), the impact discussion has been updated under Impact 3.9-2 using this methodology and the 2010 significance thresholds.

The guidelines also require a cumulative evaluation when siting a new source or receptor, and the BAAQMD cumulative TAC thresholds for both construction-related and operational emissions (considering all sources within a 1,000-foot radius) are an increased cancer risk of more than 100 in 1 million for a person with maximum exposure potential, increased non-cancer risk of 1.0 Hazard Index (chronic or acute), and increase in annual average ambient $PM_{2.5}$ of more than 0.8 $\mu g/m^3$. However, since there would be no TAC emissions associated with operation of the proposed project and the proposed project would not involve siting a new source or receptor of TACs, such a cumulative evaluation would not be pertinent to the proposed project and therefore, cumulative operational emissions are not discussed further in this SEIR.

Impacts and Mitigation Measures

Impact 3.9-1: Short-term increases in fugitive dust (including inhalable particulates) and equipment exhaust emissions during construction activities.

Construction of the Happy Valley Pipeline would include construction within public roads and across Lauterwasser Creek and construction-related earthmoving activities would generate dust and exhaust emissions for approximately two to three months. The WTTIP EIR determined that project-related construction exhaust emissions would be considered significant because they would contribute to significant combined emissions associated with implementation of the WTTIP. The WTTIP EIR states that the BAAQMD considers potential construction-related impacts to be mitigated to a less-than-significant level with implementation of BAAQMD-recommended dust and equipment exhaust controls (Measures 3.9-1a, revised below and in Appendix A; 3.9-1b; and 3.9-1c).

In the WTTIP EIR, dust and equipment exhaust emissions were calculated based on the 1999 BAAQMD CEQA Guidelines. However, in June 2010, the BAAQMD adopted updated CEQA Guidelines, which specified a different methodology for estimating construction-related emissions and also established significance thresholds. This analysis estimates construction-related criteria pollutant emissions using this methodology and compares them to the recently adopted significance thresholds. **Table 3.2.8-3** presents the results of this analysis.

TABLE 3.2.8-3
CONSTRUCTION ACTIVITY EMISSIONS (pounds/day)

Activity[a]	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Construction in Roadways – Cut and Cover[b] (3 months)							
- Without Mitigation	4.9	36.7	21.3	0.0	12.3	4.2	3,775.9
- With Mitigation Measure 3.9-1-a – 3.9-1c	4.9	31.7	21.3	0.0	1.2	0.6	3,775.9
Construction in ROW – Creek Crossing (1 month)							
- Without Mitigation	3.5	20.4	14.7	0.0	1.7	1.6	2,057.8
- With Mitigation Measure 3.9-1a – 3.9-1c	3.5	17.4	14.7	0.0	0.3	0.2	2,057.8
Construction in ROW – Pipe Bursting (1 month)							
- Without Mitigation	2.6	13.9	9.7	0.0	1.1	1.0	1,367.9
- With Mitigation Measure 3.9-1a – 3.9-1c	2.6	11.8	9.7	0.0	0.2	0.2	1,367.9
BAAQMD Threshold	54	54	-	-	82	54	-

[a] Construction-related emissions were calculated using 2011 emissions factors to reflect worst-case conditions. Since emissions factors for 2012 and 2013 are lower, construction-related emissions would also be lower than the above estimates and, likewise would not exceed the 2010 BAAQMD significance thresholds.

[b] 2,013 cubic yards of material would be off-hauled, and haul trucks were assumed to carry 9 cubic yards per truck at 40 miles per round trip (136 miles per day on-road truck travel).

SOURCE: URBEMIS2007 Model, Output in Appendix C.

Construction of the proposed pipeline would result in dust and equipment exhaust emissions. As shown in Table 3.2.8-3, pipeline construction in the roadways, and construction in the ROW would not exceed the recently adopted BAAQMD significance thresholds for construction emissions. While construction in the roadways would overlap with construction in the District ROWs, the creek crossing and pipe bursting would not occur at the same time due to the limitations of space. Implementation of Measures 3.9-1a-HVPL, below, 3.9-1b, and 3.9-1c, as required in the WTTIP EIR and identified in Appendix A, would further reduce emissions criteria pollutants. These three measures are consistent with the "Basic Construction Mitigation Measures Recommended for All Proposed Projects" that are listed in the recently adopted BAAQMD CEQA Guidelines. Therefore, the project's construction-related emissions of fugitive dust and equipment exhaust would be less than significant.

Mitigation Measure

Measure 3.9-1a-HVPL: The District will incorporate into the contract specifications the following requirements:

BAAQMD Basic Control Measures

- 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.

- Load trucks in a manner that will 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 periodically up to daily with regenerative air or water sweepers with dust/particulate storage hoppers on all paved access roads, parking areas, and staging areas at construction sites and if visible soil material is carried onto adjacent streets.

Impact 3.9-2: Exposure of sensitive receptors to short-term increases in diesel particulates along truck haul routes during project construction.

Diesel trucks would be used to transport construction materials and diesel-powered construction equipment would be operated along the pipeline alignment, and combustion emissions from this equipment include suspended fine particulates ($PM_{2.5}$). When these emissions are generated by diesel-powered equipment, they are referred to as diesel particulate matter (DPM), which contain substances that are known as carcinogens. Diesel exhaust contains both pulmonary irritants and hazardous compounds that may affect sensitive receptors such as young children, senior citizens, or those susceptible to respiratory disease.

This impact was determined to be less than significant in the WTTIP EIR for the Happy Valley Pipeline. Although there would be no change in the construction-related truck volumes (see Table 2-4, Trip Generation Estimate –Happy Valley Analyzed in this SEIR), the BAAQMD adopted new significance thresholds related to diesel particulates since certification of the WTTIP EIR and they are described above (see Methodology, Toxic Air Contaminants and Community Risks and Hazards) as part of adoption of the 2010 BAAQMD CEQA Guidelines. While these thresholds do not technically apply to proposed changes to this project, this impact discussion uses methodologies and applies significance thresholds contained in the 2010 guidelines.

In order to assess the significance of construction-related TAC emissions (DPM), a screening level dispersion analysis was conducted for proposed changes to the project. The EPA's SCREEN3 dispersion model was run to calculate the diesel exhaust concentration for the peak exposure hour at the closest off-site residence, and model output is included in Appendix C. The peak exposure hour concentration was adjusted for the duration of construction and an individual cancer risk was calculated based upon generally accepted unit risk factors. A total of 185 pounds of DPM is estimated to be generated (unmitigated) over the construction lifetime and the maximum one-hour

DPM exposure anywhere around the construction zone would be approximately 0.035 microgram per cubic meter ($\mu g/m^3$) when spread out over 70 years. For screening purposes, this translates into a daily average of 0.014 $\mu g/m^3$ and an annual average of 0.0035 $\mu g/m^3$. The unmitigated excess cancer risk would be 300 in a million times the annual average, or 1.06 in a million. Such levels would be well below the BAAQMD's excess cancer risk of 10 in a million and ambient $PM_{2.5}$ annual average increase of 0.3 $\mu g/m^3$. Therefore, the project's construction-related local community risk and hazard impact would be less than significant.

3.2.9 Noise and Vibration

Environmental Setting

Section 3.10 of the WTTIP EIR presented the analysis of noise and vibration impacts for WTTIP projects. Section 3.10.1 (pp.3.10-1 – 3.10-3) defines the noise descriptors used below to describe and evaluate noise impacts.

Existing Noise Environment and Sensitive Receptors

The primary source of noise in areas adjacent to the project alignment is traffic traveling on Miner Road, Van Ripper Lane, and Lombardy Lane. These streets extend through areas developed with residential uses.

Regulatory Framework

The section of Miner Road between Lombardy Lane and Sycamore Road is located in the City of Orinda. The Noise Ordinance for the City prescribes hours for heavy equipment operation as well as noise limits for construction activities occurring outside specified construction time limits. Although ordinances do not strictly apply to EBMUD projects, it is the practice of EBMUD to work with host jurisdictions and neighboring communities during project planning and to conform to local environmental protection policies to the extent possible. Noise ordinance standards that are relevant to the construction of the proposed project are incorporated into the significance criteria below and summarized in **Table 3.2.9-1**.

Impacts and Mitigation Measures

Significance Criteria

Consistent with the WTTIP EIR, the proposed project would result in a significant impact if it would substantially increase the ambient noise levels for adjoining areas. This analysis uses the following criteria to define the significance of a predicted increase in noise levels:

- *Speech Interference.* Speech interference is an indicator of impact on typical daytime and evening activities. A speech interference criterion, in the context of impact duration and time of day, was used to identify "substantial" increases in noise from temporary construction activities. Noise peaks generated by construction equipment could result in speech

TABLE 3.2.9-1
APPLICABLE ORDINANCE TIME LIMITS AND NOISE STANDARDS

				Ordinance Noise Limits for Various Activities in Single-Family Residential Zones (dBA)	
	Construction Time Limits			Day (Leq)	Night (Leq)
Jurisdiction	Weekdays	Saturdays	Sundays and Holidays	7:00 a.m. to 10:00 p.m.	10:00 p.m. to 7:00 a.m.
Orinda[a]	8:00 a.m. to 6:00 p.m.	10:00 a.m. to 5:00 p.m.	Not Allowed	60 (Ldn)	55

– not specified

a *Time Limits*: Orinda Municipal Code, Chapter 17.39.3 specifies construction time limits. Operation of heavy construction equipment is not allowed on Saturdays or Sundays.

Noise Limits: To account for duration and timing, the Orinda Municipal Code, Chapter 17.15.2, stipulates a noise limit of 60 dBA (Ldn) in residential districts. The ordinance further reduces noise levels by 5 dB between 10 p.m. and 7 a.m. relative to the 60 Ldn. The ordinance suggests that the energy-averaged sound level between 10 p.m. and 7 a.m. should be 55 dBA. Noise that is produced for cumulative periods of no more than 5 minutes and 1 minute in any hour may exceed the standards by 5 dB and 10 dB, respectively. Presumably, these noise levels would be limited to 65 and 70 dBA, respectively. Construction activities are exempt from the daytime limits if they occur during specified construction time limits (EBMUD, 2006).

interference in adjacent buildings if the noise level in the interior of the building exceeds 45 to 60 dBA.[12] A typical building can reduce noise levels by 25 dBA with the windows closed (U.S. EPA, 1974). This noise reduction could be maintained only on a temporary basis in some cases, since it assumes windows must remain closed at all times. Since a typical building can reduce noise levels by 25 dBA (with closed windows), an exterior noise level of 70 dBA at receptors, would maintain an acceptable interior noise environment of 45 dBA. It should be noted that such noise levels would be sporadic rather than continuous in nature, because different types of construction equipment would be used throughout the construction process.

- *Local Noise Ordinances*. The proposed project is located in Orinda, and project-related noise increases and proposed construction hours were compared to the noise level and construction time limits contained in this city's noise ordinance for consistency (listed in Table 3.2.9-1).

Methodology

Based on the analysis provided in the WTTIP EIR in conjunction with proposed changes in construction methods associated with the proposed project, this analysis determined that the following potential noise impacts identified for the project would not change based on current changes to the proposed project:

- *Impact 3.10-2: Increased noise levels along truck haul routes*. This impact was determined to be less than significant in the WTTIP EIR for the Happy Valley Pipeline, and would

12 For indoor noise environments, the highest noise level that permits relaxed conversation with 100 percent intelligibility throughout the room is 45 dBA. Speech interference is considered to become intolerable when normal conversation is precluded at 3 feet, which occurs when background noise levels exceed 60 dBA. For outdoor environments, the highest noise level that permits normal conversation at 3 feet with 95 percent sentence intelligibility is 66 dBA (U.S. EPA, 1974).

remain the same with proposed project changes since there would be no change in construction-related truck volumes. However, instead of trucks operating only on Lombardy Lane, they would operate mostly on Miner Road with fewer trips on Lombardy Lane and Van Ripper Lane.

- *Impact 3.10-4: Noise increases during facility operations.* This impact was determined to be less than significant in the WTTIP EIR for the Happy Valley Pipeline, and would remain the same with proposed project changes. Operation of the proposed pipelines would not generate noise since it would be located underground.

Changes in construction methods for the proposed project could, however, alter noise impacts identified in the WTTIP EIR for proposed project under Impacts 3.10-1, construction-related noise increases, and 3.10-3, construction-related vibration impacts. These impacts are discussed below.

Impacts and Mitigation Measures

Impact 3.10-1: Intermittent and temporary noise above existing ambient levels during construction.

Pipeline Construction in Public Roadways

Sensitive receptors along the Miner Road and Van Ripper Lane pipeline segments are limited to residential uses; the closest distance evaluated in the WTTIP EIR was 50 feet from the pipeline alignment. Most single-family residences are located approximately 40 feet or more from the proposed pipeline alignment in Miner Road, although there are a couple residences on Miner Road located as close as 25 feet from the alignment. Residences on Van Ripper Lane are located 30 feet or more from the proposed alignment. As indicated in **Table 3.2.9-2** (first two rows), construction noise within 50 feet would exceed the 70-dBA speech interference criterion both without and with implementation of noise controls (see Measure 3.10-1a-HVPL). Even with noise controls, construction noise levels would still exceed the speech interference criterion by 4 to 17 dB for most types of construction equipment. However, pipeline construction progresses along an alignment (rather than persisting at one location) so that any given residence is typically subject to construction noise for about two weeks (and not for the entire duration of project construction), followed later by a couple of additional days for paving the trench.

Consistent with the WTTIP EIR, construction-phase noise impacts are considered to be significant but mitigated to a less-than-significant level if noise controls are implemented (Measure 3.10-1a-HVPL), ordinance time limits are adhered to, and construction duration at any one receptor is limited to approximately two weeks. However, pipeline construction in Miner Road and Van Ripper Lane is proposed to occur from 9:00 a.m. to 9:00 p.m., Monday through Friday, which extends beyond the time limits specified by the Orinda Noise Ordinance (8:00 a.m. to 6:00 p.m.). EBMUD has extended the construction hours on weekdays in order to shorten the duration of road closure for Miner Road and associated disruption of traffic flow. Therefore, this conflict with ordinance time limits could not be reduced to a less-than-significant level and this noise impact would be significant and unavoidable, even with implementation of noise controls.

TABLE 3.2.9-2
ESTIMATED DAYTIME CONSTRUCTION NOISE LEVELS AT THE CLOSEST SENSITIVE RECEPTORS AND CONSISTENCY WITH SIGNIFICANCE THRESHOLD

Project and Receptor Location	Maximum Noise Source	Reference Hourly Leq in dBA @ 50 feet[a]	Distance between Closest Project and Receptor[b]	Distance Adjustment[c]	Adjusted Leq	Exterior Speech Interference Threshold	Reduction due to Controls[d]	Mitigated Leq with Controls
Segment in Public Roadways – many residential receptors are a minimum of 50 feet away	Earthmoving Equipment	85	50	0	**85**	70	-10	**75**
	Trucks	91	50	0	**91**	70	-16	**75**
	Materials Handling, Compactor, Paver	85	50	0	**85**	70	-10	**75**
	Drilling/Stationary Equipment	80	50	0	**80**	70	-6	**74**
	Impact Equipment	87	50	0	**87**	70	-13	**74**
Segment in Public Roadways – Closest residential receptors are minimum of 25 feet away	Earthmoving Equipment	85	25	6	**91**	70	-10	**81**
	Trucks	91	25	6	**97**	70	-16	**81**
	Materials Handling, Compactor, Paver	85	25	6	**91**	70	-10	**81**
	Drilling/Stationary Equipment	80	25	6	**86**	70	-6	**80**
	Impact Equipment	87	25	6	**93**	70	-6	**87**
Segment in ROWs – closest residential receptors are minimum of 50 feet away	Backhoe, Excavator, Loader	85	50	0	**85**	70	-10	**75**
	Trucks	91	50	0	**91**	70	-16	**75**
	Materials Handling, Compactor	85	50	0	**85**	70	-10	**75**
	Pneumatic Equipment	86	50	0	**86**	70	-6	**80**
	Jackhammers	88	50	0	**88**	70	-13	**75**

NOTES: Noise levels in **BOLD** indicate the 70-dBA speech interference threshold would be exceeded.

[a] Reference noise levels represent the highest noise level by equipment type (without controls) listed at 50 feet in Table 3.10-4 of the WTTIP EIR.
[b] The distances represent the minimum distance between the receptor and the closest facility location.
[c] Distance adjustment accounts for the rate of noise attenuation that occurs with distance from a noise source. The rate of attenuation (i.e., reduction) is about 6 dBA for every doubling of distance from a point source.
[d] Noise control reductions represent the difference between the highest noise levels listed in Table 3.10-4 of the WTTIP EIR with controls versus without controls.

SOURCE: Table compiled by Orion Environmental Associates.

Construction staging (temporary storage of construction material and equipment) would occur along Van Ripper Lane and in turnouts on Miner Road during pipeline construction. Noise associated with equipment operation (as materials are delivered, stored, and then moved to the construction site) would occur periodically throughout the day for the duration of its use, which could exceed two weeks at some locations. Therefore, short-term noise increases at staging areas would be potentially significant and implementation of noise controls (Measure 3.10-1a-HVPL) would be required, but would not necessarily reduce equipment noise to less-than-significant levels if the staging area is used for longer than two weeks and is in close proximity to homes.

Pipeline Construction in ROWs

Sensitive receptors along the District ROWs are limited to two residences on Van Ripper Lane and two residences on Miner Road. The proposed pipeline segment that crosses Lauterwasser Creek

(approximately 100 feet long) that would be replaced using hand operated equipment is located a minimum of 50 feet from closest residence on Van Ripper Lane (85), and jackhammers, the noisiest of proposed light equipment, are proposed to be used. Table 3.2.9-2 shows that operation of jackhammers at the closest location would generate noise levels that would exceed the 70-dBA speech interference criterion, a significant noise impact. Consistent with the WTTIP EIR, construction noise impacts are considered to be significant but mitigated to a less-than-significant level if noise controls are implemented (Measures 3.10-1a-HVPL and 3.10-1b-HVPL), ordinance time limits are adhered to, and construction duration at any one receptor is limited to approximately two weeks. Since operation of jackhammers would be less than two weeks and construction hours for this pipeline segment (8:00 a.m. to 5:00 p.m., Monday through Friday) would be consistent with ordinance time limits, potential noise impacts associated with operation of light equipment for this pipeline segment is considered to be mitigated to a less-than-significant level with implementation of noise controls (Measures 3.10-1a-HVPL and 3.10-1b-HVPL).

A dewatering pump may be required to operate continuously (24 hours per day, seven days per week) for up to one month, during construction of the pipeline segment across Lauterwasser Creek. Dewatering pumps are typically similar in size to the pumps used for swimming pools and these types of pumps typically generate noise levels of approximately 45 dBA (Leq) at 50 feet. This pump would be located within the creek vicinity; the closest homes are located 100 to 200 feet away. It is likely that at least one home to the north of the creek could have direct line of sight to the pump. At such distances however, pump noise would remain well below the 55-dBA nighttime ordinance noise limit (Table 3.10-1a) at these residences. Therefore, 24-hour operation of dewatering pumps would have a less-than-significant impact.

The proposed pipeline segment that extends from just south of Lauterwasser Creek to Miner Road (approximately 350 feet long) could be constructed using the pipe bursting method. The primary sources of noise associated with this method would be the backhoe/excavator used to construct the receiving pit (in Miner Road, approximately 50 feet from the closest residence). As indicated in Table 3.2.9-2 (third row), construction noise within 50 feet would exceed the 70-dBA speech interference criterion both without and with implementation of noise controls (see Measures 3.10-1a-HVPL and 3.10-1b-HVPL). Even with noise controls, construction noise levels would still exceed the speech interference criterion by 5 to 10 dB for most types of construction equipment, and would result in a significant noise impact. Consistent with the WTTIP EIR, construction noise impacts are considered to be significant but mitigated to a less-than-significant level if noise controls are implemented (see Measures 3.10-1a-HVPL and 3.10-1b-HVPL), ordinance time limits are adhered to, and construction duration at any one receptor is limited to approximately two weeks. While construction hours for this pipeline segment (8:00 a.m. to 6:00 p.m., Monday through Friday) would be consistent with ordinance time limits, the residence located directly adjacent to the pipeline alignment would be subject to construction noise levels that exceed the 70-dBA speech interference criterion for approximately one month. Noise controls would be required (see Measures 3.10-1a-HVPL and 3.10-1b-HVPL). However, this noise impact could still not be reduced to a less-than-significant level and this noise impact would be significant and unavoidable, even with implementation of noise controls.

Proposed closure of Miner Road and Van Ripper Lane would divert traffic onto two possible detour routes (St. Stephens Drive-Via Las Cruces-Honey Hill Road or Camino Sobrante-La Espiral Road-Via Las Cruces-Honey Hill Road) between 9:00 a.m. and 9:00 p.m. Closure of Miner Road would increase traffic on both of these routes during the two to three month construction period. Since these local streets carry low levels of traffic, noise increases associated project-related traffic increases of up to 80 vehicles per hour could be noticeable. However, even with these increases, daytime noise levels along these routes would remain below the 70-dBA speech interference threshold and therefore, would be less than significant.

Motorists wishing to use Van Ripper Lane through the closed section would be directed to use the westerly intersection of Lombardy Lane and Van Ripper Lane. Given the low volume of traffic that would be diverted, this diversion would not significantly increase traffic noise levels on the westerly section of Van Ripper Lane.

Mitigation Measures

To reduce some identified significant construction-related noise impacts to a less-than-significant level, WTTIP EIR Measures 3.10-1a and 3.10-1b, as revised below, would still be required for the proposed project.

> **Measure 3.10-1a-HVPL:** The District will incorporate into contract specifications a requirement that construction activities at the construction site will not cause daytime noise levels to exceed the 70-dBA speech interference criterion at the closest affected sensitive receptors for more than two weeks (except at the Lauterwasser Creek pipeline crossing, which will occur for approximately one month at one receptor), as well as that noise levels are consistent with local ordinances (see Table 3.2.9-1). Measures that would be implemented to reduce noise levels (as demonstrated in Table 3.2.9-2) to meet this criterion include the following:
>
> - Truck operations (haul trucks and concrete delivery trucks) will be limited to the daytime hours, as described in Measure 3.10-1b-HVPL.
>
> - Best available noise control techniques (including mufflers, intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds) will be used for all equipment and trucks as necessary.
>
> - If impact equipment (e.g., jack hammers, pavement breakers, and rock drills) is used during project construction, an exhaust muffler on the compressed-air exhaust will be used (a muffler can lower noise levels from the exhaust by up to about 10 dB). External jackets on the tools themselves will be used, where feasible, which could achieve a reduction of 5 dB. Quieter procedures, such as drilling rather than impact equipment, will be used whenever feasible.
>
> - Stationary noise sources will be located as far from sensitive receptors as possible. If they must be located near receptors, adequate muffling (with enclosures) will be used to ensure local noise ordinance limits are met. Enclosure opening or venting will face away from sensitive receptors. Enclosures will be designed by a registered engineer regularly involved in noise control analysis and design. Operation of any stationary equipment beyond the time limits specified will meet applicable noise ordinance noise limits (see Measure 3.10-1b-HVPL).

- Material stockpiles as well as maintenance/equipment staging and parking areas will be located as far as practicable from residential and school receptors.

An EBMUD contact person will be designated for responding to construction-related issues, including noise. The name and phone number of the liaison will be conspicuously posted at construction areas (and on both sides of the ROW alignment), on all advanced notifications, and on the EBMUD project website. This person will take steps to resolve complaints, including periodic noise monitoring, if necessary.

Measure 3.10-1b-HVPL: Construction will be restricted to the hours of operation specified in the Orinda Noise Ordinance (as listed in Table 3.10-1, including restrictions provided in footnotes and any other ordinance exceptions and provisions in effect at the time of this SEIR publication), except for pipeline construction in roadways (which is proposed to occur during 9:00 a.m. to 9:00 p.m., Monday through Friday), during critical water service outages or other emergencies and special situations (including pipeline construction in Miner Road and Van Ripper Lane, which is proposed to occur from 9:00 a.m. to 9:00 p.m., Monday through Friday). Any equipment operating beyond these hours will be subject to the day and night noise limits for various activities in single-family residential zones.

Impact 3.10-3: Construction of WTTIP facilities could cause vibration that could disturb local residents and cause cosmetic damage to buildings and structures.

The WTTIP EIR assumed that the open-trench construction method would be employed for the entire pipeline alignment. The proposed changes to the project would involve relocation of the pipeline segment from Lombardy Lane to Miner Road and Van Ripper Lane, as well as the addition of a pipeline segment within the District ROWs across Lauterwasser Creek.

Construction-related vibration effects along Miner Road and Van Ripper Lane would be similar to those described in the WTTIP EIR for the Happy Valley Pipeline. In the WTTIP EIR, construction-related vibration impacts were determined to be less than significant for the Happy Valley Pipeline because sheetpile driving and impact pile driving would not be required. The WTTIP EIR established a performance standard of 0.5 in/sec PPV as the vibration limit to prevent cosmetic damage to structures.

The same types of construction equipment associated with open-trench pipeline construction (e.g., pavement saws, jack hammers, excavators, backhoes, dump trucks, front-end loaders, forklifts, flatbed delivery trucks, paving equipment, asphalt and/or concrete trucks, rollers, water trucks, and vibratory compactors) would also be used for pipeline construction in Miner Road and Van Ripper Lane. Vibration generated by these types of equipment would not exceed the 0.5 in/sec threshold at distances of approximately 15 feet or more (FTA, 2006). Since setback distances of existing homes along Miner Road and Van Ripper Lane from the proposed pipeline alignment in public roadways would be more than 15 feet, vibration effects from open-trench pipeline construction would be less than significant.

However, in addition to proposed relocation of the pipeline alignment, a combination of pipe bursting and hand digging methods could be used for the pipeline segment located within the

ROWs. Equipment proposed to be used for the pipeline segment in and near Lauterwasser Creek include a mini-excavator/loader (e.g. Bobcat), jackhammers, plate compactors, and other light equipment. Vibration associated with these types of equipment would remain well below the 0.5 in/sec threshold and therefore, would be less than significant.

The pipeline segment from just south of the creek to Miner Road could be replaced using the pipe bursting method and equipment typically associated with this method include generators, winches, excavators, backhoes, dump trucks, front-end loaders, flatbed delivery trucks, pavement saws, jack hammers, and vibratory compactors. As indicated in Figure 2-4 in Chapter 2, Description of the Proposed Project, the pipe bursting process would generate ground displacement and vibration that would have the potential to damage adjacent pipelines, utilities and structures. Ground vibration diminishes significantly within a short distance; as a result, only utilities or structures that are located directly adjacent to the pipeline replacement have the potential to be affected.

Studies on the pipe bursting construction method indicate that ground vibrations could be noticeable to a person standing on the surface close to a pipe bursting operation, but the levels of vibration are unlikely to exceed 2 inches per second (specified as the threshold for damage to sensitive surface structures[13]) beyond 7 or 8 feet from the bursting head (Simicevic et al., 2001; Atalah, 2004). For buried utilities, damage would not be likely if pipe bursting occurs more than 2.5 to 3 feet from the bursting head (Simicevic et al., 2001; Atalah, 2004). Within these distances, studies recommend excavation in the bursting path to protect adjacent structures.

An existing home on Miner Road is immediately adjacent to the District ROW and may be as close as 3 to 5 feet from pipe bursting activities. Potential vibration effects are considered to be a potentially significant impact due to the proximity of this existing home to the pipeline alignment.

In addition to vibration generated by the pipe bursting operation itself, vibration would be generated by operation of other identified heavy equipment. Most heavy equipment operation would occur in the vicinity of the insertion and receiving pits, which are located at least 50 feet from existing structures. Vibration effects would be less than significant at 50 feet or more. However, vibratory compactors could be operated less than 10 feet from the adjacent residence north of Miner Road, and at such proximity, vibration levels would have the potential to exceed the 0.5 in/sec threshold level, depending on the size of the vibratory compactor, a potentially significant impact.

To reduce potentially significant vibration effects from pipe bursting activities and operation of vibratory compactors in the District ROW to a less-than-significant level, implementation of Measures 3.10-3a-HVPL and 3.10-3b-HVPL would limit vibration levels to the 0.5 in/sec threshold at all adjacent structures and require exposure of the pipe to reduce contact with the surrounding ground where pipe bursting is used within 10 feet of a residence, respectively. Measure 3.10-3c-HVPL would ensure that in the unlikely situation that any damage occurs as the result of the proposed project the District would repair the damage. Implementation of these

[13] This threshold is also consistent with the U.S. Bureau of Mines' criterion of 2.0 inches per second Peak Particle Velocity for structural damage to buildings, as indicated under Impact 3.10-2 of the 2006 WTTIP EIR.

measures would reduce vibration effects near the existing residence located immediately west of the District ROW and north of Miner Road.

Mitigation Measure

To reduce identified significant construction-related vibration impacts to a less-than-significant level, Measures 3.10-3a-HVPL, 3.10-3b-HVPL, and 3.10-3c-HVPL, as modified, will be required for the proposed project.

> **Measure 3.10-3a-HVPL:** To prevent cosmetic or structural damage to structures adjacent to the District's ROW, EBMUD will incorporate into contract specifications restrictions on equipment operation, whereby surface vibration will be limited to no more than 0.5 in/sec PPV, measured at the nearest residential structures. EBMUD will also monitor for excessive vibration when pipe bursting activities occur immediately adjacent to the 557 Miner Road residence. If vibration levels are found to exceed the 0.5 in/sec PPV threshold, construction will be halted immediately and alternative construction methods will be implemented to maintain vibration levels below this threshold.
>
> **Measure 3.10-3b-HVPL:** When pipe bursting is used within the District ROW and a structure is within 10 feet of the pipe bursting operation EBMUD construction specifications will require the contractor to excavate around the pipe to reduce contact with the surrounding ground and avoid impacts related to soil movement and vibration.
>
> **Measure 3.10-3c-HVPL:** With permission of homeowners, EBMUD will conduct a preconstruction survey of homes, other sensitive structures, hardscaping, hillsides, and slide areas adjacent to the District's ROW, for potential effects due to vibration-generating activities. EBMUD will respond to any claims by inspecting the affected property promptly, but in no case more than five working days after the claim was filed. Any new cracks or other changes in structures will be compared to preconstruction conditions and a determination made as to whether the proposed project could have caused such damage. In the event that the project is demonstrated to have caused the damage, the District will have the damage repaired to the pre-existing condition.

3.2.10 Greenhouse Gas Emissions

Environmental Setting

Greenhouse Gases

Gases that trap heat in the atmosphere are referred to as greenhouse gases (GHGs) because they are transparent to solar heat radiation, but capture heat radiated by the earth back into the atmosphere, much like a greenhouse. The principal GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone (O_3), and water vapor (H_2O).[14]

[14] Ozone that is not directly emitted but formed from other gases in the troposphere—the lowest level of the earth's atmosphere—also contributes to the retention of heat.

The accumulation of GHGs has been implicated as a driving force for global climate change. Climate change is commonly used interchangeably with "global warming" and the "greenhouse effect." Definitions of climate change vary between and across regulatory authorities and the scientific community, but in general can be described as the changing of the earth's climate caused by natural fluctuations and anthropogenic activities that alter the composition of the global atmosphere.

While the primary GHGs in the atmosphere are naturally occurring, the presence of CO_2, CH_4, and N_2O is largely the result of human activities that have accelerated the rate at which these compounds occur within the earth's atmosphere. CO_2 is the "reference gas" for climate change, meaning that emissions of GHGs are typically reported in "carbon-dioxide-equivalent" measures. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas CH_4 results from off-gassing associated with agricultural practices and landfills. Other GHGs with much greater heat-absorption potential than CO_2, including hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, are generated in certain industrial processes. There is international scientific consensus that human-caused increases in GHGs have and will continue to contribute to global warming, although there is uncertainty concerning the magnitude and rate of the warming. The effects of climate change on the natural environment in California may include, but are not limited to, sea level rise, extreme heat conditions that could last longer and become more frequent, reduced snowpack, more high ozone days, more large forest fires, and more drought years. Secondary effects are likely to include a global rise in sea level, impacts on agriculture, changes in disease vectors, and changes in habitats and biodiversity.

The California Energy Commission (CEC) estimated that in 2004 California produced 500 million gross metric tons of carbon-dioxide-equivalent GHG emissions ($MMTCO_2e$), or about 550 million U.S. tons.[15] The CEC found that transportation is the source of 38 percent of the state's GHG emissions, followed by electricity generation (both in-state and out-of-state) at 23 percent and industrial sources at 13 percent (CEC, 2007).

Regulatory Framework

Since adoption of the WTTIP EIR, there have been considerable new regulations and air quality planning efforts related to climate change and GHGs.

Federal Policies

With respect to GHGs, the U.S. Supreme Court ruled on April 2, 2007 that CO_2 is an air pollutant as defined under the Clean Air Act, and that the U.S. EPA has the authority to regulate GHG emissions. No federal regulations or policies regarding GHG emissions have been adopted that would be applicable to the proposed project. In late 2009, EPA finalized an "endangerment

[15] Every greenhouse gas has a global warming potential (GWP), a measurement of the impact that the particular gas has on "radiative forcing" (i.e., the additional heat/energy that is retained in the earth's ecosystem through the addition of this gas to the atmosphere). Carbon dioxide equivalents provide a universal standard of measurement against which the effects of releasing (or avoiding the release of) different greenhouse gases can be evaluated. Methane has a GWP of 21 and nitrous oxide has a GWP of 310, meaning that their effect on global warming would be 21 and 310 times greater, respectively, than an equivalent amount of carbon dioxide.

finding" and a "cause and contribute finding" that state that anthropogenic GHGs contribute to global warming and that such warming endangers the public health of existing and future generations. These findings are expected to support adoption of federal GHG emission rules for light duty vehicles. Adoption of such rules would not directly affect the proposed project, and are not expected to become effective until project construction activities have been completed.

State Policies and Regulations

Executive Order S-3-05 (2005). In 2005, in recognition of California's vulnerability to the effects of climate change, Governor Schwarzenegger announced the following GHG emission reduction targets, as established through Executive Order S-3-05: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels.

Assembly Bill 32 (2006). In 2006, California passed the California Global Warming Solutions Act of 2006 (Assembly Bill No. 32 or AB 32; California Health and Safety Code Division 25.5, Section 38500, et seq.). It requires the California Air Resources Board (CARB) to design and implement emission limits, regulations, and other measures to reduce statewide GHG emissions to 1990 levels by 2020 (representing a 25 percent reduction in emissions). The reduction would be accomplished through an enforceable statewide cap on global warming emissions and reduction measures that would be phased in starting by 2012, and through discrete early action measures that could be adopted as regulations and made effective by 2010. Some proposed early action measures will require new legislation to implement, some will require subsidies, some have already been developed, and some will require additional effort to evaluate and quantify. AB 32 primarily establishes a time frame for the CARB to adopt emissions limits, rules, and regulations, but the act does not provide thresholds or methodologies for analyzing a project's impacts on global climate change.

CARB Scoping Plan (2008). Pursuant to AB 32, the CARB adopted the Scoping Plan in December 2008, which is the State's plan to achieve GHG reductions in California required by AB 32. The Scoping Plan contains the main strategies California will implement to achieve reduction of 169 MMT of CO_2e, or approximately 30 percent from the state's projected 2020 emission level of 596 MMT of CO_2e under a business-as-usual scenario, and a reduction of 42 MMT CO_2e, or almost 10 percent, from 2002–2004 average emissions.

The Scoping Plan also includes CARB-recommended GHG reductions for each emissions sector of the state's GHG inventory. The largest proposed GHG reductions are expected to be achieved from improving emission standards for light-duty vehicles (estimated reductions of 31.7 MMT CO_2e), implementation of the Low Carbon Fuel Standard (15.0 MMT CO_2e), energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (26.3 MMT CO_2e), and a renewable portfolio standard for electricity production (21.3 MMT CO_2e). CARB has not yet determined what amount of GHG reductions from local government operations will be recommended; however, the Scoping Plan does state that land use planning and urban growth decisions will play an important role in the state's GHG reductions because local governments have primary authority to plan, zone, approve, and permit how land is

developed to accommodate population growth and the changing needs of their jurisdictions. The CARB is also developing an additional protocol for community emissions. CARB further acknowledges that decisions on how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors. The Scoping Plan states that the ultimate GHG reduction assignment to local government operations is to be determined (CARB, 2008). With regard to land use planning, the Scoping Plan expects approximately 5.0 MMT CO_2e will be achieved associated with implementation of SB 375, which is discussed further below.

Other Bills and Executive Orders. There are other senate bills and executive orders that have been passed over the past several years, and they relate to: reducing GHG emissions from electricity generation (Senate Bills 1078, 107, and 1368, Executive Order S-14-08**)**; establishing guidelines for mitigating GHG emissions or the effects of GHG emissions under CEQA by 2010 (Senate Bill 97**)**; aligning regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation through adoption of a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS) (Senate Bill 375); establishing targets for reducing GHG emissions to the 2000 level by 2010 and to the 1990 level by 2020, and to 80 percent below the 1990 level by 2050 (Executive Order S-3-05); providing land use planning guidance related to sea level rise and other climate change impacts (Executive Order S-13-08); and establishing a Low-Carbon Fuel Standard (LCFS) and coordinating actions of the CEC, the CARB, the University of California, and other agencies to develop and propose protocols for measuring the life-cycle carbon intensity" of transportation fuels (Executive Order S-01-07).

Local Regulations Policies and Regulations

Bay Area Air Quality Management District Climate Protection Program. The BAAQMD established a climate protection program to reduce pollutants that contribute to global climate change and affect air quality in the Bay Area Air Basin. The climate protection program includes measures that promote energy efficiency, reduce vehicle miles traveled, and develop alternative sources of energy—all of which assist in reducing emissions of GHG and in reducing air pollutants that affect the health of residents. BAAQMD also seeks to support current climate protection programs in the region and to stimulate additional efforts through public education and outreach, technical assistance to local governments and other interested parties, and promotion of collaborative efforts among stakeholders.

Impacts and Mitigation Measures

Significance Criteria

Pursuant to SB 97, the CEQA Guidelines were amended to address GHG emissions and these changes became effective March 18, 2010. Since these criteria were adopted after certification of the WTTIP EIR, these thresholds were not previously considered. According to the updated CEQA Guidelines, a project would have a significant effect on GHG emissions if it would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, based on any applicable threshold of significance; or

- Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHG (including AB 32, the California Global Warming Solutions Act of 2006, and the AB 32 Scoping Plan).

The amendments require determination of the significance of a project's direct and indirect GHG emissions based on any applicable threshold of significance, and whether a project's emissions would conflict with any applicable GHG reduction plans, policies, or regulations.

Methodology

The recently adopted BAAQMD thresholds of significance include a GHG threshold for operational emissions but none for construction (BAAQMD, 2010), although the BAAQMD recommends a case-by-case consideration of construction GHG emissions and encourages lead agencies to incorporate best management practices to reduce GHG emissions during construction, as feasible and applicable (BAAQMD, 2010). Best management practices could include, but are not limited to: using alternative fueled (e.g., biodiesel, electric) construction vehicles/equipment of at least 15 percent of the fleet; using local building materials of at least 10 percent; and recycling or reusing at least 50 percent of construction waste or demolition materials.

The impact analysis below calculates the quantity of GHGs that would be emitted during project construction, and then compares it to total GHG emissions in the Bay Area as well as BAAQMD operational significance thresholds (since there are no construction-related thresholds). While there would be no operational thresholds associated with the proposed project, the BAAQMD's significance threshold for GHGs related to projects other than stationary sources (1,100 MT of CO_2e per year) is the threshold most relevant to the proposed project.

Impacts and Mitigation Measures

Impact 3.9-7-HVPL: GHG construction emissions and conflicts with any applicable plans, policies, or regulations adopted for the purpose of reducing GHG emissions.

Project construction activities are estimated to occur over two to three months, and the resulting exhaust emissions from off-road equipment, on-road trucking, and construction worker commute traffic during this period are expected to contribute minimally to long-term regional increases in GHGs. No state or regional air quality agency has adopted a methodology or quantitative threshold that can be applied to a construction project to evaluate the significance of an individual project's construction-related contribution to GHG emissions, such as those that exist for criteria pollutants. The BAAQMD CEQA Guidelines also do not specify thresholds of significance for construction-related GHG emissions, but recommend quantification and disclosure of a project's construction-related GHG emissions. BAAQMD Guidelines also encourage incorporation of best management practices to reduce GHG emissions during construction, as applicable.

As indicated in **Table 3.2.10-1**, construction of the Happy Valley Pipeline would generate up to approximately 123 pounds per day of CO_2 or 3.44 metric tons (MT) per year of CO_2-equivalent

TABLE 3.2.10-1
CONSTRUCTION ACTIVITY GHG EMISSIONS (tons/year)

Activity	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
2011 Cut and Cover[a] (3 months)							
- Without Mitigation	0.16	1.19	0.69	0.00	0.40	0.14	122.72
- With Mitigation	0.16	1.03	0.69	0.00	0.04	0.02	122.72
2011 Creek Crossing (1 month)							
- Without Mitigation	0.04	0.22	0.16	0.00	0.02	0.02	22.64
- With Mitigation	0.04	0.19	0.16	0.00	0.00	0.00	22.64
2011 Pipe Bursting (1 month)							
- Without Mitigation	0.03	0.15	0.11	0.00	0.01	0.01	15.05
- With Mitigation	0.03	0.13	0.11	0.00	0.00	0.00	15.05

[a] 2,013 cubic yards of material would be off-hauled, and haul trucks were assumed to carry 9 cubic yards per truck at 40 miles per round trip.

SOURCE: URBEMIS2007 Model, Output in Appendix C.

(CO_2e).[16] Emissions associated with project construction would represent approximately 0.0000034 percent of total GHG emissions estimated for the entire Bay Area.[17] The contribution of GHG emissions from the proposed project would be extremely small in terms of the Bay Area GHG emissions. When compared to the BAAQMD's operational threshold of 1,100 MT of CO_2e per year for projects other than stationary sources, construction-related GHG emissions would be less than significant. Implementation of WTTIP EIR Measure 3.9-1c (described in Appendix A), BAAQMD Exhaust Control Measures, which include idling restrictions specified in CCR Title 13, Section 2485, would also limit criteria pollutant emissions, and this, in turn, would also reduce construction-related GHG emissions.

Mitigation Measure

Although the project's construction GHG emissions would be less than significant, the BAAQMD recommends that BMPs be implemented where feasible to reduce GHG emissions, and these are listed as follows.

> **Measure 3.9-7-HVPL:** The District will incorporate into the contract specifications the following BAAQMD-recommended Best Management Practices (BMPs) for GHG emissions for implementation, where feasible:
>
> - At least 15 percent of the fleet should be alternative-fueled (e.g., biodiesel, electric) construction vehicles/equipment.

16 When CO_2 and non-CO_2 GHG emissions are considered together, they are referenced as CO_2-equivalents (CO_2e), which add approximately three percent to CO_2 emissions from diesel equipment exhaust (California Climate Action Registry, 2007).

17 The Bay Area Air Quality Management District (2008) reported regional Bay Area GHGs emissions in 2007 at approximately 102.6 MMT CO_2e (95.5 MMT CO_2e were emitted within the Bay Area Air District and 7.1 MMT CO_2e were indirect emissions from imported electricity).

- At least 10 percent of building materials should be from local sources.
- At least 50 percent of construction waste or demolition materials should be recycled or reused.

3.3 Other Environmental Issues

The proposed changes to the project described in Chapter 2 would not materially affect the WTTIP analyses and conclusions regarding impacts for a number of environmental topics. These topics are briefly discussed below.

3.3.1 Hazards and Hazardous Materials

The analysis of Hazards and Hazardous Materials in the WTTIP EIR (see pp. 3.11-1 to 3.11-41) determined that all impacts related to this resource would be less than significant or could be mitigated to less-than-significant levels. With mitigation, impacts related to hazardous materials in soil or groundwater or high-pressure gas line rupture could be mitigated to less-than-significant levels. Impacts related to risk of wildland fires during construction and release of hazardous materials from construction equipment would be less than significant. The changes to the Happy Valley Pipeline project proposed in this SEIR would not alter the impact analysis conclusions for this resource area. Applicable mitigation measures to reduce potential hazards and hazardous materials impacts identified in the WTTIP EIR are incorporated into the Mitigation and Monitoring and Reporting Plan (MMRP) for the Project (Appendix A).

3.3.2 Public Services and Utilities

The analysis of Public Services and Utilities in the WTTIP EIR (see pp. 3.12-1 to 3.12-22) determined that all impacts related to this resource would be less than significant or could be mitigated to less-than-significant levels. With mitigation, impacts related to disruption of utility lines, adverse effect on landfill capacity, and failure to achieve state diversion mandates could be mitigated to less-than-significant levels. Impacts related to increase in electricity demand or impacts to demand for public services would be less than significant. The changes to the Happy Valley Pipeline project proposed in this SEIR would not alter the impact analysis conclusions for this resource area. Applicable mitigation measures to reduce potential public services and utilities impacts identified in the WTTIP EIR are incorporated into the MMRP for the project (Appendix A).

CHAPTER 4.0
Project Alternatives

This chapter contains the following sections:

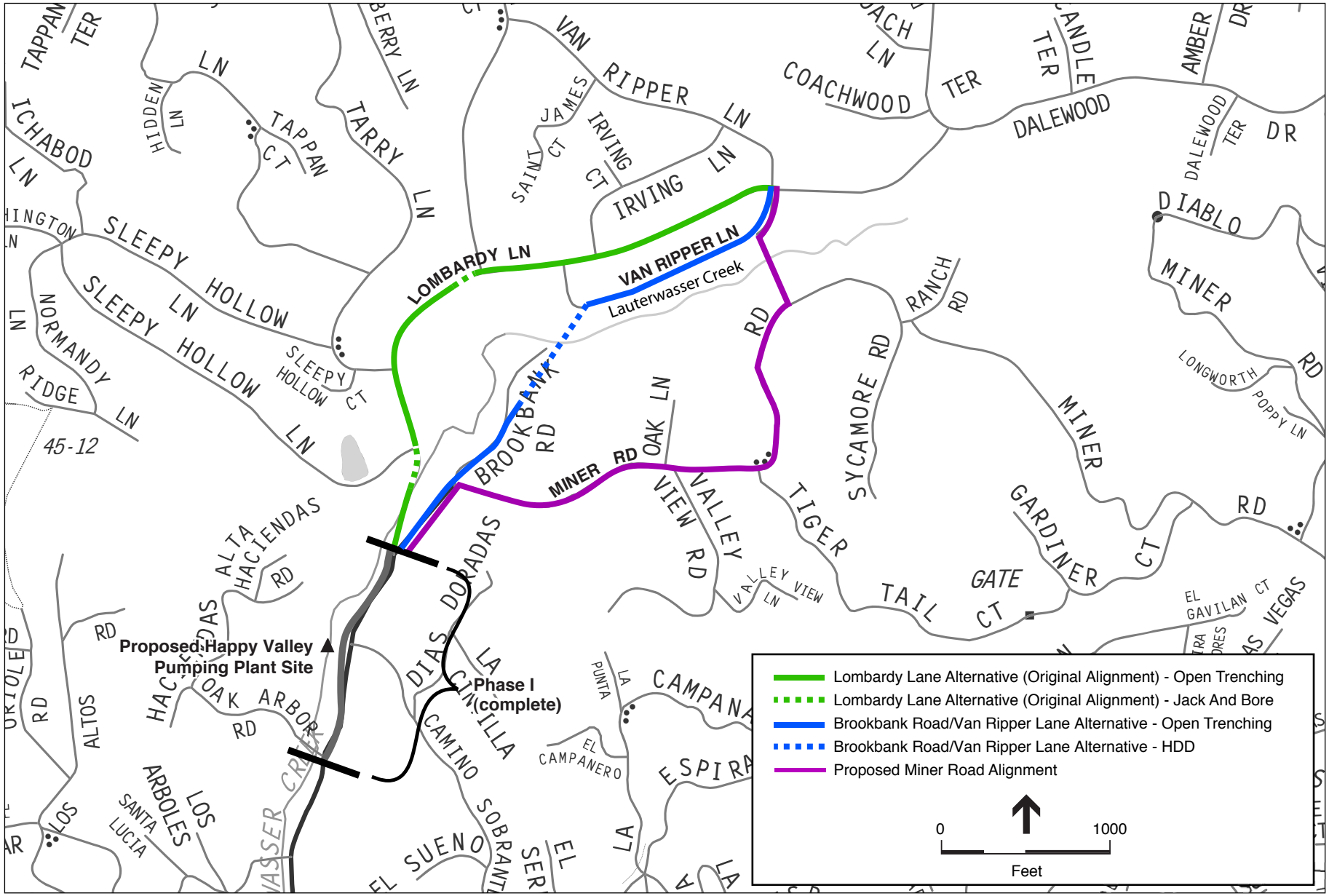
4.1 Introduction

The purpose of the alternatives analysis in an EIR is to describe a range of reasonable alternatives to the proposed project, or to the location of the Project, that could feasibly attain most of the objectives of the proposed project. Section 15126.6 of the CEQA Guidelines requires the lead agency to identify alternatives that would avoid or substantially lessen any of the significant adverse effects of the proposed project, and to evaluate the comparative merits of the alternatives (CEQA Guidelines, Section 15126.6). This may include those alternatives that could be more costly, or otherwise impede to some degree the attainment of certain project objectives. The lead agency is also required to analyze the "no project" alternative in order to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the project. In addition, this SEIR considers three "build" alternatives:

Lombardy Lane Alternative. The Lombardy Lane Alternative is the route of the Happy Valley Pipeline project that was approved as part of the WTTIP (see Figure 4-1). However, EBMUD entered into an agreement with the City of Orinda, whereby EBMUD would investigate options to minimize road closures during construction, which led to the currently proposed project. This SEIR revisits the Lombardy Lane Alternative to provide decision-makers and the public with a side-by-side comparison of the two alignments and to describe the environmental trade-offs between the two.

Brookbank Road/Van Ripper Lane Alternative. With this alternative, the pipeline would follow Miner Road and Brookbank Road cross under Lauterwasser Creek and extend along Van Ripper Lane.

No Road Closure Alternative. This alternative considers construction of the proposed project without the proposed road closures.



SOURCE: EBMUD, 2010

Happy Valley Pipeline SEIR . 204369.02

Figure 4-1

Happy Valley Pipeline Alternatives

4.2 No Project Alternative

4.2.1 Description

The CEQA Guidelines[1] require that an EIR describe and analyze current environmental conditions as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans. Under the No Project Alternative, the proposed Happy Valley Pipeline would not be constructed. While repair and maintenance of the existing facilities would continue to occur, no existing pipeline segments would be replaced or improved.

4.2.2 Environmental Impacts

If the Happy Valley Pipeline was not constructed, none of the environmental impacts associated with the proposed project would occur. Assuming existing conditions were to persist, the need for the proposed project would not be met. As identified in Section 2.2.3 (in Chapter 2 of this SEIR), the proposed project is needed to address inadequacies in pumping and transmission capacity in the Las Aromas Pressure Zone (PZ). The existing distribution system is made up of relatively small diameter pipelines, resulting in poor hydraulic connectivity between reservoirs. The current pumping capacity into the Las Aromas PZ is inadequate to meet both current and future maximum-day water demands. An additional 3.2 mgd of pumping capacity is required to meet forecast maximum-day demand conditions in 2030 (the planning horizon for the WTTIP) and maintain storage in Happy Valley Reservoir. Another benefit of the proposed alignment would include replacement of any aging “backbone” pipeline. The segment of backbone pipeline that crosses Lauterwasser Creek is the only water supply connection between Happy Valley Reservoir and some residences in the vicinity of Miner Road. The backbone pipe segment across Lauterwasser Creek has a history of leaking and would require future replacement irrespective of the need to increase supply to the Happy Valley Reservoir. If the Happy Valley Pipeline project is not implemented, the District’s ability to meet peak summertime water demand would continue to be constrained by the lack of pumping capacity. As water demand increases in the future, the District’s ability to meet the demand would diminish. In the short term, the District’s system operators would need to draw down storage in the Happy Valley Reservoir, reducing supplies meant to be available for emergencies. This strategy would not be tenable in the long term because it would compromise supplies for firefighting and other emergencies.

In order to meet its obligations to provide adequate water service to its customers, EBMUD would have to implement other strategies to meet these needs, or would simply implement the Lombardy Lane Alternative, which has already been approved by the EBMUD Board of Directors.

[1] CEQA Guidelines Section 15126.6(e).

4.3 Lombardy Lane Alternative

4.3.1 Description

The Lombardy Lane Alternative extends from the Miner Road/Lombardy Lane intersection up Lombardy Lane to the more easterly intersection of Lombardy Lane and Van Ripper Lane. This alternative is 3,900 feet long (Figure 4-1).

Construction of the Lombardy Lane Alternative would be done using open trenching for most of the alignment, as well as jack-and-bore undercrossings at two creek culverts (Lauterwasser Creek and Tarry Creek).

The construction period (not including pre-construction activities or down time) for the Lombardy Lane Alternative would be approximately 26 weeks, and construction would be expected to proceed at the rate of 12 feet per day between Miner Road and Sleepy Hollow Lane (jack-and-bore construction at Lauterwasser and Tarry Creeks would take four weeks at each location), and 40 to 60 feet per day between Sleepy Hollow Lane and Van Ripper Lane. The construction corridor for the segment between Miner Road and Sleepy Hollow Lane would be 20 feet and the construction corridor for the segment between Sleepy Hollow Lane and Van Ripper Lane would be 12 feet. The entire construction corridor would consist of public right-of-way, and no easements would be required.

During the construction of the segment between Miner Road and Sleepy Hollow Lane, which would last for approximately 8 weeks (excluding down time), Lombardy Lane would be closed to through traffic during construction hours (emergency vehicles excepted). During the construction of the segment between Sleepy Hollow Lane and Van Ripper Lane, only one lane would be closed to traffic, and vehicles would be able to travel the length of Lombardy Lane. Consistent with the assumptions in the WTTIP EIR, this SEIR assumes standard work hours of 7:00 a.m. to 6:00 p.m., with construction in roadways occurring from 8:30 a.m. to 4:30 p.m.

4.3.2 Environmental Impacts

Land Use, Planning, and Recreation

Similar to the proposed pipeline route on Miner Road, the Lombardy Lane alignment is located in a residential area and temporary disruptions to homeowner access would occur. Approximately 46 homes are located directly adjacent to the pipeline route. In addition, Sleepy Hollow Elementary School is accessed from Lombardy Lane via Sleepy Hollow Lane. Construction along Lombardy Lane could result in disruptions of access to the school. While mitigation is identified in the WTTIP EIR to address this impact (Measure 3.8-1), the level of land use impacts would be slightly greater under this alternative. Similar to the proposed project, impacts on agricultural resources and recreation resources would be less than significant.

Visual Quality

The Lombardy Lane Alternative would avoid impacts to scenic resources. Because the pipeline would be constructed entirely within an existing roadway, the magnitude of visual impacts would be less relative to the proposed alignment, which would require the removal of trees within the District's ROW, and would require modifications to the bed and bank of Lauterwasser Creek. Under this alternative, construction within roadways could affect trees located along the roadways due to root damage. However, with implementation of WTTIP EIR Measure 3.6-1a, which ensures that affected trees are monitored and replaced if necessary, potential changes in the roadways from root damage would not substantially affect views.

Geology, Soils and Seismicity

Construction of the Lombardy Lane Alternative would avoid construction within the steep banks of Lauterwasser Creek and others areas with steep slopes. Because the pipeline would be buried in the roadway, it would not be affected by landslide deposits that exist in the area. Potential impacts from slope stability would be mitigated to a less-than-significant level with implementation of WTTIP EIR Measure 3.4-1, which requires incorporation of geotechnical measures to ensure slope stability. Overall, the magnitude of potential slope stability and soil erosion impacts is less with this alternative than with the proposed alignment.

Hydrology and Water Quality

The Lombardy Lane alignment crosses Lauterwasser Creek and three tributary intermittent drainages including, Tarry Creek, an unnamed drainage near the Lombardy Lane and Van Ripper Lane intersection, and an unnamed seasonal drainage near the Camino Sobrante and Miner Road intersection (WTTIP EIR, Maps C-HVPP-1 through C-HVPP-3). The WTTIP EIR includes mitigation to avoid construction within these streams, by using jack-and-bore construction or otherwise confining construction activities (Measure 3.6-2a). As a result, compared to the proposed alignment (which would require open-trench construction within Lauterwasser Creek), this alternative would result in fewer potential impacts to hydrology and water quality.

Biological Resources

Because the Lombardy Lane alignment is located entirely within the roadway, fewer disturbances to sensitive habitats would occur relative to the proposed alignment. Some damage to trees could occur as the result of trenching within the root zones; however no trees or shrubs would need to be removed. Potential impacts to trees would be mitigated to a less-than-significant level with implementation of tree protection measures identified in the WTTIP EIR (Measure 3.6-1a-d). As identified under hydrology and water quality, construction within streams would be avoided. Overall, the severity of impacts to biological resources would be less with this alternative than with the proposed alignment.

Cultural Resources

Cultural resource database searches conducted for the WTTIP EIR and this SEIR have identified one prehistoric archaeological site within ½ mile of the proposed alignment. The site consists of two isolated lithic points. No significant historic architectural resources are expected to exist in the project area. Because the Lombardy Lane alignment is located within the existing roadway, the affected area has already been disturbed and it is unlikely that previously undisturbed cultural resources remain in the roadbed. However, because substantial excavation would be needed for the jack-and-bore pits near creeks that are considered moderately sensitive for containing cultural resources, the potential for impacts nonetheless exists. Potential impacts to cultural resources would be mitigated to a less-than-significant level with implementation of WTTIP EIR Measure 3.7-1a, which identifies measures to be taken for the inadvertent discovery of cultural materials. This alternative would result in a similar level of potential impacts cultural resources as the proposed project.

Traffic and Circulation

Construction of the Lombardy Lane Alternative would result in a higher level of impacts due to the higher traffic volume on the road. The Lombardy Lane route has approximately three times as much traffic as proposed alignment. As identified in Table 3.2.7-1, Lombardy Lane has approximately 3,400- 3,565 vehicles per day, whereas Miner Road (beyond the Lombardy Lane intersection) has approximately 950-1,060 vehicles per day. Construction of the Lombardy Lane alignment would require full road closure, and as a result, more traffic would be delayed and detoured under this alternative. Access to the Sleepy Hollow Elementary School from Lombardy Lane would be adversely affected. This impact could be mitigated by scheduling pipeline construction on the affected segment of Lombardy Lane during summer months when there is less activity at schools (Measure 3.8-6-HVPL). No impacts to public transit service would occur as no buses run on Lombardy Lane. Overall, this alternative has a higher level of impacts to traffic and circulation relative to the proposed project.

Air Quality

Construction of the Lombardy Lane Alternative would result in a slightly higher level of air quality impacts as compared to the proposed project. This alternative would result in the construction of 3,900 feet of new pipeline, compared to 3,300 feet of new pipeline for the proposed Miner Road alignment. The longer alignment would result in relatively more excavation, material handling, and construction, which in turn would require additional truck trips and heavy equipment use and increase the amount of air emissions associated with the use of trucks and equipment. While mitigation measures identified in the WTTIP EIR (Measures 3.9-1a through 3.9-1c) would reduce impacts to a less-than-significant level, construction emissions would be slightly higher under this alternative.

Noise and Vibration

This alternative would consist primarily of open-trench construction with two jack-and-bore creek undercrossings that have the potential to result in significant noise and vibration impacts to nearby residences. Open trench construction would subject adjacent residences to daytime pipeline construction noise that would exceed the 70-dBA speech interference criterion, with each residence exposed to approximately two weeks of construction noise. Compliance with Orinda Noise Ordinance construction hours and noise controls (Measure 3.10-1a-HVPL and Measure 3.10-1b-HVPL) would reduce this impact to a less-than-significant level. WTTIP EIR Measure 3.10-1d (DEIR p.3.10-33) requires that proposed jack-and-bore pits be located as far from sensitive receptors as technically feasible. The jacking pit for the Lauterwasser Creek crossing is estimated to be less than 100 feet from a residence at Lombardy Lane and Sleepy Hollow Lane. The jacking pit for the Tarry Creek crossing is estimated to be less than 50 feet from a residence at Van Tassel and Lombardy Lane. The duration of construction activities at each of the two jack-and-bore culvert crossings is estimated to be four weeks. WTTIP EIR Measure 3.10-3a (DEIR p.3.10-40) requires that the construction specifications limit surface vibration from activities like sheetpile driving to 0.5 inches per second peak particle velocity, which addresses potential cosmetic or structural damage to adjacent or nearby structures. Overall, the Lombardy Lane alignment would result in a lower level of noise and vibration impacts as compared to the proposed project. Both the proposed project and the Lombardy Lane Alternative would result in a prolonged duration of construction activities at specific locations along the respective construction routes. However, while this alternative would have work hours that comply with the Orinda Noise Ordinance construction hour limits (8:00 a.m. to 6:00 p.m.), the proposed project would have construction hours that extend to 9:00 p.m., resulting in a significant and unavoidable impact.

Greenhouse Gas Emissions

The Lombardy Lane Alternative would result in the construction of 3,900 feet of new pipeline, compared to 3,300 feet of new pipeline for the proposed Miner Road alignment. As a result, Greenhouse Gas (GHG) construction emissions would be slightly higher under this alternative. As with the proposed project, emissions would be considered to be less than significant as no construction-related GHG significance thresholds have been adopted by the Bay Area Air Quality Management District (BAAQMD). As identified for the proposed project, the District would incorporate BAAQMD-recommended best management practices (BMPs) into the contract specifications to reduce GHG emissions to the extent feasible.

4.4 Brookbank Road/Van Ripper Lane Alternative

4.4.1 Description

The Brookbank Road/Van Ripper Lane Alternative includes several segments. The first segment of the alignment extends from the Miner Road/Lombardy Lane intersection up Miner Road to Brookbank Road, at which point the pipeline extends northeast to the end of Brookbank Road. The next segment starts at the end of Brookbank Road and ends in front of 117 and 119 Van

Ripper Lane. The final segment starts in the roadway in front of 117 and 119 Van Ripper Lane and ends at the more easterly Van Ripper Lane/Lombardy Lane intersection.

Construction of the Brookbank Road/Van Ripper Lane Alternative would be done using open-trench construction for most of the alignment, and horizontal directional drilling (HDD) to cross under Lauterwasser Creek. The pipe depth beneath the structural elements of the two residences on Van Ripper Lane and horizontal alignment relative to the houses (i.e., the slant distance) have not yet been determined but is expected to be less than 40 feet (HDD would terminate in Van Ripper Lane in front of these residences).

The construction period (not including down time) for this alternative would be approximately 13 weeks; the construction period for the HDD segment would be approximately four weeks. Construction would be expected to proceed at the rate of 60-80 feet per day within roadways and 30 feet per day within the cross-country segment. The construction corridor for the segments within roadways would be 12 feet, and the construction corridor for the HDD operation on Brookbank Road would be 30 feet[2]. The portions of the alignment that are in the roadways would be within public right-of-way. The portion of the alignment between Brookbank Road and Van Ripper Lane would require that EBMUD acquire temporary construction and permanent easements from the owners of 10 Lombardy Lane, 117 Van Ripper Lane, and 119 Van Ripper Lane.

Construction of this alternative would require full road closures (except emergency vehicles) during construction hours of affected portions of Miner Road, Brookbank Road and Van Ripper Lane. Only roadway segments under construction would be closed. As construction proceeds along roadways, affected segments would be closed. Once construction of a segment is completed, access to that segment would be restored. This analysis assumes standard work hours of 7:00 a.m. to 6:00 p.m., with construction in roadways occurring from 8:30 a.m. to 4:30 p.m.

4.4.2 Environmental Impacts

Land Use, Planning, and Recreation

Similar to the proposed pipeline route, the Brookbank Road/Van Ripper Lane alignment is located in a residential area. Approximately 38 homes are located directly adjacent to the pipeline route. Construction of the pipeline would result in temporary disruptions in access to these homes. While this alternative would require the District to obtain temporary and permanent easements for the cross-country segment of this alignment, this alternative would not divide an established community or result in long-term land use impacts. Because no construction would occur on Lombardy Lane, no disruptions in access to the Sleepy Hollow Elementary School would occur. Similar to the proposed project, impacts on agricultural resources and recreation resources would be less than significant.

[2] The HDD operation will also require the assembly of 300-500 feet of pipeline in Van Ripper Lane, temporarily placed in the same trench with the new permanent pipe that connects at Lombardy Lane.

Visual Quality

The Brookbank Road/Van Ripper Lane Alternative would avoid impacts to scenic resources. Because the pipeline would be constructed entirely within existing roadways, the magnitude of visual impacts would be less relative to the proposed alignment, which would require the removal of trees within the District's ROW. Visual impacts to Lauterwasser Creek and surrounding vegetated areas would be avoided with the HDD undercrossing. As a result, this alternative would result in a slightly fewer impacts compared to the proposed alignment, which would require the removal of some trees within the District's ROW. Construction within roadways could affect trees located along the roadways due to root damage, however with implementation of WTTIP EIR Measure 3.6-1a, which ensures that affected trees are monitored and replaced if necessary, potential changes in the roadways from root damage would not substantially affect views.

Geology, Soils and Seismicity

Construction of the Brookbank Road/Van Ripper Lane Alternative would avoid construction within the steep banks of Lauterwasser Creek and others areas with steep slopes. This alignment would cross beneath Lauterwasser Creek and adjacent slopes using HDD. Because the pipeline would be drilled below the creek and slopes, potential slope stability and soil erosion impacts would be avoided. As with the proposed project, recommendations from a site-specific geotechnical investigation would be incorporated into the design and made part of contract specifications. Overall, the magnitude of potential slope stability and soil erosion impacts is less with this alternative than with the proposed alignment.

Hydrology and Water Quality

This alternative avoids construction activities in the creek; however, there is a potential for water quality degradation from drilling under Lauterwasser Creek due to "frac-outs." HDD typically uses a gel mud to transport drilled spoil, reduce friction and stabilize the bore-hole. The gel mud is typically composed of a mixture of water and bentonite (clay-based drilling lubricant) or alternative drilling lubricant. A frac-out occurs when the drilling mud is forced vertically to the ground surface. This drilling mud has the potential to enter the creek and impact water quality. Potential impacts could be mitigated to a less-than-significant level by completing a site-specific geotechnical investigation and implementing a frac-out contingency plan, specifying safe work practices, monitoring requirements for HDD operations, and procedures to minimize environmental effects should a frac-out occur. Groundwater dewatering would not likely be required. The pipeline for this alternative would also cross over a culvert in Brookbank Road for an unnamed creek channel using open cut trenching, but the trenching would be in the road with no impacts to the culvert expected. Overall, because the construction work in the creek would be less intensive and because the alteration of future flows in the creek would be lower, the magnitude of potential hydrology and water quality impacts under this alternative would be less than that of the proposed alignment.

Biological Resources

Construction of the Brookbank Road/Van Ripper Lane Alternative would occur primarily within existing roadways. The Lauterwasser Creek segment would be constructed using HDD thereby avoiding direct impacts to sensitive habitat. It is expected that no trees or shrubs would need to be removed, however some damage to trees could occur as the result of trenching within the root zone of trees. Potential impacts to trees would be mitigated to a less-than-significant level with implementation of tree protection measures identified in the WTTIP EIR (Measure 3.6-1a-d). Construction within Lauterwasser Creek would be avoided; however, a frac-out could adversely affect in-stream resources. Potential impacts from a frac-out could be mitigated to a less-than-significant level by completing a site-specific geotechnical investigation and implementing a frac-out contingency plan. Overall, the magnitude of potential biological impacts under this alternative is less that of the proposed alignment.

Cultural Resources

Cultural resource database searches conducted for the WTTIP EIR and this SEIR have identified one prehistoric archaeological site within ½ mile of the proposed project. The site consists of two isolated lithic points. No significant historic architectural resources are expected to exist in the project area. Because the Brookbank Road/Van Ripper Lane alignment is located primarily within existing roadways, the affected area has already been disturbed and it is unlikely that cultural resources remain in the project area. Construction of the cross-country segment using HDD would result in subsurface disturbance near Lauterwasser Creek, which is considered to be moderately sensitive for cultural resources. With implementation of mitigation identified in the WTTIP EIR (Measure 3.7-1a), this impact would be reduced to a less-than-significant level. No historic structures are known to exist in the project area. Overall, this alternative would result in similar level of impacts to cultural resources.

Traffic and Circulation

Construction of the Brookbank Road/Van Ripper Lane Alternative would result in a lower level of impacts in comparison to the proposed project. Construction would occur within Brookbank Road, Van Ripper Lane, and Miner Road. Construction would require full road closure along the affected segments of these roads, with most construction occurring on Brookbank Road and Van Ripper Lane. Because no through traffic is provided on Brookbank Road, and because either end of Van Ripper Lane can be accessed from Lombardy Lane, closure of these roads during construction would affect fewer residents and be easier to bypass. Potential impacts to public transit service along Miner Road would be reduced with implementation of Measure 3.8-6-HVPL, which requires road closure of Miner Road to occur in summer months when schools served by Country Connection Route 606 are not in session.

Air Quality

Construction of the Brookbank Road/Van Ripper Lane Alternative would result in a similar level of air quality impacts as the proposed project. This alternative would result in the construction of

approximately 3,400 feet of new pipeline, compared to 3,300 feet of new pipeline for the proposed Miner Road alignment. Mitigation measures identified in the WTTIP EIR (Measures 3.9-1a-c) would reduce impacts to a less-than-significant level.

Noise and Vibration

Construction of the Brookbank Road/Van Ripper Lane Alternative would result in a slightly lower level of noise and vibration impacts in comparison to the proposed project. This alternative would consist primarily of open-trench construction with an HDD undercrossing of Lauterwasser Creek. Open trench construction would subject adjacent residences to daytime pipeline construction noise that would exceed the 70-dBA speech interference criterion, with each residence exposed to approximately two weeks of construction noise. HDD construction would subject residences adjacent to the staging areas to construction noise for up to four weeks. There are two residences within 150 feet of the Brookbank Road staging area and up to seven residences within 100 feet of the Van Ripper Lane staging area. These residences could be impacted by construction noise during daytime and early evening hours. Compliance with Orinda Noise Ordinance construction hours and noise controls (WTTIP EIR Measures 3.10-1a and 3.10-1b) would reduce noise impacts to a less-than-significant level.

There would also be a potential for cosmetic or structural damage due to drilling-related vibration at two residences on Van Ripper Lane, where the HDD alignment would be located as close as 10-15 feet below houses. As stated in the WTTIP EIR, depending on the age and condition of residential buildings as well as subsurface conditions, peak particle velocities of 2.0 inches per second (in/sec) can cause structural damage, while peak particle velocities of 0.5 in/sec can cause cosmetic damage. Although the contractor could be required to limit surface vibrations at these structures to no more than 0.5 in/sec PPV (Measure 3.10-3a-HVPL), the feasibility of meeting this criterion is unknown. A geotechnical investigation to characterize subsurface soil conditions, coupled with a more detailed evaluation of HDD vibration characteristics and an accurate measurement of the distance of residential structures/foundations to construction would be required. Peak particle velocities as low as 0.01 in/sec can also cause annoyance, and HDD drilling activities could cause temporary annoyance at adjacent or nearby residential receptors. Overall, the magnitude of potential noise and vibration impacts under this alternative is less than that of the proposed alignment. Both the proposed project and the Brookbank Road/Van Ripper Lane Alternative would result in a prolonged duration of construction activities (about one month) at specific locations along the respective construction routes. However, while this alternative would have work hours that comply with the Orinda Noise Ordinance construction hours (8:00 a.m. to 6:00 p.m.), the proposed project would have construction hours that extend to 9:00 p.m., resulting in a significant and unavoidable impact.

Greenhouse Gas Emissions

The Brookbank Road/Van Ripper Lane Alternative would result in the construction of 3,400 feet of new pipeline, compared to 3,300 feet of new pipeline for the proposed alignment. As a result, Greenhouse Gas (GHG) construction emissions would be similar under this alternative. As with the proposed project, emissions would be considered to be less than significant as no construction-

related GHG significance thresholds have been adopted by the BAAQMD. As identified for the proposed project, the District would incorporate BAAQMD-recommended BMPs into the contract specifications to reduce GHG emissions to the extent feasible.

4.5 No Road Closure Alternative

4.5.1 Description

The No Road Closure Alternative consists of construction of the Happy Valley Pipeline as described under the proposed project without full road closure. Under this alternative, only one lane of Miner Road and Van Ripper Lane would be closed to traffic, thereby allowing vehicles to travel the length of affected roadways. All construction details would be the same as under the proposed project, however, keeping one lane open would reduce the working area and the efficiency of the construction process. As a result, construction is expected to take longer, resulting in an overall construction period of four months. Consistent with the proposed project, this analysis assumes that construction within roadways would occur between 9:00 a.m. and 9:00 p.m., with construction in the cross-country ROW occurring between 8:00 a.m. and 6:00 p.m.

4.5.2 Environmental Impacts

The No Road Closure Alternative would result in generally similar impacts as the proposed project, as in most respects the project is identical to the proposed project. However, maintaining an open lane of traffic would prolong the construction period and therefore prolong the experience of impacts that would occur. Residents along the pipeline alignment would be subjected to longer periods of noise and dust generating construction activities near their homes as construction would proceed more slowly along the route. Traffic impacts would be less severe during construction, as one lane would remain open to traffic and local residents would have fewer disruptions in roadway access. However, construction would continue for an additional month and traffic delays due to restricting the roadway to one lane would occur over a longer period. Overall, this alternative would result in similar level of environmental impacts as compared to the proposed project.

4.6 Other Alternatives Considered but Rejected

4.6.1 Expansion of Existing Pumping Plants and Pipelines

The proposed project addresses inadequacies in pumping and transmission capacity in the Las Aromas Pressure Zone (PZ). An alternative to the Happy Valley Pumping Plant and Pipeline was considered during the District's pressure zone planning program and presented in the WTTIP EIR (Chapter 6, page 6-61 – 6-62). This alternative involved expanding the other pumping plants serving the Las Aromas PZ: Sleepy Hollow (located 600 feet north of 53 Los Altos Drive in Orinda), Valory (located on the corner of Happy Valley Road and Palo Alto Drive in Lafayette) and Las Aromas (located at 32 Las Aromas in Orinda). However, site constraints and/or hydraulic issues at each of the pumping plants would make this difficult, if not impossible. For instance, an Environmental Impact Report prepared in the 1980s analyzed possible expansion of the Las Aromas Pumping Plant and determined

that the site is limited and could not accommodate a suitable expansion. None of the Las Aromas PZ pumping plants alone could be expanded enough to provide adequate pumping capacity to the Las Aromas PZ. As a result, a combination of pumping plants would have to be upgraded (resulting in construction-related impacts at multiple locations), and pipeline improvements totaling approximately 1.9 miles in narrow streets and rights-of-way would be needed as well. This alternative was rejected as these improvements were expected to be more costly and would likely result in a greater level of environmental impacts. Given the location of these pumping plants and pipeline alignments, the number of residents in proximity to the sites, implementation of this alternative would likely result in similar impacts to those associated with the Happy Valley Pipeline Project (either pipeline alignment) but would affect many more people and for a longer period of time.

4.6.2 Pipe Bridge

The District considered the feasibility of constructing a pipe bridge over Lauterwasser Creek within the existing District ROW between Miner Road and Van Ripper Lane. Under this alternative, a supported segment of pipe would span Lauterwasser Creek from the top of the creek banks. This alternative would have the benefit of avoiding construction directly within Lauterwasser Creek and open trenching within the steep banks. However, several issues precluded this option from detailed development and evaluation. First, the District would need to obtain an additional easement to construct an aboveground pipeline, which landowners may be unwilling to grant. Second, the pipe bridge could create a safety hazard as individuals could gain access to the pipe bridge and potentially fall and injure themselves. Lastly, neighboring landowners have expressed opposition to a pipe bridge because it would detract from their view of an otherwise natural area. The District determined that the safety hazard and landowner concerns outweigh the benefits of this alternative.

4.6.3 Construction within both Lombardy Lane and Miner Road

During the scoping process, one community member suggested that the Lauterwasser Creek segment of the existing pipeline be abandoned in favor of a route entirely within public roadways. For this alternative, the pipeline would be installed in Lombardy Lane following the original alignment in the WTTIP EIR and in Miner Road between the Miner Road/Lombardy Lane intersection and the Miner Road/Tiger Tail Court intersection. This alternative would have the benefit of avoiding construction within Lauterwasser Creek, and because the pipeline would be located wholly within the roadways, future access for maintenance and repair would be easier than access in the District's ROW. The District considered this alternative but eliminated it from further analysis for two reasons. First, because the pipeline would be approximately twice the length of the proposed pipeline, the pipeline would cost roughly twice as much as the proposed project. Second, while the alternative would avoid impacts in the vicinity of Lauterwasser Creek and would substantially lessen impacts to residents adjacent to the District's ROW, this alternative would result in additional traffic, noise and dust impacts due to the expanded construction area along Lombardy Lane. Because of the expanded area and construction on Lombardy Lane, which has approximately three times as much traffic as proposed alignment, this alternative would result in a greater level of disturbance to local residents and the surrounding community.

4.7 Comparison of Alternatives

This section presents a comparison of the alternatives and identifies the environmentally superior alternative. Consistent with the CEQA Guidelines, Section 15126.6(a), the comparison of alternatives and determination of the environmentally superior alternative is based on the ability of the alternative to meet the basic objectives of the proposed project while avoiding or substantially lessening any significant impacts. This section presumes implementation of mitigation measures identified in the SEIR. **Table 4-1** provides a summary comparison of impacts for the proposed project and alternatives by impact classification (e.g. significant mitigable, less than significant). The No Project Alternative is not identified in Table 4-1 as no construction would occur and all associated impacts would be avoided.

4.7.1 Environmentally Superior Alternative

As discussed in Section 4.2, under the No Project Alternative no pipeline segments would be constructed or replaced. As a result, the No Project Alternative is considered to be environmentally superior to the "action" alternatives because none of the impacts associated with those alternatives would occur. While it would be the environmentally superior alternative, the No Project Alternative would not meet any of the projects objectives. According to CEQA Guidelines Section 15126.6(e)(2), when the no project alternative is identified as the environmentally superior alternative, the EIR must identify an environmentally superior alternative among the "build" alternatives. To determine which alternative is environmentally superior, the key distinguishing impacts of the alternatives were reviewed in the context of the following three general impact categories.

Biological Resources

Under all the alternatives, all biological resource impacts would be mitigated to a less-than-significant level. In general, all potential impacts to habitat and sensitive status species would be temporary as sites would be restored after construction. However, the proposed project would require the removal of 15 – 25 trees and potential trimming of 15 – 35 trees. The removal of trees would be avoided under the Lombardy Lane Alternative and the Brookbank Road/Van Ripper Lane Alternative as these alternatives would be constructed within existing roadways, and would only require tree trimming.

Lauterwasser Creek and Slope Stability

The proposed project includes the replacement of an existing pipeline that is located within the bed and banks of Lauterwasser Creek. This would be constructed by open trench method in a narrow ROW utilizing hand operated equipment. Impacts to Lauterwasser Creek include temporary impacts to water quality during construction and potential long-term changes in the configuration of the stream bed and bank that could affect the hydrology of the creek. Construction within the steep banks of Lauterwasser Creek has the potential to result in slope failure either during construction when the open trench is excavated, or in the long term if there is ground failure along the pipeline. These potential impacts would be mitigated to less-than-significant levels through design-level geotechnical evaluations to ensure that slope failure and

TABLE 4-1
COMPARISON OF IMPACTS OF ALTERNATIVES TO PROPOSED PROJECT

Impacts[a]	Proposed Project	Lombardy Lane Alternative[b]	Brookbank Road/Van Ripper Lane Alternative	No Road Closure Alternative
Land Use, Planning, and Recreation				
Divide an Established Community	SM	SM+	SM=	SM=
Agricultural Resources Impacts	LTS	LTS=	LTS=	LTS=
Recreation Resources Impacts	LTS	LTS=	LTS=	LTS=
Visual Quality				
Short-Term Visual Effects during Construction	LTS	LTS=	LTS=	LTS=
Alteration of Appearance of WTTIP Sites	SM	LTS-	LTS-	SM=
Effects on Views	SM	LTS-	LTS-	SM=
Effects on Scenic Vista	SM	LTS-	LTS-	SM=
New Sources of Light and Glare	LTS	LTS+	LTS+	LTS+
Geology, Soils and Seismicity				
Slope Stability	SM	SM-	SM-	SM=
Ground-shaking	SM	SM=	SM=	SM=
Expansive Soils	SM	SM=	SM=	SM=
Liquefaction	SM	SM=	SM=	SM=
Squeezing Ground	--	--	--	--
Subsidence	--	--	--	--
Erosion or loss of topsoil	SM	SM-	SM-	SM=
Hydrology and Water Quality				
Degradation of Water Quality during Construction	SM	SM-	SM=	SM=
Groundwater Dewatering	LTS	LTS-	LTS=	LTS=
Diversion of Flood Flows	SM	SM=	LTS-	SM=
Discharge of Chloraminated Water during Construction	LTS	LTS=	LTS=	LTS=
Operational Discharge of Chloraminated Water	--	--	--	--
Change in Impervious Surfaces	LTS	LTS=	LTS=	LTS=
Alteration of Long-Term Drainage Patterns	SM	SM-	SM-	SM=
Long-term Degradation of Water Quality	LTS	LTS=	LTS=	LTS=
Biological Resources				
Loss of or Damage to Protected Trees	SM	SM-	SM-	SM=
Degradation to Streams, Wetlands, and Riparian Habitats	SM	SM-	SM=	SM=
Loss or Damage to Special-Status Plants	SM	SM-	SM-	SM=
Disturbance to Special-Status Birds	SM	SM-	SM-	SM=
Disturbance to Special-Status Bats	SM	SM-	SM-	SM=
Disturbance to San Francisco Dusky-Footed Woodrat	SM	SM-	SM-	SM=
Degradation of Special-Status Aquatic Species Habitat	SM	SM-	SM=	SM=
Disruption to Wildlife Corridors	LTS	LTS-	LTS-	LTS=
Adverse Effects to Alameda Whipsnake	SM	LTS-	LTS-	SM=
Cultural Resources				
Archaeological Resources, including Unrecorded Cultural Resources	SM	SM=	SM=	SM=
Paleontological Resources	SM	SM-	SM=	SM=
Historic Settings	LTS	LTS-	LTS=	LTS=
Traffic and Circulation				
Increased Traffic	SM	SM+	SM=	SM-
Reduced Road Width	SM	SM+	SM=	SM-
Parking	SM	SM+	SM=	SM-
Traffic Safety	SM	SM+	SM=	SM-

[a] Impacts summarized; please see Chapter 3 for details.
[b] Some differences exist between impact determinations presented here and in WTTIP EIR

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

\+ Impact would be greater than with the proposed project
– Impact would be less than with the proposed project
= Impact would be the same (or similar) as the proposed project

TABLE 4-1 (Continued)
COMPARISON OF IMPACTS OF ALTERNATIVES TO PROPOSED PROJECT

Impacts[a]	Proposed Project	Lombardy Lane Alternative[b]	Brookbank Road/Van Ripper Lane Alternative	No Road Closure Alternative
Traffic and Circulation (cont.)				
Access	SM	SM+	SM-	SM-
Transit	SM	LTS-	SM-	SM-
Pavement Damage/Wear	SM	SM=	SM=	SM-
Air Quality				
Construction Emissions	SM	SM+	SM=	SM=
Diesel Particulate Emissions along Haul Routes	LTS	LTS+	LTS=	LTS=
Tunnel-Related Emissions	--	--	--	--
Operational Pollutant Emissions at Treatment Facilities	--	--	--	--
Operational Odor Emissions	LTS	LTS=	LTS=	LTS=
Secondary Emissions from Electricity Generation	LTS	LTS=	LTS=	LTS=
Noise and Vibration				
Construction Noise Increases	SU	SM-	SM-	SU=
Noise Increases along Haul Routes	LTS	LTS=	LTS=	LTS=
Construction-Related Vibration Effects	SM	SM=	SM=	SM=
Operational Noise Increases	LTS	LTS=	LTS=	LTS=
Greenhouse Gas				
Construction Emissions	LTS	LTS=	LTS=	LTS=
Hazards and Hazardous Materials				
Hazardous Materials in Soil and Groundwater	SM	SM=	SM=	SM=
Hazardous Building Materials	--	--	--	--
Gassy Conditions in Tunnels	--	--	--	--
High-Pressure Gas Line Rupture	SM	SM=	SM=	SM=
Wildland Fires	LTS	LTS=	LTS=	LTS=
Release from Construction Equipment	LTS	LTS=	LTS=	LTS=
Accidental Release during Operation	--	--	--	--
Public Services and Utilities				
Disruption of Utility Lines	SM	SM=	SM=	SM=
Increase in Electricity Demand	LTS	LTS=	LTS=	LTS=
Increase in Public Services Demand	LTS	LTS=	LTS=	LTS=
Adverse Effect on Landfill Capacity	SM	SM=	SM=	SM=
Failure to Achieve State Diversion Mandates	SM	SM=	SM=	SM=

[a] Impacts summarized; please see Chapter 3 for details.
[b] Some differences exist between impact determinations presented here and in WTTIP EIR

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

\+ Impact would be greater than with the proposed project
– Impact would be less than with the proposed project
= Impact would be the same (or similar) as the proposed project

erosion of the creek banks do not occur. However, under the Brookbank Road/Van Ripper Lane Alternative and the Lombardy Lane Alternative, construction would not occur directly within the bed and banks of Lauterwasser Creek or other creeks and these impacts could be avoided. The Brookbank Road/Van Ripper Lane Alternative would utilize HDD to cross under Lauterwasser Creek. While this alternative would avoid direct impacts to the creek and open trench construction within steep slopes, the possibility exists for a frac-out of drilling mud to enter Lauterwasser Creek and result in a temporary degradation of water quality. The Lombardy Lane Alternative would use jack-and-bore undercrossings at Lauterwasser Creek and Tarry Creek which pass under the roadway within existing culverts. As a result the Lombardy Lane Alternative would best avoid potential impacts to Lauterwasser Creek and would avoid construction within steep sloped areas.

Impacts to Residents

While the specific residents affected would vary by alternative, construction of the pipeline at any one location would result in disruption of access from construction in roadways, noise and vibration, and dust and exhaust. The alternatives would vary in the number of people affected and the duration and intensity of impacts, as follows:

Proposed Project. Approximately 39 homes (based on number of water service connections and review of aerials) are located directly adjacent to the segments of pipeline that would be constructed or replaced, and construction would last approximately 11 weeks. The proposed project would result in the full closure of affected segments of Miner Road, during which time local residents would be able to access their homes and emergency access would be provided, but no through traffic would be allowed during construction hours. Construction within the cross-country ROW segment would take approximately one month, and residents located directly adjacent to the ROW (85 and 89 Van Ripper Lane, 557 and 559 Miner Road) would be subjected to a longer period of disruption than residents along other portions of the pipeline alignment, who would be subjected to approximately two weeks of adjacent construction activities. The home at 557 Miner Road abuts the ROW and would be subjected to noise and vibration associated with the use of open-trench construction or pipe bursting technology. Most noise and vibration impacts would be mitigated to a less-than-significant level, however because construction in roadways is proposed to occur from 9:00 a.m. to 9:00 p.m., beyond the construction hour limited stipulated in the Orinda Noise Ordinance (8 a.m. to 6 p.m.), this would result in a significant and unavoidable impact.

Lombardy Lane Alternative. Approximately 46 homes (based on number of water service connections and review of aerials) are located directly adjacent to the pipeline corridor, and construction would last approximately 26 weeks. The Lombardy Lane Alternative would result in full closure of Lombardy Lane for approximately 8 weeks (excluding down time), but during the remaining time, one lane of the roadway would remain open. While the period of full road closure is less than that which would occur under the proposed project, Lombardy Lane has approximately three times the daily traffic volume as the proposed alignment. As a result a greater number of people would be affected during road closures. Similar to the proposed project, residents would be subjected to noise and vibration, and dust and exhaust from open-trench construction of the pipeline. Residents located near the two jack-and-bore culvert crossings (Lauterwasser Creek and Tarry Creek) are estimated to be affected for four weeks each (homes are located within 100 feet and 50 feet of the respective jacking pits). The

residents near the jacking pits would be subjected to a level of construction disturbance that is more intense and longer in duration than residents affected by open-trench construction in roadways. Unlike the proposed project, all noise and vibration impacts could be mitigated to a less-than-significant level, as this alternative would have work hours that comply with the Orinda Noise Ordinance construction hour limits.

Brookbank Road/Van Ripper Lane Alternative. Approximately 38 homes (based on number of water service connections and review of aerials) are located directly adjacent to the pipeline corridor, and construction would last approximately 13 weeks. This alternative would result in the full closure of the affected portions of Miner Road, Brookbank Road and Van Ripper Lane, during which time local residents would be able to access their homes and emergency access would be provided. Similar to the proposed project, residents would be subjected to noise and vibration, and dust and exhaust from open-trench construction of the pipeline. The HDD undercrossing of Lauterwasser Creek would also result in noise and vibration impacts to adjacent residents. There are two residences within 150 feet of the Brookbank staging area and up to seven residences within 100 feet of the Van Ripper Lane staging area that would be affected by construction for approximately one month. There would also be a potential for cosmetic or structural damage due to drilling-related vibration at two residences on Van Ripper Lane, where the HDD alignment would be located as close as 10-15 feet below the houses. The residents near the HDD alignment (particularly those directly adjacent on Van Ripper Lane) would be subjected to more intense construction impacts for a longer duration than residents adjacent to roadways where only open-trench construction would occur. Unlike the proposed project, all noise and vibration impacts could be mitigated to a less-than-significant level, as this alternative would have work hours that comply with the Orinda Noise Ordinance construction hour limits.

No Road Closure Alternative. Because this alternative is substantially the same as the proposed project, it would result in the same type and intensity of impacts as the proposed project. The only difference is that under this alternative, one lane of Miner Road would remain open during construction, allowing for alternate one-way traffic flow. This would lower the intensity of road closure impacts (e.g. traffic delays, limited access), but would prolong the period of impact from 11 weeks to 15 weeks.

While none of the alternatives would avoid all impacts to residents, and all the alternatives have there own inherent impacts, the Lombardy Lane Alternative is considered to be environmentally superior to the proposed project. Because the Lombardy Lane Alternative would be constructed entirely within an existing roadway and would avoid construction within the steep ravine of Lauterwasser Creek, a range of impacts would be avoided or lessened in severity. Tree removal, which is considered an impact to biological resources as well as visual resources, would be avoided. Because construction within Lauterwasser Creek would be avoided, potential impacts to water quality and slope stability would likewise be avoided. Localized construction-related disruption to adjacent residents would also be minimized under this alternative, as the closest and most intense impacts to residents under the proposed project (construction within the cross-country segment where homes abut the ROW) and the Brookbank Road/Van Ripper Lane Alternative (where directional drilling comes within 10-15 feet of two homes) would be avoided. In addition, unlike the proposed project, this alternative would have work hours that comply with the Orinda Noise Ordinance construction hour limits, thereby avoiding a significant and unavoidable noise impact.

Although the Lombardy Lane Alternative is identified as the environmentally superior alternative two key considerations compel the District to consider approval of the proposed project. First, while the Lombardy Lane Alternative would meet the project objectives in the short term, the existing pipeline crossing Lauterwasser Creek (most of which was constructed in 1946) is a well defined backbone pipe with a history of leaks and would need to be replaced in the future. The District will need to replace the backbone pipe eventually, meaning that the environmental impacts along the ROW would only be deferred and would occur in addition to impacts along Lombardy Lane should that alternative be implemented. Because the proposed project would replace the backbone pipeline across Lauterwasser Creek, it would better meet the project objectives by minimizing the risk of service disruption in the future and minimizing life-cycle costs to EBMUD customers by providing additional transmission capacity while replacing a segment of aging pipeline. Second, while the Lombardy Lane Alternative would have shorter daily construction hours than the proposed project, and would thus avoid a significant and unavoidable impact caused by exceeding the Orinda Noise Ordinance construction hour limits (8:00 a.m. to 6:00 p.m.), the extended hours identified for the proposed project would allow for a shorter overall construction period. For the proposed project, the District is proposing a longer construction period for work in roadways (9:00 a.m. to 9:00 p.m.) to reduce the overall duration of construction. Longer construction days will save approximately one month in the overall schedule and allow work to occur within a two to three month period. This has the additional benefit of reducing impacts to County Connection Bus Route 606, which provides school bus service along Miner Road. If shorter daily construction hours are adopted, then the overall duration of construction (and associated road closures) could not be contained during the school summer vacation period. Curtailing work hours on Miner Road could result in a significant and unavoidable impact to this transit service.

CHAPTER 5.0
Cumulative Impacts, Growth Inducement Potential, and Irreversible Environmental Changes

5.1 Cumulative Impacts

The State CEQA Guidelines (Section 15130) require a reasonable analysis of the significant cumulative effects of a proposed project or program. As allowed by Section 15130 (b) (1) (b) of the CEQA Guidelines, cumulative impacts assessments can be based on: (1) growth projections and associated public service improvement projects contained in adopted general plans or related planning documents; or, (2) a list of past, present, and probable future projects producing related or cumulative impacts. Environmental effects identified in prior certified environmental documents may also describe and/or evaluate regional or area-wide conditions contributing to the cumulative impacts. Like the WTTIP EIR, this SEIR largely uses a list-based approach. However with regard to greenhouse gas emissions, this SEIR follows methodology developed by the Bay Area Air Quality Management District (BAAQMD), which is based on determining the project's consistency with the regional clean air plan.

Due to the breadth and extent of the WTTIP projects, the WTTIP EIR (Chapter 5) provided an analysis of the collective impacts of all project-level and program-level WTTIP projects as well as the potential for overlap with other pertinent projects proposed and/or planned in the region. The collective impact discussion provided a synthesis of both project- and program-level impacts for all proposed WTTIP facilities, and indicated the potential for overlapping impacts associated with multiple projects proposed for construction within the same time frame and same geographic area. With respect to the Happy Valley Pumping Plant and Pipeline, the WTTIP EIR indicates that no other projects (other WTTIP projects) would be constructed in 2013 in the project area. Table 5-1 of the WTTIP EIR (beginning on p. 3.2-27 in the WTTIP FEIR) identified over 160 projects in the WTTIP area with potential for cumulative impacts.

For this SEIR, cumulative project information is based on information supplied by the City of Orinda, EBMUD, as well as information from other entities, and review of information posted on agency websites. The revised list is presented in **Table 5-1** of this SEIR.

The most noteworthy of the cumulative impacts identified in the WTTIP EIR were loss of protected trees, traffic congestion, increases in dust and other air quality pollutant emissions, and elevated noise levels. This SEIR focuses on whether the proposed changes in the Happy Valley

Pipeline project could, in conjunction with other projects, exacerbate any significant cumulative environmental effects.

5.1.1 Land Use

The geographic scope of potential land use impacts encompasses the project area and immediate vicinity, including proposed staging areas and detour routes. Cumulative impacts related to the division of the project area's established community could occur if the project areas and construction schedules of the proposed project and the potentially cumulative projects listed in Table 5-1 overlap. Of the projects listed in Table 5-1, the developments at 1 Sunnyside Lane and Altarinda Road are the closest projects to the proposed pipeline alignment (approximately one and two miles away, respectively). Both developments are in the planning phase and it is uncertain if these projects would overlap in schedule with the Happy Valley Pipeline project. All of the remaining cumulative projects that could have overlapping construction schedules with the project are located more than 2 miles away from the project area and would not contribute to potential cumulative impacts related to the physical division of an established community. Since the project would not introduce any land use changes, the project's contribution to cumulative impacts related to the physical division of an established community would not be considerable and would be less than significant.

Mitigation: None required.

5.1.2 Visual Resources

The geographic scope of potential cumulative visual impacts includes the project area and immediate vicinities. Cumulative visual impacts could occur if the proposed project and the projects identified in Table 5-1 involved tree removal, construction of new facilities, or other changes that would affect the same visual resources. Temporary cumulative visual impacts could occur if the construction schedules overlapped. However, of the projects listed in Table 5-1, the 1 Sunnyside Lane development and the Orinda Grove housing development are the closest projects to the Happy Valley Pipeline project (approximately one and two miles away, respectively). Both developments are in the planning phase and it is uncertain if these projects would overlap in schedule with the Happy Valley Pipeline project. All of the other projects listed in Table 5-1 are located over 2 miles away from the Happy Valley Pipeline project. For these reasons, it is prudent to assume that these projects would not substantially alter any scenic resources (including trees) in the vicinity of the Happy Valley Pipeline project. Thus, impacts on visual resources would not be cumulatively considerable. With implementation of Measure 3.3-2b and Measures 3.6-1a through 3.6-1d, which require site restoration and replacement of lost trees, the project's contribution to visual impacts would be less than significant.

Mitigation: None required.

5.1.3 Geology, Soils, and Seismicity

The geographic scope of potential cumulative geologic and seismic impacts encompasses the project area and immediate vicinity. Although several of the cumulative projects listed in Table 5-1 could have similar geologic impacts as the Happy Valley Pipeline project, geologic and seismic impacts are generally site specific and depend on local geologic and soil conditions. As mentioned in Section 5.1.2, above, the closest cumulative projects are the 1 Sunnyside Lane development and the Orinda Grove housing development, which are approximately one and two miles away from the project site, respectively. Since these developments would not directly overlap with the project area, potential geologic and seismic impacts would be site-specific and would not be additive with impacts of other projects listed in Table 5-1. For this reason and with implementation of Measure 3.4-1-HVPL, which requires geotechnical measures to ensure slope stability, and Measures 3.5-1a and 3.5-1b, which require control of runoff and compliance with water quality protection requirements, the project's contribution to cumulative geologic and soil impacts would be less than significant.

Mitigation: None required.

5.1.4 Hydrology and Water Quality

The geographic scope of potential cumulative hydrology and water quality impacts generally encompasses Lauterwasser Creek and storm drains in the project area. As described in Section 3.2.4, Hydrology and Water Quality, project construction and earthmoving activities could result in increased erosion and sedimentation at construction sites adjacent to or near Lauterwasser Creek. The closest cumulative projects to the Happy Valley Pipeline project, including the 1 Sunnyside Lane development and the Orinda Groves housing development, are approximately one and two miles away, respectively. Since neither of these projects would occur in the immediate vicinity of the project area or Lauterwasser Creek, no potential cumulative impacts related to hydrology and water quality are anticipated to occur. Further, the project's contribution to cumulative surface water quality impacts from construction and earthmoving activities would be less than significant with mandatory adherence to the National Pollutant Discharge Elimination System (NPDES) stormwater permitting requirements as well as implementation of WTTIP EIR Measures 3.5-1a and 3.5-1b. Potential impacts associated with the alteration of long-term drainage patterns would also be reduced to a less-than-significant level with implementation of Measure 3.5-7-HVPL, which requires a hydrological engineering analysis and design requirements to minimize erosion of the Lauterwasser Creek banks.

Mitigation: None required.

5.1.5 Biological Resources

The geographic scope of potential biological resources encompasses the jurisdictional waters and sensitive habitats (habitats for rare and endangered species and sensitive natural communities identified in federal, state, or local plans and regulations) within the project area as well as biologically linked areas in the vicinity of Lauterwasser Creek. The closest cumulative projects

(1 Sunnyside Lane development and Orinda Grove housing development) are approximately one and two miles away from the Happy Valley Pipeline project, respectively. Thus, since neither of these projects would directly overlap in area with the proposed project and because the locations of these cumulative projects are not biologically linked with the proposed project, no cumulative impacts related to biological resources are anticipated to occur. Further, compliance with applicable state and federal regulations, general plan conservation measures, and project-specific permitting would mitigate any cumulative construction effects. For the proposed project, implementation of mitigation measures that address common and special-status species and tree protection (WTTIP EIR Measures 3.6-1a through 3.6-1d, 3.6-2c through 3.6-2f, 3.6-3a through 3.6-3c, 3.6-4a, 3.6-5, 3.6-6, and 3.6-7a through 3.6-7c), would reduce impacts to affected biological resources. Therefore, with implementation of these measures, the proposed project's contribution to cumulative biological resource impacts would be less than significant.

Mitigation: None required.

5.1.6 Cultural Resources

For the purposes of this analysis, the geographic scope of potential cumulative cultural resource impacts consists of Contra Costa County. Cumulative cultural resource impacts could occur if the proposed project and other projects disturb or destroy archaeological resources, paleontological resources, or historic architectural resources. Projects identified in Table 5-1 have the potential to result in the cumulative loss of cultural resources. However, as identified in Section 3.2.6, no significant archaeological or historic architectural resources have been identified within the project area, and most excavation would occur in areas where soil has already been disturbed. Additionally, it does not appear likely that paleontological resources are located in the project vicinity. As a result, it is unlikely that the proposed project would impact cultural resources. For this reason and with implementation of Measures 3.7-1a and 3.7-2, which identify measures to be taken for the inadvertent discovery of cultural and paleontological materials, the project's contribution to cumulative cultural resources impacts would be less than significant.

Mitigation: None required.

5.1.7 Traffic and Circulation

The geographic scope of potential cumulative traffic impacts includes Miner Road and Van Ripper Lane, the haul routes that would be used by construction vehicles traveling to and from the job site (including Lombardy Lane), and the detour routes used by drivers. Potential cumulative impacts could occur as a result of roadway improvement projects that occur on roadways affected by the proposed project, or by projects that generate increased traffic at the same time on the same roads as the proposed project. Among the projects listed in Table 5-1, the only projects that have potential to overlap in time and could affect the same roads as the proposed project include the Orinda Grove residential development on Altarinda Road and the 1 Sunnyside Lane residential development.

These two projects would generate construction traffic. There is the potential for multiple construction-generated traffic for more than one project to use the same roads: that is, the total number of vehicle trips added to a common route 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 project. However, the period of time of maximum trip generation would vary among the projects, and therefore, the maximum traffic flows on the common routes would not necessarily be the sum of the maximum trips generated by overlapping projects.

The schedule of these two residential projects listed in Table 5-1 is uncertain. Consequently, it is prudent to conclude that significant cumulative traffic and circulation and traffic-related noise impacts could occur. With implementation of Measure 5-1-HVPL, the proposed project's potential impacts would not result in a considerable contribution to this potential cumulative impact.

Mitigation Measures

> **Measure 5-1-HVPL:** The District and/or its contractor(s) shall coordinate with the appropriate local government departments in Orinda and Contra Costa County and with other utility districts and agencies regarding the timing of construction projects that would occur near Miner Road and Van Ripper Lane. The coordinated plan shall include measures that address overlapping construction schedules and activities, truck arrivals and departures, land closures and detours, and the adequacy of on-street staging requirements. Specific measures to mitigate significant impacts could include employing flagmen during key construction periods, designating alternative haul routes, and providing more outreach and community noticing.

Impact Significance after Mitigation: Less than Significant.

5.1.8 Air Quality

The geographic scope of potential cumulative air quality impacts encompasses the immediate project vicinity for diesel particulates and the San Francisco Area Basin for criteria pollutants. According to the BAAQMD CEQA Guidelines, a cumulative impact occurs when two or more individual effects, considered together, are considerable or would compound or increase other environmental impacts. Cumulative impacts can result from individually minor but collectively significant impacts, meaning the proposed project's incremental effects are considerable when viewed in connection with the effects of past, current, and probable future projects, particularly if the project has not been accounted for in the local General Plan and the applicable Clean Air Plan for the area, i.e., the 2005 Ozone Strategy. Any proposed project that would individually have a significant air quality impact would also be considered to have a significant cumulative air quality impact. Cumulative impacts could occur if implementation of the proposed project and the projects listed in Table 5-1 resulted in increased construction emissions that violated air quality standards, contributed substantially to the regions nonattainment status for ozone and particulate matter, or exposed sensitive receptors to pollutants.

As described in Section 3.2.8, Air Quality, the proposed change in the pipeline alignment would result in an increase in dust and equipment exhaust emissions. Implementation of WTTIP EIR Measures 3.9-1a, 3.9-1b, and 3.9-1c, as well as 3.10-1a-HVPL would reduce construction-related air quality impacts to a less-than-significant level for all criteria pollutants. The BAAQMD states that for projects that would not lead to a significant increase of ROG, NO_X, or PM_{10} emissions, the cumulative effect is evaluated based on a determination of the consistency of the project with the regional clean air plan. Since the Happy Valley Pipeline project would not require a general plan amendment nor would conflict with the clean air plan control measures, the proposed project would not contribute considerably to any cumulative impacts on air quality.

Mitigation: None required.

5.1.9 Noise and Vibration

The geographic scope of potential cumulative noise and vibration impacts encompasses the project area and its immediate vicinity as well as areas adjacent to access and haul routes to the project site. As indicated in Table 5-1, only a few Contra Costa County Department of Public Works projects would overlap in schedule with the proposed project. However, two factors would reduce the potential for significant cumulative noise and vibration impacts to occur. First, most noise and vibration impacts would be localized to the vicinity of the respective project. Second, because the proposed project and other construction projects would occur primarily during day-time hours, noise generating construction activities would be exempt by Orinda Noise Ordinance and the noise ordinances of other jurisdictions. Overlapping noise impacts would be limited to impacts along haul routes where overlapping construction schedules could result in combined noise increases from increased truck traffic. With implementation of Measure 5-1-HVPL, the District would coordinate with other utility districts and agencies regarding the timing of construction projects. This measure could include designating alternative haul routes (if necessary) to reduce the potential for the project to significantly contribute to cumulative noise impacts on haul routes. Therefore, the project's contribution to cumulative noise impacts would not be cumulatively considerable and would be less than significant.

Mitigation: None required.

5.1.10 Greenhouse Gas Emissions

The scope of potential cumulative greenhouse gas (GHG) emissions, while theoretically global in extent, is considered in regional and statewide terms for practical purposes. The Happy Valley Pipeline project's GHG emissions would contribute to cumulative climate change effects as described in Section 3.2.10, Greenhouse Gas Emissions, under Impact 3.9-7-HVPL. As discussed in Section 3.2.10, the proposed project's construction-related GHG emissions represent approximately 0.0000034 percent of total GHG emissions estimated for the entire Bay Area, which is considered extremely small in terms of the Bay Area GHG emissions and would result in a less-than-significant impact. Implementation of WTTIP EIR Measure 3.9-1c, BAAQMD Exhaust Control Measures, would also limit criteria pollutant emissions and reduce construction-related GHG emissions. In addition, implementation of Measure 3.9-7-HVPL, which would require the District to incorporate

BAAQMD-recommended best management practices, would also minimize construction-related GHG emissions. Since the Happy Valley Pipeline project's GHG emissions would meet the state goals outlined in AB 32, the project's contribution to cumulative GHG emissions and associated climate change impacts would not be cumulatively considerable and would be less than significant.

Mitigation: None required.

5.2 Growth-Inducement Potential and Secondary Effects of Growth

Section 15126.2(d) of the State CEQA Guidelines requires an evaluation of the growth inducing impacts of a Proposed Project. Growth impacts were analyzed in the 2006 WTTIP EIR (Chapter 4). Those WTTIP projects that would increase water distribution capacity to meet 2030 demands would support some growth. Implementation of the WTTIP as a whole (including the Happy Valley Pipeline) 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. The proposed changes to the Happy Valley Pipeline would not alter its planned capacity (or, consequently, its growth-inducing potential) that was evaluated in the WTTIP EIR.

5.3 Irreversible Environmental Changes

Section 15126(c) of the State CEQA Guidelines requires an EIR to include a discussion of significant irreversible environmental changes that would result from implementation of a project. Significant irreversible environmental changes are defined as uses of non-renewable resources used during the construction and/or operation of a proposed project that would involve a large commitment of resources that would not be available for future removal or nonuse.

Construction of the proposed project would result in the commitment of non-renewable natural resources used in construction (such as metal, gravel, petroleum products, and others) and slowly-renewable resources, such as wood products used during construction. However, since consumption or use of non-renewable resources would be relatively low for the implementation of the proposed project, no significant adverse effects to non-renewable resources would occur.

TABLE 5-1
OTHER PROJECTS IN THE WTTIP AREA WITH POTENTIAL FOR CUMULATIVE IMPACTS

Planning Jurisdiction	Project Name	Project Description	Project Status / Construction Schedule	Source
OTHER EBMUD PROJECTS				
EBMUD (Lafayette)	Sunset Reservoir Rehabilitation	Demolish/remove 0.07-million-gallon tank located east of Lafayette Reservoir.	Demolition 2015	EBMUD, 2010
EBMUD (Orinda)	Happy Valley Pumping Plant Project	Construction of a new pumping plant serving the Los Aromas Pressure Zone and located on the west side of Miner Road at Camino Sobrante.	Begin Construction in 2014	EBMUD, 2010
EBMUD (Unincorporated Contra Costa)	San Pablo Dam Seismic Upgrades Project	Upgrade of San Pablo Dam to meet seismic safety requirements.	Completed in Summer 2010	EBMUD, 2010
EBMUD (Lafayette)	Highland Reservoir Project	Construct a new storage tank on District property in the Lafayette Reservoir Recreation Area. This new tank will be connected to Lafayette Water Treatment Plant across Mt. Diablo Boulevard and will be served by a new access road.	Under Construction/ Estimated Completion Fall 2011	EBMUD, 2010
EBMUD (Walnut Creek)	Walnut Creek Water Treatment Plant Improvements	Constructing two new filters and a new pumping plant, and will be upgrading the plant's waste stream reclaim system.	Under Construction/ Estimated Completion April 2012	EBMUD, 2010
ORINDA				
City of Orinda	Wilder Subdivision (southeast of Highway 24 and southwest of Moraga Way, Orinda)	245 single family residential units; 5 playfields; a community art and garden center; a private swim club; a network of trails within the development and in the open space areas surrounding the developed portions of the project; re-routing an existing 115 kV Moraga-Claremont power line; and preservation of approximately 775 acres of open space.	Approved / Under construction	City of Orinda Planning Department, 2010a
City of Orinda	24 Adobe Lane Development	16 residential lot subdivision at 24 Adobe Lane (near the border between the City of Orinda and the Town of Moraga).	Planned / construction date uncertain	City of Orinda Planning Department, 2010a
City of Orinda	Orinda Grove by Pulte Homes, Altarinda Road	Development of an 11-acre Pine Grove site and the adjacent 3.1-acre City-owned ball fields. The development proposal contains 73 homes, relocation of City-owned ball fields, and construction of an approximately 6,000-square foot Orinda Union School District (OUSD) office building to replace the existing District offices on the site.	Planned / Spring 2011	City of Orinda Planning Department, 2010a
City of Orinda	Orinda Oaks	11 residential lots over 23.82 acres on Stein Way.	Map and subdivision application approved/ construction date uncertain	City of Orinda Planning Department, 2010b
City of Orinda	1 Sunnyside Lane Development	4 residential lots over 45.7 acres.	Planned / construction date uncertain	City of Orinda Planning Department, 2010b
City of Orinda	Lavenida Lane Development	8 residential lots over 12.2 acres.	Planned / construction date uncertain	City of Orinda Planning Department, 2010b

TABLE 5-1 (Continued)
OTHER PROJECTS IN THE WTTIP AREA WITH POTENTIAL FOR CUMULATIVE IMPACTS

Planning Jurisdiction	Project Name	Project Description	Project Status / Construction Schedule	Source
ORINDA (cont.)				
City of Orinda	Southwood Valley Development	17 residential lots over 42.93 acres.	Planned / construction date uncertain	City of Orinda Planning Department, 2010b
City of Orinda	2010 Pavement Rehabilitation Project	Pavement restoration at various locations in the City of Orinda.	Planned for 2010 / construction date uncertain	City of Orinda Public Works Deparment, 2010
City of Orinda	La Espiral Slope Stabilization Project	Installation of a series of concrete pilings, asphalt paving to re-establish the roadway section, and asphalt dike to manage roadside drainage.	Expected to begin July 2010	City of Orinda Public Works Deparment, 2010
City of Orinda	2010 Moraga Way Pavement Rehabilitation and Improvements Project	Reconstruction and replacement of failing pavement on Moraga Way from Camino Encinas (south) to Bryant Way and Bryant Way east to the southbound Highway 24 on-ramp, and also install bulbouts and ADA compliance sidewalk ramps in the downtown intersections.	Construction begins August 2010	City of Orinda Public Works Deparment, 2010
City of Orinda	2010 Drainage Improvements Project	Annual drainage project which encompasses new pipe installations, pipe replacements, and miscellaneous concrete structures at various locations.	Expected to begin June 2010	City of Orinda Public Works Deparment, 2010
City of Orinda/ Contra Costa Sanitary District	Hall Drive Sewer Renovation Project	Installation of approximately 2,600 feet of 6-inch sewer lines predominantly in easements using horizontal direction drilling, pipe bursting, and open-cut methods.	Under construction ; estimated to be complete in Summer 2010	Central Contra Costa Sanitary District, 2010
Central Contra Costa Sanitary District	Orinda Crossroads Pumping Station Force Main	Evaluation and rehabilitation of existing force mains in various parts downtown Orinda towards Lafayette.	Approved / Construction TBD	Carpenter, 2010
Central Contra Costa Sanitary District	Collection System Renovation Program	Replace or renovate small-diameter sewers in south Orinda (south of Highway 24).	Planned / no certain dates	Carpenter, 2010
Central Contra Costa Sanitary District	South Orinda Phase 4	Replace or renovate at least 1,200 small-diameter sewers in southern Orinda.	Planned / 2011	Carpenter, 2010
Central Contra Costa Sanitary District	North Orinda Phase 5	Replace or renovate at least 1,200 small-diameter sewers in northern Orinda.	Planned / 2011	Carpenter, 2010
PG&E	Rule 20 Electric Undergrounding Program	Undergrounding of utilities along Miner Road.	Planning Phase/ 2010	PG&E, 2010
MAJOR HIGHWAY PROJECTS				
Caltrans (Contra Costa Transit Authority)	Caldecott Tunnel Improvement Project	Construct a fourth bore between Contra Costa and Alameda Counties.	Under construction / 2010-2014	Caltrans, 2010

NOTE: Shaded projects indicates preliminary determination of potential for overlap with construction schedule for the Happy Valley Pipeline project.

CHAPTER 6.0
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CHAPTER 7.0
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APPENDIX A

Mitigation Monitoring and Reporting Plan for the Happy Valley Pipeline Project

APPENDIX A
MITIGATION MONITORING AND REPORTING PLAN FOR THE HAPPY VALLEY PIPELINE PROJECT

Note: This mitigation monitoring and reporting plan includes all mitigation measures identified in the WTTIP EIR that are applicable to the Happy Valley Pipeline Project, along with the new or revised measures identified in this SEIR. New or revised measures included in this SEIR include the tag HVPL after their number. Some text is shown in strikethrough to correct errata in the WTTIP EIR MMRP. The errata do not affect the Happy Valley Pipeline Project.

Mitigation Measures Note: Highlighted mitigation measures are those from the WTTIP EIR that have been revised.	**Responsibility for Implementation**	**Responsibility for Monitoring**	**Impact(s) Being Mitigated**	**Check Box (Date)**	**Check Box (Date)**	**Check Box (Date)**
Land Use						
Measure 3.2-1-HVPL: The District or its contractor shall provide 14-day advance notice by mail to all facilities, tenants, and property owners within 40 feet of project construction zones. The notice will also be posted near the project site. The notice shall state the construction location, nature of activities, and schedule. The notice shall indicate alternative traffic and bicycle routes and provide suggestions for avoiding traffic delays and reducing the effects of construction-related noise as well as dust and exhaust emissions (e.g., planning alternative schedules, closing windows facing the planned construction sites). The District shall identify and provide a public liaison officer before and during construction to respond to the concerns of nearby residences, recreationists, and other potentially affected land uses. Procedures for contacting the public liaison officer via telephone, email, or in person shall be included in the notices. Prior to construction, the District public liaison officer, resident engineer, and construction manager shall develop procedures for receiving and responding to questions and complaints.	EBMUD or EBMUD's construction contractor	EBMUD	**Impact 3.2-1:** Division of an established community.			
Visual Quality						
			Impact 3.3-1 is less than significant for the HVPL project, no mitigation required.			
Measure 3.3-2b: ~~For each project (with the exception of the Fay Hill Pumping Plant and pipelines in roadways), t~~The District will ensure that its contractors restore disturbed, graded areas to a natural-appearing landform.	EBMUD and EBMUD's construction contractor	EBMUD	**Impact 3.3-2:** Alteration of the appearance of WTTIP sites.			
Implement Measures 3.6-1a-HVPL, 3.6-1b-HVPL, 3.6-1c, and 3.6-1d as described in Section 3.6, Biological Resources.	See below.	See below.				
Implement Measure 3.3-2b as described above. Implement Measures 3.6-1a -HVPL, 3.6-1b-HVPL, 3.6-1c, and 3.6-1d as described in Section 3.6, Biological Resources.	See above. See below.	See above. See below.	**Impact 3.3-3:** Effects on views from the surrounding area, including public roadways, public trails, and open space and residential areas.			
Implement Measure 3.3-2b as described above. Implement Measures 3.6-1a-HVPL, 3.6-1b-HVPL, 3.6-1c, and 3.6-1d as described in Section 3.6, Biological Resources.	See above. See below.	See above. See below.	**Impact 3.3-4:** Effects on a scenic vista.			
Geology, Soils, and Seismicity						
Measure 3.4-1-HVPL: A site specific geotechnical evaluation has been completed to identify adverse slope instability conditions in the vicinity of the Lauterwasser Creek crossing and to provide design recommendations to reduce and eliminate potential slope hazards (AMEC, 2010). Consistent with the recommendations provided in the geotechnical evaluation, the District will incorporate the following measures to ensure that slope hazards are reduced or eliminated: • Burying the pipeline deep enough to avoid areas of unstable soil • Bedding and backfilling the pipeline in concrete, slurry cement backfill, or controlled density fill to ensure the stability of the pipeline and surrounding fill. • Minimizing the amount of time trench excavations are left open before being backfilled, ensuring that the length of excavated trench does not exceed the amount of pipeline that can be installed by the end of a day • Performing work during the dry season to minimize the potential to encounter groundwater • Removing loose soil and rock along the creek banks, and installing bank stabilization and/or erosion control features within the District ROW to prevent sloughing and caving • Backfilling the excavations and filling all voids on the sidewalls/side slopes with engineered material to prevent excessive settlement and movement of the backfill • Encasing the pipe in concrete along the bottom and on portions of the steep bank of Lauterwasser Creek to protect the pipe • Developing and implementing a three-year monitoring program to assess the stability of the Lauterwasser Creek banks within the District ROWs The final design shall be reviewed and approved by a registered geotechnical engineer or engineering geologist.	EBMUD	EBMUD	**Impact 3.4-1:** Potential injury and/or damage resulting from unstable slopes.			

APPENDIX A
MITIGATION MONITORING AND REPORTING PLAN FOR THE HAPPY VALLEY PIPELINE PROJECT (Continued)

Mitigation Measures Note: Highlighted mitigation measures are those from the WTTIP EIR that have been revised.	**Responsibility for Implementation**	**Responsibility for Monitoring**	**Impact(s) Being Mitigated**	**Check Box (Date)**	**Check Box (Date)**	**Check Box (Date)**
Geology, Soils, and Seismicity (cont.)						
Implement Measure 3.4-1-HVPL, as described above.	See above.	See above.	**Impact 3.4-3:** Facility damage resulting from settlement or uplift caused by expansive or compressible soils.			
Implement Measure 3.4-1-HVPL, as described above.	See above.	See above.	**Impact 3.4-4:** Potential facility damage resulting from a major earthquake in areas susceptible to liquefaction.			
Implement Measures 3.5-1a and 3.5-1b, as described below.	See below.	See below.	**Impact 3.4-5-HVPL:** Impacts due to substantial soil erosion or the loss of topsoil.			
Hydrology and Water Quality						
Measure 3.5-1a: EBMUD will incorporate into contract specifications the requirement for the grading of construction staging areas to contain surface runoff so that contaminants such as oil, grease, and fuel products do not drain towards receiving waters. If heavy-duty construction equipment is stored overnight at the construction staging areas, drip pans will be placed beneath the machinery engine block and hydraulic systems to prevent any leakage from entering runoff or receiving waters.	EBMUD's construction contractor	EBMUD	**Impact 3.5-1:** Potential degradation of water quality from construction in or adjacent to creeks.			
Measure 3.5-1b-HVPL: EBMUD and its contractor(s) will comply with CDFG and the U.S. Army Corps of Engineers requirements pertaining to wetlands or streambeds, including associated water quality protection requirements of the RWQCB.	EBMUD and EBMUD's construction contractor	EBMUD				
			Impact 3.5-2 is less than significant for the HVPL Project, no mitigation required.			
Measure 3.5-3: EBMUD will require in their construction contract specifications that the contractor(s) include a measure in their erosion control plan or SWPPP prepared for the project prohibiting the stockpiling of soil, storage of hazardous materials, and stockpiling of construction materials in flood zones during the rainy season, typically between October 1 and May 1.	EBMUD's construction contractor	EBMUD	**Impact 3.5-3:** Construction in 100-year flood zones.			
			Impact 3.5-4 is less than significant for the HVPL Project, no mitigation required.			
			Impact 3.5-5 does not apply to the HVPL Project, no mitigation required.			
			Impact 3.5-6 is less than significant for the HVPL Project, no mitigation required.			
Measure 3.5-7-HVPL: Prior to construction, a licensed engineer or hydrologist will evaluate the effect of the Project on drainage patterns, sediment transport, and erosion in Lauterwasser Creek. The analysis shall consider feasible designs in the restoration of the creek bed and banks within the District's ROWs after pipeline construction to avoid adverse alteration of creek flows and minimize erosion of the bed and banks of Lauterwasser Creek. Consistent with the recommendations of the licensed engineer, the District will incorporate measures that ensure the following: • Restoration of the creek bed will be completed in a manner as to avoid adverse changes in the direction of creek flows that could increase erosion of the creek banks. • Restoration of the creek banks with erosion control measures will be completed in a manner as to avoid erosion of the restored bank and to avoid adverse changes in the direction of creek flows that could increase erosion of the creek banks upstream or downstream of the restored area. If required, the District will obtain approval of proposed designs by the appropriate regulatory agencies, including the US Army Corps of Engineers, CDFG, and RWQCB, and incorporate the licensed engineer's design recommendations into the proposed project.	EBMUD	EBMUD	**Impact 3.5-7-HVPL:** Alteration of long-term drainage patterns that would result in substantial erosion or flooding.			
			Impact 3.5-8-HVPL is less than significant for the HVPL project, no mitigation required.			

APPENDIX A
MITIGATION MONITORING AND REPORTING PLAN FOR THE HAPPY VALLEY PIPELINE PROJECT (Continued)

Mitigation Measures Note: Highlighted mitigation measures are those from the WTTIP EIR that have been revised.	**Responsibility for Implementation**	**Responsibility for Monitoring**	**Impact(s) Being Mitigated**	**Check Box (Date)**	**Check Box (Date)**	**Check Box (Date)**
Biological Resources						
Measure 3.6-1a-HVPL: EBMUD will prepare a map of the District's ROWs indicating the trees to be removed and retained (preserved). Prior to the start of any clearing, stockpiling, excavation, grading, compaction, paving, change in ground elevation, or construction, retained trees that are adjacent to or within project construction areas will be identified and clearly marked. Construction fencing will be installed at the edge of the District's ROWs and/or adjacent delineated construction areas as appropriate to reduce soil compaction and injury to adjacent preserved trees. Excavation adjacent to any trees will be performed in a manner that minimizes root damage (e.g. providing clean cuts of tree roots). See also Measure 3.6-1b-HVPL and 3.6-1c below.	EBMUD's certified arborist and construction contractor	EBMUD's biologist	**Impact 3.6-1:** Loss of or damage to protected trees.			
Measure 3.6-1b-HVPL: All pruning and root cutting of preserved trees will be performed by a certified arborist. No more than 25 percent of a tree's canopy will be removed. Tree replacement will adhere to the following guidelines: • If any protected tree native to the local area, such as valley oak and coast live oak, is removed, the District will replace it on a 3:1 basis with native trees of the same species as those removed. • All non-native protected trees which are removed will be replaced at a 1:1 ratio with a non-invasive tree species. • Non-native trees removed from a natural environment will be replaced with a native species that occurs in the area. • Replacement trees will be planted at ecologically appropriate sites or on EBMUD watershed lands. • In lieu of tree replacement, the District will fund riparian or upland restoration work by a local creek group such as Friends of Orinda Creeks or San Pablo Watershed Neighbors Education and Restoration Society for the purposes of compensating for tree loss associated with the project. In-lieu restoration work would be appropriate where restoration activities would provide greater benefit to protected trees than tree replacement. For example, restoration may be preferable where there are opportunities to preserve existing mature trees that are threatened by disease or removal, or if sufficient suitable land (in terms of exposure, soil type, etc.) for tree replacement is not identified within the San Pablo Creek watershed. Examples of appropriate restoration work include invasive plant removal and replanting of native tree species to improve the habitat value of the San Pablo Creek watershed, and improving tree health through pruning or fertilizing or other actions to reduce exposure or risk of sudden oak death. The funded restoration work must provide habitat benefits commensurable with that lost through the removal of trees.	EBMUD and EBMUD's certified arborist	EBMUD				
Measure 3.6-1c: For each project site (except for the Walnut Creek WTP ~~and the Lafayette WTP under Alternative 2~~), the contractor will be required to warrant tree health for one year after project completion and the District will guarantee the health of all trees to be preserved within and adjacent to the construction corridor of project-related pipeline and facility sites for two additional years, for a total of three years. The guarantee period for a tree will be five years if the District constructs or installs improvements or performs approved mechanical excavation within the dripline of any tree. The District will replace any tree that is to be retained but that dies as a result of project construction activities during the guarantee period with a tree of the same species. The replaced trees would be subject to the same monitoring protocols as those protected trees removed due to construction.	EBMUD	EBMUD				
Measure 3.6-1d: For each project site (except for the Walnut Creek WTP ~~and the Lafayette WTP under Alternative 2~~), the District will develop and implement a five-year tree monitoring program. Performance standards may include, but are not limited to: a 75 percent survival rate of tree plantings and the ability to be self-sustaining at the end of five years.	EBMUD's biologist	EBMUD's biologist				
Measure 3.6-2c-HVPL: If impacts to potentially jurisdictional features and associated riparian vegetation cannot be avoided or minimized, then the District will obtain a qualified biologist to complete a wetland delineation in accordance with Corps guidelines and will obtain the appropriate permits/agreements, including a Section 404 wetland permit from the Corps, a Section 401, water quality certification from the RWQCB, and/or a Section 1602 Streambed Alteration Agreement from the CDFG. The District will implement all conditions contained in these permits. The District will recontour and revegetate temporarily disturbed portions of the creek. The District will develop and implement a five-year monitoring program. Appropriate performance standards may include, but are not limited to: a 75 percent survival rate for restoration plantings; absence of non-native, invasive plant species; and a functioning, self-sustaining creek or wetland system at the end of five years. Interim measures to protect the unvegetated creek from erosion may be required. Interim measures may include installing biodegradable erosion control mats, where appropriate.	EBMUD and EBMUD's biologist	EBMUD's biologist				
Measure 3.6-2f-HVPL: The District will implement the following measures: • Ensure that work activities at creeks are completed during the low-flow period (between April 1 and October 15), unless otherwise approved by appropriate regulatory agencies (e.g., RWQCB, Corps, CDFG). • Store equipment and materials away from waterways to the extent feasible as determined by the District. No debris will be deposited within 60 feet of creeks for most WTTIP projects.	EBMUD and EBMUD's construction contractor	EBMUD's botanist				

APPENDIX A
MITIGATION MONITORING AND REPORTING PLAN FOR THE HAPPY VALLEY PIPELINE PROJECT (Continued)

Mitigation Measures Note: Highlighted mitigation measures are those from the WTTIP EIR that have been revised.	**Responsibility for Implementation**	**Responsibility for Monitoring**	**Impact(s) Being Mitigated**	**Check Box (Date)**	**Check Box (Date)**	**Check Box (Date)**
Biological Resources (cont.)						
• 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 creeks. Maintenance and fueling will be conducted away from the creek. • To control erosion on the banks of the creek, install silt fencing material along the edges of the District's ROWs and/or adjacent delineated construction areas. • Minimize the removal of riparian and wetland vegetation.						
Measure 3.6-3a: The District will require that a presence/absence survey for special-status plant species be conducted within the limits of construction by a qualified botanist during the year prior to construction. Surveys will be conducted using CDFG or USFWS survey guidelines. All surveys will be conducted during the period when the species are identifiable and will be repeated seasonally, as needed, to provide a complete species list. The results of the surveys will be filed as part of the project administrative record; if the presence of any of these species is confirmed, a copy of the survey results will be forwarded to the CDFG and/or USFWS. In the event that special-status species are proven absent, then no additional mitigation is necessary. In addition, the sensitive plant communities that are located within the project site footprints will be mapped and quantified prior to construction to aid in later avoidance, revegetation, and replacement efforts.	EBMUD's botanist	EBMUD	**Impact 3.6-3:** Loss or damage to special-status plants and sensitive natural communities.			
Measure 3.6-3b-HVPL: In the event that nonlisted special-status plant species or sensitive plant communities are present or assumed present within or immediately adjacent to the limits of construction, the District will avoid these species or sensitive plant communities and establish a visible buffer zone prior to construction, in coordination with a qualified biologist, or will redesign or relocate the proposed structure and/or staging area. If the District determines that it is not feasible to avoid disturbance or mortality, then special-status plant habitat and/or sensitive plant communities will be restored at a 1:1 ratio. If feasible, special-status plants will be salvaged. A five-year restoration mitigation and monitoring program will be developed and implemented. Appropriate performance standards may include, but are not limited to: a 75 percent survival rate of restoration plantings or plant cover; absence of invasive plant species; and a functioning, self-sustainable plant community at the end of five years.	EBMUD's botanist and EBMUD's construction contractor	EBMUD's botanist				
Measure 3.6-3c: At all WTTIP project sites, the District will revegetate all natural areas temporarily disturbed due to project activities. Areas supporting sensitive plant communities will be restored using locally collected plant materials specific to that community. For all sites, revegetation criteria will include general restoration concepts and methods, including use of locally native plant material, protection and restoration of soil conditions, irrigation, and control of aggressive non-native species. The planting effort will commence in the fall following construction at the project site. Sites disturbed prior to the planting effort will be treated immediately with a (1) seed mixture and mulch using broadcast methods, or (2) hydroseed. The plant palette will include native plants found locally, such as coffeeberry, sticky monkeyflower, miniature lupine, California poppy, purple needlegrass, California brome, and blue wild rye. All revegetated sites will be monitored for five years. Success criteria to be met at the end of five years may include: at least 80 percent survival of plantings, 75 percent vegetative cover by desirable species, and a viable, self-sustaining plant community.	EBMUD's botanist and EBMUD	EBMUD's botanist				
Measure 3.6-4a-HVPL: EBMUD will avoid disturbing active nests of raptors and other special-status nesting birds by performing preconstruction surveys and creating no-disturbance buffers. If construction activities (i.e., ground clearing and grading, including removal of trees or shrubs) are scheduled to occur during the nonbreeding season (September 1 through January 31), no mitigation is required. If construction activities are scheduled to occur during the breeding season (February 1 through August 31), EBMUD will implement the following measures to avoid potential adverse effects on nesting raptors and other special-status birds: • EBMUD will 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, EBMUD will 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. The size of these buffer zones and types of construction activities restricted in these areas will be established during construction in consultation with the CDFG and will be based on existing noise and human disturbance levels at each WTTIP project site. Nests initiated during construction are presumed to be unaffected, and no buffer would be necessary. However, the "take" of any individuals will be prohibited. • If preconstruction surveys indicate that nests are inactive or potential habitat is unoccupied during the construction period, no further mitigation is required. Trees and shrubs within the construction footprint that have been determined to be unoccupied by special-status birds or that are located outside the no-disturbance buffer for active nests may be removed.	EBMUD's construction contractor and EBMUD's biologist	EBMUD's biologist	**Impact 3.6-4:** Disturbance to nesting raptors, other special-status nesting birds, or bald eagle.			

APPENDIX A
MITIGATION MONITORING AND REPORTING PLAN FOR THE HAPPY VALLEY PIPELINE PROJECT (Continued)

Mitigation Measures Note: Highlighted mitigation measures are those from the WTTIP EIR that have been revised.	**Responsibility for Implementation**	**Responsibility for Monitoring**	**Impact(s) Being Mitigated**	**Check Box (Date)**	**Check Box (Date)**	**Check Box (Date)**
Biological Resources (cont.)						
Measure 3.6-5: EBMUD will avoid disturbance of the roosts of special-status bats by performing preconstruction surveys and creating no-disturbance buffers. 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, EBMUD will retain a qualified bat biologist to survey for special-status bats. If no evidence of bats (i.e., direct observation, guano, staining, strong odors) is present, no further mitigation is required. If evidence of bats is observed, EBMUD will carry out the following measures to avoid potential adverse effects special-status bats: • EBMUD will create a no-disturbance buffer (acceptable in size to the CDFG) around active bat roosts during the breeding season (April 15 through August 15). Bat roosts initiated during construction are presumed to be unaffected, and no buffer would be necessary. However, the take of individuals will be prohibited. • Removal of trees showing evidence of bat activity will occur during the period least likely to affect bats, as determined by a qualified bat biologist (generally between February 15 and October 15 for winter hibernacula, and between August 15 and April 15 for maternity roosts). If exclusion is necessary to prevent indirect impacts to bats due to construction noise and human activity adjacent to trees showing evidence of bat activity, these activities will also be conducted during these periods.	EBMUD's biologist and EBMUD's construction contractor	EBMUD biologist	**Impact 3.6-5:** Disturbance to special-status bat species.			
Measure 3.6-6-HVPL: EBMUD will avoid disturbance to San Francisco dusky-footed woodrat by performing preconstruction surveys. Not more than two weeks prior to construction, a qualified wildlife biologist will conduct a preconstruction survey to identify woodrat nests within 10 feet of proposed ground disturbance. A qualified wildlife biologist will conduct additional surveys periodically throughout the duration of construction activities to identify newly constructed woodrat nests. If woodrat nests can be avoided by project activities, the qualified biologist would demarcate suitable buffer areas for avoidance. If woodrat nests are located within areas proposed for construction, nest relocation would be implemented. For active woodrat nests found within 10 feet of proposed disturbance areas that cannot be avoided, understory vegetation would first be cleared from around the nest. Next, the wildlife biologist would disturb the nest and allow all woodrats to leave the nest. The site will be re-examined 72 hours later to establish that the woodrats have abandoned the site.	EBMUD's biologist and EBMUD's construction contractor	EBMUD biologist	**Impact 3.6-6:** Disturbance to San Francisco dusky-footed woodrat.			
Measure 3.6-7a-HVLP: EBMUD will avoid disturbing aquatic species, and associated habitats. Implementation of Measures 3.5-1a and b, 3.5-3, and 3.5-6 (see Section 3.5, Hydrology and Water Quality), as well as best management practices (BMPs) for construction activities, would reduce potential impacts to aquatic species and habitat resulting from sedimentation, turbidity, and hazardous materials. Specific measures aimed at protecting aquatic species include: • Construction activities within and adjacent to aquatic and riparian habitats will be monitored by a qualified biologist. The biologist will survey the work area for sensitive resources prior to the start of construction each day and monitor identified biological resources during construction activities, such as initial clearing and grading, installation of silt fencing, pipeline trench excavation, and backfilling and compaction. • Water from around the section of the worksite that is within the actively flowing channel of Lauterwasser Creek will be diverted past the construction site. This diversion will reduce the potential for sediment or other pollutants to enter the waterways and affect downstream resources. The diversion will be installed so as to capture water from the existing outlet structure and release the diverted water downstream of the construction site. • Sediment curtains will be placed downstream of the construction or maintenance zone to prevent sediment disturbed during trenching activities from being transported and deposited outside of the construction zone. • If groundwater is encountered, or if water remains within the worksite after flows are diverted, it will be pumped out of the construction area and into a retention basin constructed of hay bales lined with filter fabric. The pump(s) will be screened to avoid entrapment of aquatic species. • Silt fencing will be installed in all areas where construction occurs within 100 feet of actively flowing water. • A spill prevention plan for potentially hazardous materials will be prepared and implemented. The plan will include the proper handling and storage of all potentially hazardous materials, as well as the proper procedures for cleaning up and reporting any spills. If necessary, containment berms will be constructed to prevent spilled materials from reaching the creek channels.	EBMUD's biologist and EBMUD's construction contractor	EBMUD biologist	**Impact 3.6-7:** Degradation of special-status aquatic species habitat.			

APPENDIX A
MITIGATION MONITORING AND REPORTING PLAN FOR THE HAPPY VALLEY PIPELINE PROJECT (Continued)

Mitigation Measures Note: Highlighted mitigation measures are those from the WTTIP EIR that have been revised.	**Responsibility for Implementation**	**Responsibility for Monitoring**	**Impact(s) Being Mitigated**	**Check Box (Date)**	**Check Box (Date)**	**Check Box (Date)**
Biological Resources (cont.)						
• Equipment and materials will be stored at least 50 feet from waterways. No debris (such as trash and spoils) will be deposited within 100 feet of wetlands. Staging and storage areas for equipment, materials, fuels, lubricants, and solvents will be located outside of the stream channel and banks and be limited to the smallest size feasible as determined by EBMUD. Stationary equipment such as motors, pumps, generators, compressors, and welders located within or adjacent to the stream will be positioned over drip pans. Any equipment or vehicles driven and/or operated within or adjacent to the stream will be checked and maintained daily to prevent leaks of materials that, if introduced to water, could be deleterious to aquatic life. Vehicles will be moved away from the stream prior to refueling and lubrication. • Proper and timely maintenance of vehicles and equipment will be performed to reduce the potential for mechanical breakdowns that could lead to a spill of materials into or around creeks. Maintenance and fueling will be conducted at least 75 feet from riparian or aquatic habitat.						
Measure 3.6-7b-HVPL: EBMUD will avoid disturbing California red-legged frog and its habitat. To prevent impacts to California red-legged frog during and after construction adjacent to Lauterwasser Creek in the District's ROWs, reasonable and prudent measures for protection of California red-legged frog from the USFWS Biological Opinion for this species (USFWS, 1999), as well as any additional protection measures developed through informal consultation with the USFWS, will be implemented. These measures include environmental training, construction equipment and materials storage guidelines, silt fencing, and revegetation, as described in Measure 3.6-7a, as well as the following measures: • The name and credentials of a biologist qualified to act as a project biologist/construction monitor will be submitted to USFWS for approval at least 15 days prior to the commencement of work. • A USFWS-approved biologist will survey the worksite two weeks before the onset of construction activities. If California red-legged frogs, tadpoles, or eggs are found, the approved biologist will contact the USFWS to determine if moving any of these life-stages is appropriate. If the USFWS approves moving the animals, the biologist will be allowed sufficient time to move frogs from the worksite before work activities begin. If California red-legged frogs are not identified, construction may proceed at these sites. • Exclusion fencing will be installed at the edge of the District's ROWs and/or adjacent delineated construction areas, as directed by the USFWS, to prevent California red-legged frogs in adjacent areas from moving into project work areas. • In the event that a California red-legged frog is encountered in a construction area and does not leave of its own accord, work shall be stopped in the immediate area. The USFWS will be contacted for approval before the animal is relocated. • A USFWS-approved biologist will be present at the active worksites until such time that the removal of California red-legged frogs, instruction of workers, and natural habitat disturbance have been completed. After this time, the contractor or permittee will designate a person to monitor onsite compliance with minimization measures. The biologist will ensure that this individual receives training outlined in the programmatic Biological Opinion. (see also Measure 3.6-9-HVPL) • During work activities, trash that may attract predators will be properly contained, removed from the worksite, and disposed of regularly. Following construction, trash and construction debris will be removed from work areas. • Work activities within or adjacent to potential California red-legged frog aquatic habitat will be completed between April 1 and November 1. • The USFWS-approved biologist will remove exotic species, such as crayfish and centarchid fish, from the project area. Should the USFWS determine through informal consultation that formal consultation is necessary, EBMUD will prepare a biological assessment and initiate formal consultation with the USFWS under Section 7 of FESA. Any additional California red-legged frog protection measures and additional habitat compensation required for program-level project impacts included in the USFWS Biological Opinion will be implemented during and after construction, as applicable.	EBMUD's biologist and EBMUD's construction contractor	EBMUD biologist				
Measure 3.6-7c: EBMUD will avoid disturbing western pond turtle, foothill yellow-legged frog, and their habitats. No more than two weeks prior to the commencement of ground-disturbing activities, a qualified biologist retained by EBMUD will perform surveys for foothill yellow-legged frog and western pond turtle within suitable habitat on the WTTIP project sites. Surveys will include western pond turtle nests as well as individuals. The biologist (with the appropriate agency permits) will temporarily relocate any identified western pond turtles or foothill yellow frogs upstream of the construction site, and temporary barriers will be placed around the construction site to prevent ingress. Construction will not proceed until the work area is determined to be free of foothill yellow-legged frogs, as well as western pond turtles and their nests. The biologist will be responsible for relocating adult turtles and frogs that move into	EBMUD's biologist and EBMUD's construction contractor	EBMUD biologist				

APPENDIX A
MITIGATION MONITORING AND REPORTING PLAN FOR THE HAPPY VALLEY PIPELINE PROJECT (Continued)

Mitigation Measures Note: Highlighted mitigation measures are those from the WTTIP EIR that have been revised.	**Responsibility for Implementation**	**Responsibility for Monitoring**	**Impact(s) Being Mitigated**	**Check Box (Date)**	**Check Box (Date)**	**Check Box (Date)**
Biological Resources (cont.)						
the construction zone after construction has begun. If a nest is located within a work area, the biologist (with the appropriate permits from the CDFG) may move the eggs to a suitable facility for incubation, and release hatchlings into the creek system in late fall. The biologist will be present on the WTTIP project sites during initial ground clearing and grading, culvert replacement and/or installation over drainages, and during all other construction activities within or adjacent to drainages with the potential to support foothill yellow-legged frog or western pond turtle.						
			Impact 3.6-8 is less than significant for all projects, no mitigation required			
Measure 3.6-9-HVPL: To avoid and minimize take of the Alameda whipsnake, the District will implement the following measures within the District's ROWs within the riparian habitat of Lauterwasser Creek and adjacent upland habitat: (1) Trenches with a depth of one foot or greater that are left open overnight will be equipped with ramps every 150 feet, to allow any animals that get in the trench to escape. The ramps will be constructed of dirt fill, wood planking, or other suitable materials placed at an angle of no greater than 30 degrees. (2) No plastic monofilament will be used for erosion control or other purposes, as Alameda whipsnakes and other wildlife may become entangled in it. Jute netting or other suitable replacement will be used instead. (3) The U.S. Fish and Wildlife Service approved biologist (see Measure 3.6-7b) will conduct a worker education session for all workers, to include the natural history of Alameda whipsnake and California red-legged frog, measures required to avoid harm to the species, and penalties associated with enforcement of the California Endangered Species Act and federal Endangered Species Act. (4) In the event that an Alameda whipsnake is encountered in a construction area and does not leave of its own accord, work shall be stopped in the immediate area. The USFWS will be contacted for approval before the animal is relocated.	EBMUD's biologist and EBMUD's construction contractor	EBMUD biologist	**Impact 3.6-9-HVPL:** Adverse effects to Alameda whipsnake.			
Cultural Resources						
Measure 3.7-1a: EBMUD will include the following in WTTIP contract specifications for ground-disturbing activities, including excavation and grading. 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.), work will be suspended and EBMUD staff will be contacted. A qualified cultural resource specialist will be retained and will perform any necessary investigations to determine the significance of the find. EBMUD will then implement any mitigation deemed necessary for the recordation and/or protection of the cultural resources. In addition, pursuant to Sections 5097.97 and 5097.98 of the California Public Resources Code and Section 7050.5 of the California Health and Safety Code, in the event of the discovery of human remains, all work will be halted and the county coroner will be immediately notified. If the remains are determined to be Native American, guidelines of the Native American Heritage Commission will be adhered to in the treatment and disposition of the remains.	EBMUD's archaeologist and EBMUD's biologist	EBMUD's archaeologist / EBMUD's biologist	**Impact 3.7-1:** Potential disturbance to archaeological resources, including unrecorded cultural resources.			
Measure 3.7-2: EBMUD or an appointed representative will notify a qualified paleontologist of any discoveries, document the discovery as needed, evaluate the potential resource, and assess the significance of the find under the criteria set forth in Section 15064.5 of the CEQA Guidelines. In the event a fossil is discovered during construction, excavations within 50 feet of the find will be temporarily halted or diverted until the discovery is examined by a qualified paleontologist, in accordance with Society of Vertebrate Paleontology standards (SVP, 1995). The paleontologist will notify EBMUD to determine procedures to be followed before construction is allowed to resume at the location of the find. If EBMUD determines that avoidance is not feasible, the paleontologist will prepare an excavation plan for mitigating the effect of the project on the qualities that make the resource important, and the plan will be implemented. The plan will be submitted to EBMUD for review and approval.	EBMUD and EBMUD's paleontologist	EBMUD and EBMUD's paleontologist	**Impact 3.7-2:** Potential disturbance to paleontological resources.			
Traffic and Circulation						
Measure 3.8-1-HVPL: The following requirements will be incorporated into contract specifications for the project: The District or contractor(s) will obtain any necessary road encroachment permits prior to construction and will comply with conditions of approval attached to project implementation. As part of the road encroachment permit process, the District or contractor(s) will submit a traffic safety / traffic management plan (for work in the public right-of-way) to the City of Orinda. Elements of the plan will likely include, but are not necessarily limited to, the following: – 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.	EBMUD and EBMUD's Construction Contractor	EBMUD	**Impact 3.8-1:** Short-term increases in vehicle trips by construction workers and construction vehicles.			

APPENDIX A
MITIGATION MONITORING AND REPORTING PLAN FOR THE HAPPY VALLEY PIPELINE PROJECT (Continued)

Mitigation Measures Note: Highlighted mitigation measures are those from the WTTIP EIR that have been revised.	**Responsibility for Implementation**	**Responsibility for Monitoring**	**Impact(s) Being Mitigated**	**Check Box (Date)**	**Check Box (Date)**	**Check Box (Date)**
Traffic and Circulation (cont.)						
– 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. – 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). – Coordinate with the County Connection so the transit provider can temporarily relocate or reconfigure 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.						
Measure 3.8-2-HVPL: Implement Measure 3.8-1-HVPL, which stipulates actions required of contractor(s) to reduce traffic flow impacts to a less-than-significant level.	See above	See above	**Impact 3.8-2:** Reduction in the number of, or the available width of, travel lanes on roads where pipeline construction would occur, resulting in short-term traffic delays for vehicles traveling past the construction zones.			
Measure 3.8-3-HVPL: Implement Measure 3.8-1-HVPL, which stipulates actions required of contractor(s) to reduce parking impacts to a less-than-significant level.	See above	See above	**Impact 3.8-3:** Demand for parking spaces to accommodate construction worker vehicles; temporary displacement of on-street parking along pipeline alignment routes.			
Measure 3.8-4-HVPL: Implement Measure 3.8-1-HVPL, which stipulates actions required of contractor(s) to reduce potential traffic safety impacts to a less-than-significant level.	See above	See above	**Impact 3.8-4:** Potential traffic safety hazards for vehicles, bicyclists, and pedestrians on public roadways.			
Measure 3.8-5-HVPL: Implement Measure 3.8-1-HVPL, which stipulates actions required of contractor(s) to reduce access impacts to a less-than-significant level.	See above	See above	**Impact 3.8-5:** Access disruption to adjacent land uses and streets for both general traffic and emergency vehicles, as well as disruption to bicycle/pedestrian access and circulation.			
Measure 3.8-7: Prior to project construction, road conditions will be documented for all routes that will be used by project-related vehicles. Road conditions will also be documented after project construction is completed. Roads damaged by construction will be repaired to a structural condition equal to that which existed prior to construction activity.	EBMUD's Construction Contractor	EBMUD	**Impact 3.8-7:** Increased wear-and-tear on the designated haul routes used by construction vehicles.			
Air Quality						
Measure 3.9-1a-HVPL: The District will incorporate into the contract specifications the following requirements: *BAAQMD Basic Control Measures* • 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. • Load trucks in a manner that will 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.	EBMUD's construction contractor	EBMUD	**Impact 3.9-1:** Short-term increases in fugitive dust (including inhalable particulates) and equipment exhaust emissions during construction activities.			

APPENDIX A
MITIGATION MONITORING AND REPORTING PLAN FOR THE HAPPY VALLEY PIPELINE PROJECT (Continued)

Mitigation Measures Note: Highlighted mitigation measures are those from the WTTIP EIR that have been revised.	**Responsibility for Implementation**	**Responsibility for Monitoring**	**Impact(s) Being Mitigated**	**Check Box (Date)**	**Check Box (Date)**	**Check Box (Date)**
Air Quality (cont.)						
• 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 periodically up to daily with regenerative air or water sweepers with dust/particulate storage hoppers on all paved access roads, parking areas, and staging areas at construction sites and if visible soil material is carried onto adjacent streets.						
Measure 3.9-1b: The District will incorporate into the contract specifications the following requirements: *BAAQMD Enhanced Control Measures* • 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.)	EBMUD's construction contractor	EBMUD				
• 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.						
Measure 3.9-1c: To limit exhaust emissions, the District will incorporate into the contract specifications the following requirements: BAAQMD Exhaust Controls • 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.~~ • As specified in EBMUD Policy 7.05, limit the idling of all mobile and stationary construction equipment to five minutes; as specified in Sections 2480 and 2485, Title 13, California Code of Regulations, 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. • For operation of any stationary, diesel-fueled, compression-ignition engines as part of construction of WTTIP facilities, comply with Section 93115, Title 17, California Code of Regulations, Airborne Toxic Control Measure for Stationary Compression Ignition Engines, which specifies fuel and fuel additive requirements as well as 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. • Require low-emissions tuneups and perform such tuneups regularly for all equipment, particularly for haul and delivery trucks. Submit a log of required tuneups to EBMUD on a quarterly basis for review.	EBMUD's construction contractor	EBMUD				
			Impact 3.9-2 is less than significant for the HVPL project, no mitigation required. Impact 3.9-3 does not apply to the HVPL project, no mitigation required.			
			Impact 3.9-4 does not apply to the HVPL project, no mitigation required.			
			Impact 3.9-5 is less than significant for the HVLP project, no mitigation required.			
			Impact 3.9-6 is less than significant for the HVPL project, no mitigation required.			
Measure 3.9-7-HVPL: The District will incorporate into the contract specifications the following BAAQMD-recommended Best Management Practices (BMPs) for GHG emissions for implementation, where feasible: • At least 15 percent of the fleet should be alternative-fueled (e.g., biodiesel, electric) construction vehicles/equipment. • At least 10 percent of building materials should be from local sources. • At least 50 percent of construction waste or demolition materials should be recycled or reused.	EBMUD's construction contractor	EBMUD	**Impact 3.9-7-HVPL:** GHG construction emissions and conflicts with any applicable plans, policies, or regulations adopted for the purpose of reducing GHG emissions.			

APPENDIX A
MITIGATION MONITORING AND REPORTING PLAN FOR THE HAPPY VALLEY PIPELINE PROJECT (Continued)

Mitigation Measures Note: Highlighted mitigation measures are those from the WTTIP EIR that have been revised.	**Responsibility for Implementation**	**Responsibility for Monitoring**	**Impact(s) Being Mitigated**	**Check Box (Date)**	**Check Box (Date)**	**Check Box (Date)**
Noise and Vibration						
Measure 3.10-1a-HVPL: The District will incorporate into contract specifications a requirement that construction activities at the construction site will not cause daytime noise levels to exceed the 70-dBA speech interference criterion at the closest affected sensitive receptors for more than two weeks (except for work within the District's ROWs, which will occur for approximately one month), as well as that noise levels are consistent with local ordinances (see Table 3.2.9-1). Measures that would be implemented to reduce noise levels (as demonstrated in Table 3.2.9-2) to meet this criterion include the following: • Truck operations (haul trucks and concrete delivery trucks) will be limited to the daytime hours to the extent feasible, as described in Measure 3.10-1b-HVPL. • Best available noise control techniques (including mufflers, intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds) will be used for all equipment and trucks as necessary. • If impact equipment (e.g., jack hammers, pavement breakers, and rock drills) is used during project construction, an exhaust muffler on the compressed-air exhaust will be used (a muffler can lower noise levels from the exhaust by up to about 10 dB). External jackets on the tools themselves will be used, where feasible, which could achieve a reduction of 5 dB. Quieter procedures, such as drilling rather than impact equipment, will be used whenever feasible. • Stationary noise sources will be located as far from sensitive receptors as possible. If they must be located near receptors, adequate muffling (with enclosures) will be used to ensure local noise ordinance limits are met. Enclosure opening or venting will face away from sensitive receptors. Enclosures will be designed by a registered engineer regularly involved in noise control analysis and design. Operation of any stationary equipment beyond the time limits specified will meet applicable noise ordinance noise limits (see Measure 3.10-1b-HVPL). • Material stockpiles as well as maintenance/equipment staging and parking areas will be located as far as practicable from residential and school receptors. An EBMUD contact person will be designated for responding to construction-related issues, including noise. The name and phone number of the liaison will be conspicuously posted at construction areas, on all advanced notifications, and on the EBMUD project website. This person will take steps to resolve complaints, including periodic noise monitoring, if necessary.	EBMUD and EBMUD's construction contractor	EBMUD	**Impact 3.10-1:** Intermittent and temporary noise above existing ambient levels during construction.			
Measure 3.10-1b-HVPL: Construction will be restricted to the hours of operation specified the Orinda Noise Ordinance (as listed in Table 3.10-1, including restrictions provided in footnotes and any other ordinance exceptions and provisions in effect at the time of this SEIR publication), except for pipeline construction in roadways (which is proposed to occur from 9:00 a.m. to 9:00 p.m., Monday through Friday), during critical water service outages or other emergencies and special situations (including pipeline construction in Miner Road and Van Ripper Lane, which is proposed to occur from 9:00 a.m. to 9:00 p.m., Monday through Friday). Any equipment operating beyond these hours will be subject to the day and night noise limits for various activities in single-family residential zones.	EBMUD and EBMUD's construction contractor.	EBMUD				
			Impact 3.10-2 is less than significant for the HVPL project, no mitigation required.			
Measure 3.10-3a-HVPL: To prevent cosmetic or structural damage to structures adjacent to the District's ROW, EBMUD will incorporate into contract specifications restrictions on equipment operation, whereby surface vibration will be limited to no more than 0.5 in/sec PPV, measured at the nearest residential structures. EBMUD will also monitor for excessive vibration when pipe bursting activities occur immediately adjacent to the 557 Miner Road residence. If vibration levels are found to exceed the 0.5 in/sec PPV threshold, construction will be halted immediately and alternative construction methods will be implemented to maintain vibration levels below this threshold.	EBMUD's construction contractor	EBMUD	**Impact 3.10-3:** Construction of WTTIP facilities could cause vibration that could disturb local residents and cause cosmetic damage to buildings and structures.			
Measure 3.10-3b-HVPL: When pipe bursting is used within the District ROW and a structure is within 10 feet of the pipe bursting operation EBMUD construction specifications will require the contractor to excavate around the pipe to reduce contact with the surrounding ground and avoid impacts related to soil movement and vibration.	EBMUD's construction contractor	EBMUD				
Measure 3.10-3c-HVPL: With permission of homeowners, EBMUD will conduct a preconstruction survey of homes, other sensitive structures, hardscaping, hillsides, and slide areas adjacent to the District's ROW, for potential effects due to vibration-generating activities. EBMUD will respond to any claims by inspecting the affected property promptly, but in no case more than five working days after the claim was filed. Any new cracks or other changes in structures will be compared to preconstruction conditions and a determination made as to whether the proposed project could have caused such damage. In the event that the project is demonstrated to have caused the damage, the District will have the damage repaired to the pre-existing condition.	EBMUD and EBMUD's construction contractor.	EBMUD				
			Impact 3.10-4 is less than significant for the HVPL project, no mitigation is required.			

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MITIGATION MONITORING AND REPORTING PLAN FOR THE HAPPY VALLEY PIPELINE PROJECT (Continued)

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Hazards and Hazardous Materials						
Measure 3.11-1: For construction of all facilities requiring excavation of more than 50 cubic yards of soil, the District or contractor will use a qualified professional to conduct a Phase I environmental site assessment in conformance with standards adopted by ASTM International. If the Phase I environmental site assessment indicates that a release of hazardous materials could have affected soil or groundwater quality at the site, the District will retain a qualified environmental professional to conduct a Phase II environmental site assessment to evaluate the presence and extent of contamination at the site, in conformance with state and local guidelines and regulations. If the results of the subsurface investigation(s) indicate the presence of hazardous materials, alteration of facility design or site remediation may be required by the applicable state or local regulatory agencies, and the contractors will be required to comply with all regulatory requirements for facility design or site remediation. The Phase I environmental site assessment will be completed within twelve months prior to construction to accurately estimate the conditions that could be expected during construction. For pipeline projects, the District or contractor will conduct an environmental database review to identify environmental cases, permitted hazardous materials uses, and spill sites within one-quarter mile of the pipeline alignment. Regulatory agency files will be reviewed for those sites that could potentially affect soil and groundwater quality within the pipeline alignment. The environmental database review will be completed within six months prior to construction to accurately estimate the conditions that could be expected during construction.	EBMUD and EBMUD's construction contractor	EBMUD	**Impact 3.11-1:** Exposure of workers and the public to hazardous materials that could be present in excavated soil, tunnel muck, or groundwater.			
			Impact 3.11-2 does not apply to the HVPL project, no mitigation required.			
			Impact 3.11-3 does not apply to the HVPL project, no mitigation required.			
Implement Measure 3.12-1c, as described in Section 3.12, Public Services and Utilities.			**Impact 3.11-4:** Rupture of a high-pressure gas line.			
			Impact 3.11-5 is less than significant for the HVPL project, no mitigation required.			
			Impact 3.11-6 is less than significant for the HVPL project, no mitigation required.			
			Impact 3.11-7 does not apply to the HVPL project, no mitigation required.			
Public Services and Utilities						
Measure 3.12-1a: Prior to excavation, the District or its contractors will 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.	EBMUD and EBMUD's construction contractor	EBMUD	**Impact 3.12-1:** Potential damage to or interference with existing public utilities.			
Measure 3.12-1b: The District or its contractors will find the exact location of underground utilities by safe and acceptable means, including the use of hand and modern techniques as well as customary types of equipment. Information regarding the size, color, and location of existing utilities must be confirmed before construction activities begin.	EBMUD and EBMUD's construction contractor	EBMUD				
Measure 3.12-1c: The District or its contractors will confirm the specific location of all high priority utilities (i.e. pipelines carrying petroleum products, oxygen, chlorine, toxic or flammable gases; natural gas in pipelines greater than 6 inches in diameter, or with normal operating measures, greater than 60 pounds per square inch gauge; and underground electric supply lines, conductors, or cables that have a potential to ground more than 300 volts that do not have effectively grounded sheaths) and such locations will be highlighted on all constructions drawings. In the contract specifications, the District will require that the contractor provide weekly updates on planned excavation for the upcoming week and identify when construction will occur near a high priority utility. On days when this work will occur, District construction managers will attend tailgate meetings with contractor staff to review all measures—those identified in the Mitigation Monitoring and Reporting Program and in the construction specifications—regarding such excavations. The contractor's designated health and safety officer will specify a safe distance to work near high-pressure gas lines, and excavation closer to the pipeline will not be authorized 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. The designated health and safety officer will provide written confirmation to the District that the line has been adequately located, and excavation will not start until this confirmation has been received by the District.	EBMUD and EBMUD's construction contractor	EBMUD				
Measure 3.12-1d: While any excavation is open, the District or its contractors will protect, support, or remove underground utilities as necessary to safeguard employees.	EBMUD and EBMUD's construction contractor	EBMUD				

APPENDIX A
MITIGATION MONITORING AND REPORTING PLAN FOR THE HAPPY VALLEY PIPELINE PROJECT (Continued)

Mitigation Measures Note: Highlighted mitigation measures are those from the WTTIP EIR that have been revised.	**Responsibility for Implementation**	**Responsibility for Monitoring**	**Impact(s) Being Mitigated**	**Check Box (Date)**	**Check Box (Date)**	**Check Box (Date)**
Public Services and Utilities (cont.)						
Measure 3.12-1e: The District or its contractors will 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.	EBMUD and EBMUD's construction contractor	EBMUD				
Measure 3.12-1f: The District or its contractors will contact utility owner if any damage occurs as a result of the project and promptly reconnect disconnected cables and lines with approval of owner.	EBMUD and EBMUD's construction contractor	EBMUD				
Measure 3.12-1g-HVPL: To the extent feasible, the District will 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.	EBMUD and EBMUD's construction contractor	EBMUD				
Measure 3.12-1h: The District or its contractors will coordinate final construction plans and specifications with affected utilities, such as PG&E.	EBMUD and EBMUD's construction contractor	EBMUD				
			Impact 3.12-2 is less than significant for the HVPL project, no mitigation required			
			Impact 3.12-3 is less than significant for the HVPL project, no mitigation required			
Measure 3.12-4a: The District will require project facility design and construction methods that produce less waste, or that produce waste that could more readily be recycled or reused.	EBMUD	EBMUD	**Impact 3.12-4:** Potential adverse effects on solid waste landfill capacity.			
Measure 3.12-4b: The District will include in its construction specifications a requirement for the contractor to describe plans for recovering, reusing, and recycling 50 percent of projected solid waste through construction, demolition, and excavation activities.	EBMUD's construction contractor	EBMUD				
Measure 3.12-5: The District will implement Measures 3.12-4a and 3.12-4b.	See above	See above	**Impact 3.12-5:** Potential failure to achieve state-mandated solid waste diversion rates.			
Cumulative Traffic						
Measure 5-1-HVPL: The District and/or its contractor(s) shall coordinate with the appropriate local government departments in Orinda and Contra Costa County and with other utility districts and agencies regarding the timing of construction projects that would occur near Miner Road and Van Ripper Lane. The coordinated plan shall include measures that address overlapping construction schedules and activities, truck arrivals and departures, land closures and detours, and the adequacy of on-street staging requirements. Specific measures to mitigate significant impacts could include employing flagmen during key construction periods, designating alternative haul routes, and providing more outreach and community noticing.	EBMUD	EBMUD	Cumulative Traffic Impacts (See Section 5.7.1)			
Growth-Inducement Potential and Secondary Effects of Growth						
Measure G-1: The EBMUD Board of Directors will work with other jurisdictions in the Lamorinda/Walnut Creek area to assist in mitigating the impacts of growth by: • Participating in efforts to improve regional planning in the Bay Area • Encouraging local land use planning agencies to coordinate land use planning functions and the provision of utility services • Encouraging cities and counties to adopt general plans and zoning ordinances that favor high-density development and urban in-filling (which tends to minimize per-capita water use and minimize the costs and environmental impacts of water delivery systems); to provide incentives for more housing near public transit; and to adopt ordinances that conserve open spaces, protect wildlife habitat, and conserve energy and water resources	EBMUD Board of Directors	EBMUD Board of Directors	**Impact G-1:** Secondary effects of planned growth.			

APPENDIX B

Plans and Policies

APPENDIX B
Plans and Policies

Land Use Plans and Policies

CITY OF ORINDA GENERAL PLAN		
Element	**Goals/Policies**	
Land Use		
Guiding Policies	2.1.1.A.	Maintain the semi-rural character of Orinda
	2.1.5.C.3	The East Bay Municipal Utility District Land may be the subject of a separate development plan if and when such property is not to be used for utility purposes. At such time, uses on this property shall be limited to recreation, open space; "affordable" multi-family housing or other uses as may be approved by the City, subject to approval of a plan for the site, and appropriate environmental review.
Open Space, Parks, Schools, and Utilities		
Guiding Policies	2.2.1.C	Retain steep or unstable slopes as open space
	2.2.1.D.	Retain creeks and wildlife access corridors as open space for preservation of natural resources, consistent with flooding control.
	2.2.4.B.	Seek cooperation of PG&E and EBMUD in managing landholdings to maximize community benefit and visual attractiveness, consistent with utility needs.

Visual Quality Plans and Policies

CITY OF ORINDA GENERAL PLAN		
Element	**Goals/Policies**	
Conservation		
Guiding Policies	4.1.1.E.	Protect creeks from siltation, pollution, and debris buildup to minimize the danger of flooding in storms, to retain the aesthetic and habitat values of the creeks in their natural state, and enhance and restore them where possible. Prohibit major channelization.
	4.1.1.F.	Achieve aesthetically sensitive grading that conforms to the natural contours, ensures safety and preserves trees and other vegetation to the greatest practical extent.

Geology and Soils Plans and Policies

CITY OF ORINDA GENERAL PLAN		
Element	**Goals/Policies**	
Safety		
Guiding Policies	4.2.1.A.	Geologic and seismic hazards shall be mitigated or development shall be located away from geologic and seismic hazards in order to preserve life and protect property.
	4.2.1.D.	Provide public protection from hazards associated with the use, storage and transportation of hazardous materials.
Implementing Policies	4.2.2.A.	A geotechnical investigation and report, including assessments of seismic and landslide risks shall be required for new development in Orinda, including single-family residences unless exempted by the City of Orinda. Any other facility that could create a geologic hazard, such as a road on hillside terrain, must also have such an investigation.
	4.2.2.B.	Evidence of probable geologic hazard will require a geotechnical study by a registered soil engineer or registered geologist to be reviewed by geotechnical consultants selected by the City.

Biological Resources Plans and Policies

CITY OF ORINDA GENERAL PLAN		
Element	**Goals/Policies**	
Conservation		
Guiding Policies	4.1.1.A.	Preserve Orinda's historic structures and sites, unique trees and landforms.
	4.1.1.B.	Preserve rare and endangered species.
	4.1.1.C.	Preserve valuable wildlife habitats, particularly riparian habitats.
	4.1.1.D.	Preserve oak woodlands and other native trees, and encourage planting and reforesting of oaks and other natives in hillside areas.
	4.1.1.E.	Protect creeks from siltation, pollution, and debris buildup to minimize the danger of flooding in storms, to retain the aesthetic and habitat values of the creeks in their natural state, and enhance and restore them where possible. Prohibit major channelization.
Implementing Policies	4.1.2.E.	Preserve drainage easements along creeks in order to protect adjacent buildings from flooding, and to preserve valuable riparian vegetation. Where riparian vegetation has to be disturbed for construction, revegetation with local riparian species is required. The City shall develop design Policies for development near creeks.

Cultural Resources Plans and Policies

CITY OF ORINDA GENERAL PLAN		
Element	**Goals/Policies**	
Conservation		
Guiding Policies	4.1.1.A.	Preserve Orinda's historic structures and sites, unique trees and landforms.
Implementing Policies	4.1.2.A.	Conduct an archival study of resources, map the general locations of resources, and review development proposals to determine the potential impacts on archaeological and historic resources and the need for more detailed study. Require additional study of development proposals on sites with moderate probability that such resources exist.

Traffic and Circulation Plans and Policies

CITY OF ORINDA GENERAL PLAN		
Element	**Goals/Policies**	
Circulation		
Guiding Policies	2.3.1.C	Strive to retain the existing peak hour level of service (LOS) of "C" or better at those intersections where is now prevails and improve the LOS at all other intersections.
Safety		
Implementing Policies	4.2.2.N.	Cooperate with other agencies to assure adequate medical and other emergency services.

Noise Plans and Policies

CITY OF ORINDA GENERAL PLAN		
Element	**Goals/Policies**	
Noise		
Guiding Policies	4.3.1.A.	Where practical, mitigate traffic noise to acceptable levels.
	4.3.1.B.	Prevent unnecessary noise from all sources.
Implementing Policies	4.3.2.C.	Develop ordinance to limit noise created by temporary activities such as building construction to the shortest duration possible, and to daytime hours whenever possible. All reasonable noise mitigation measures would be used.

SOURCE: City of Orinda General Plan, 1987. Last Amended 11-15-94

APPENDIX C
Air Quality Modeling Data

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 ***  SCREEN3 MODEL RUN  ***
 *** VERSION DATED 96043 ***

Happy Valley

SIMPLE TERRAIN INPUTS:
   SOURCE TYPE                =         AREA
   EMISSION RATE (G/(S-M**2))  =      .200000E-08
   SOURCE HEIGHT (M)          =       3.0000
   LENGTH OF LARGER SIDE (M)   =     135.0000
   LENGTH OF SMALLER SIDE (M)  =      15.0000
   RECEPTOR HEIGHT (M)        =       1.0000
   URBAN/RURAL OPTION         =        RURAL
THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

   MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION


BUOY. FLUX =     .000 M**4/S**3;  MOM. FLUX =     .000 M**4/S**2.

*** FULL METEOROLOGY ***

**********************************
*** SCREEN AUTOMATED DISTANCES ***
**********************************

*** TERRAIN HEIGHT OF    0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

  DIST     CONC             U10M   USTK  MIX HT   PLUME  MAX DIR
   (M)   (UG/M**3)   STAB  (M/S)  (M/S)    (M)   HT (M)   (DEG)
-------  ----------  ----  -----  -----  ------  ------  -------
     1.   .1373E-01    4     1.0    1.0   320.0    3.00      0.
   100.   .3402E-01    6     1.0    1.0 10000.0    3.00      0.
   200.   .2701E-01    6     1.0    1.0 10000.0    3.00      0.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND     1. M:
   120.   .3537E-01    6     1.0    1.0 10000.0    3.00      0.

     ************************************
     *** SUMMARY OF SCREEN MODEL RESULTS ***
     ************************************

 CALCULATION        MAX CONC    DIST TO   TERRAIN
  PROCEDURE        (UG/M**3)    MAX (M)    HT (M)
--------------    -----------   -------   -------
SIMPLE TERRAIN      .3537E-01      120.        0.


************************************************
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
************************************************
```

Happy Valley Pipeline

Assumed Equipment Fleet

Cut and Cover 30 miles on-road truck travel/day	1 Air Compressor (for jack hammer)
	1 Concrete Saw
	1 Paving Equipment
	1 Compactor
	1 Roller
	1 Rough Terrain Forklift
	1 Dozer
	1 Water Truck
	1 Tractor/Loader/Backhoe
Creek Crossing	1 Air Compressor (for jack hammer)
	1 Excavator
	1 Paver
	1 Compactor
	1 Roller
	1 Tractor/Loader/Backhoe
	1 Bobcat
Pipe Bursting	1 Air Compressor
	1 Generator Set
	1 Compactor
	1 Loader
	1 Tractor/Loader/Backhoe

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\Sara Gerrick\Application Data\Urbemis\Version9a\Projects\Happy Valley Pipeline Construction.urb924

Project Name: EBMUD Happy Valley Pipeline Construction

Project Location: Alameda County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2011 TOTALS (tons/year unmitigated)	0.23	1.57	0.96	0.00	0.33	0.10	0.43	0.07	0.10	0.16	160.40
2011 TOTALS (tons/year mitigated)	0.23	1.35	0.96	0.00	0.02	0.02	0.04	0.01	0.02	0.02	160.40
Percent Reduction	0.00	13.81	0.00	0.00	92.71	81.30	89.93	92.51	81.32	85.96	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

2011	0.23	1.57	0.96	0.00	0.33	0.10	0.43	0.07	0.10	0.16	160.40
Mass Grading 05/01/2011-07/31/2011	0.16	1.19	0.69	0.00	0.33	0.07	0.40	0.07	0.07	0.14	122.72
Mass Grading Dust	0.00	0.00	0.00	0.00	0.33	0.00	0.33	0.07	0.00	0.07	0.00
Mass Grading Off Road Diesel	0.15	1.07	0.58	0.00	0.00	0.07	0.07	0.00	0.06	0.06	97.52
Mass Grading On Road Diesel	0.01	0.11	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.74
Mass Grading Worker Trips	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.46
Asphalt 08/01/2011-08/30/2011	0.04	0.22	0.16	0.00	0.00	0.02	0.02	0.00	0.02	0.02	22.64
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.04	0.22	0.14	0.00	0.00	0.02	0.02	0.00	0.02	0.02	20.08
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60
Paving Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.96
Building 09/01/2011-09/30/2011	0.03	0.15	0.11	0.00	0.00	0.01	0.01	0.00	0.01	0.01	15.05
Building Off Road Diesel	0.03	0.15	0.10	0.00	0.00	0.01	0.01	0.00	0.01	0.01	14.69
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29

Phase Assumptions

Phase: Mass Grading 5/1/2011 - 7/31/2011 - Cut and Cover

Total Acres Disturbed: 4

Maximum Daily Acreage Disturbed: 1

Fugitive Dust Level of Detail: Default

10 lbs per acre-day

On Road Truck Travel (VMT): 135.56

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day

1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 8 hours per day

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1 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

1 Rough Terrain Forklifts (93 hp) operating at a 0.6 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 8/1/2011 - 8/30/2011 - Creek Crossing

Acres to be Paved: 1

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Skid Steer Loaders (44 hp) operating at a 0.55 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 9/1/2011 - 9/30/2011 - Pipe Bursting

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Construction Mitigated Detail Report:

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CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2011	0.23	1.35	0.96	0.00	0.02	0.02	0.04	0.01	0.02	0.02	160.40
Mass Grading 05/01/2011-07/31/2011	0.16	1.03	0.69	0.00	0.02	0.01	0.04	0.01	0.01	0.02	122.72
Mass Grading Dust	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.15	0.91	0.58	0.00	0.00	0.01	0.01	0.00	0.01	0.01	97.52
Mass Grading On Road Diesel	0.01	0.11	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.74
Mass Grading Worker Trips	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.46
Asphalt 08/01/2011-08/30/2011	0.04	0.19	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.64
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.04	0.19	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.08
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60
Paving Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.96
Building 09/01/2011-09/30/2011	0.03	0.13	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.05
Building Off Road Diesel	0.03	0.13	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.69
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 5/1/2011 - 7/31/2011 - Cut and Cover

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

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For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Rubber Tired Dozers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Rubber Tired Dozers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Water Trucks, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Water Trucks, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Concrete/Industrial Saws, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Concrete/Industrial Saws, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Rough Terrain Forklifts, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Rough Terrain Forklifts, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Paving Equipment, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Paving Equipment, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Rollers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Rollers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Plate Compactors, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Plate Compactors, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Air Compressors, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Air Compressors, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

The following mitigation measures apply to Phase: Paving 8/1/2011 - 8/30/2011 - Creek Crossing

For Pavers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Pavers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Rollers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Rollers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Excavators, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Excavators, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Air Compressors, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Air Compressors, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Skid Steer Loaders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Skid Steer Loaders, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Plate Compactors, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Plate Compactors, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

The following mitigation measures apply to Phase: Building Construction 9/1/2011 - 9/30/2011 - Pipe Bursting

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Air Compressors, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Air Compressors, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Generator Sets, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Generator Sets, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Plate Compactors, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Plate Compactors, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

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For Rubber Tired Loaders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Rubber Tired Loaders, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\Sara Gerrick\Application Data\Urbemis\Version9a\Projects\Happy Valley Pipeline Construction.urb924

Project Name: EBMUD Happy Valley Pipeline Construction

Project Location: Alameda County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2011 TOTALS (lbs/day unmitigated)	4.88	36.69	21.28	0.01	10.03	2.31	12.34	2.10	2.12	4.22	3,775.92
2011 TOTALS (lbs/day mitigated)	4.88	31.74	21.28	0.01	0.73	0.46	1.19	0.16	0.42	0.58	3,775.92

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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Time Slice 5/2/2011-7/29/2011 Active Days: 65	**4.88**	**36.69**	**21.28**	**0.01**	**10.03**	**2.31**	**12.34**	**2.10**	**2.12**	**4.22**	**3,775.92**
Mass Grading 05/01/2011-07/31/2011	4.88	36.69	21.28	0.01	10.03	2.31	12.34	2.10	2.12	4.22	3,775.92
Mass Grading Dust	0.00	0.00	0.00	0.00	10.00	0.00	10.00	2.09	0.00	2.09	0.00
Mass Grading Off Road Diesel	4.58	33.03	17.71	0.00	0.00	2.17	2.17	0.00	2.00	2.00	3,000.63
Mass Grading On Road Diesel	0.22	3.53	1.14	0.01	0.02	0.13	0.15	0.01	0.12	0.12	545.75
Mass Grading Worker Trips	0.08	0.13	2.42	0.00	0.01	0.01	0.02	0.00	0.00	0.01	229.54
Time Slice 8/1/2011-8/30/2011 Active Days: 22	3.46	20.35	14.66	0.00	0.01	1.63	1.65	0.00	1.50	1.51	2,057.83
Asphalt 08/01/2011-08/30/2011	3.46	20.35	14.66	0.00	0.01	1.63	1.65	0.00	1.50	1.51	2,057.83
Paving Off-Gas	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	3.26	19.89	12.66	0.00	0.00	1.62	1.62	0.00	1.49	1.49	1,825.04
Paving On Road Diesel	0.02	0.35	0.11	0.00	0.00	0.01	0.01	0.00	0.01	0.01	54.25
Paving Worker Trips	0.06	0.10	1.89	0.00	0.01	0.00	0.01	0.00	0.00	0.01	178.53
Time Slice 9/1/2011-9/30/2011 Active Days: 22	2.57	13.95	9.68	0.00	0.00	1.10	1.10	0.00	1.01	1.01	1,367.92
Building 09/01/2011-09/30/2011	2.57	13.95	9.68	0.00	0.00	1.10	1.10	0.00	1.01	1.01	1,367.92
Building Off Road Diesel	2.56	13.90	9.38	0.00	0.00	1.09	1.09	0.00	1.01	1.01	1,335.35
Building Vendor Trips	0.00	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.46
Building Worker Trips	0.01	0.02	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.12

Phase Assumptions

Phase: Mass Grading 5/1/2011 - 7/31/2011 - Cut and Cover

Total Acres Disturbed: 4

Maximum Daily Acreage Disturbed: 1

Fugitive Dust Level of Detail: Default

10 lbs per acre-day

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On Road Truck Travel (VMT): 135.56

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day

1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 8 hours per day

1 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

1 Rough Terrain Forklifts (93 hp) operating at a 0.6 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 8/1/2011 - 8/30/2011 - Creek Crossing

Acres to be Paved: 1

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Skid Steer Loaders (44 hp) operating at a 0.55 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 9/1/2011 - 9/30/2011 - Pipe Bursting

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 5/2/2011-7/29/2011 Active Days: 65	**4.88**	31.74	**21.28**	**0.01**	0.73	0.46	1.19	0.16	0.42	0.58	**3,775.92**
Mass Grading 05/01/2011-07/31/2011	4.88	31.74	21.28	0.01	0.73	0.46	1.19	0.16	0.42	0.58	3,775.92
Mass Grading Dust	0.00	0.00	0.00	0.00	0.70	0.00	0.70	0.15	0.00	0.15	0.00
Mass Grading Off Road Diesel	4.58	28.08	17.71	0.00	0.00	0.33	0.33	0.00	0.30	0.30	3,000.63
Mass Grading On Road Diesel	0.22	3.53	1.14	0.01	0.02	0.13	0.15	0.01	0.12	0.12	545.75
Mass Grading Worker Trips	0.08	0.13	2.42	0.00	0.01	0.01	0.02	0.00	0.00	0.01	229.54
Time Slice 8/1/2011-8/30/2011 Active Days: 22	3.46	17.36	14.66	0.00	0.01	0.26	0.27	0.00	0.24	0.24	2,057.83
Asphalt 08/01/2011-08/30/2011	3.46	17.36	14.66	0.00	0.01	0.26	0.27	0.00	0.24	0.24	2,057.83
Paving Off-Gas	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	3.26	16.91	12.66	0.00	0.00	0.24	0.24	0.00	0.22	0.22	1,825.04
Paving On Road Diesel	0.02	0.35	0.11	0.00	0.00	0.01	0.01	0.00	0.01	0.01	54.25
Paving Worker Trips	0.06	0.10	1.89	0.00	0.01	0.00	0.01	0.00	0.00	0.01	178.53
Time Slice 9/1/2011-9/30/2011 Active Days: 22	2.57	11.86	9.68	0.00	0.00	0.17	0.17	0.00	0.15	0.15	1,367.92
Building 09/01/2011-09/30/2011	2.57	11.86	9.68	0.00	0.00	0.17	0.17	0.00	0.15	0.15	1,367.92
Building Off Road Diesel	2.56	11.82	9.38	0.00	0.00	0.16	0.16	0.00	0.15	0.15	1,335.35
Building Vendor Trips	0.00	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.46
Building Worker Trips	0.01	0.02	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.12

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Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 5/1/2011 - 7/31/2011 - Cut and Cover

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Rubber Tired Dozers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Rubber Tired Dozers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Water Trucks, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Water Trucks, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Concrete/Industrial Saws, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Concrete/Industrial Saws, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Rough Terrain Forklifts, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Rough Terrain Forklifts, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Paving Equipment, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Paving Equipment, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Rollers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Rollers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Plate Compactors, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Plate Compactors, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Air Compressors, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Air Compressors, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

The following mitigation measures apply to Phase: Paving 8/1/2011 - 8/30/2011 - Creek Crossing

For Pavers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Pavers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Rollers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Rollers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

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For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Excavators, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Excavators, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Air Compressors, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Air Compressors, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Skid Steer Loaders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Skid Steer Loaders, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Plate Compactors, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Plate Compactors, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

The following mitigation measures apply to Phase: Building Construction 9/1/2011 - 9/30/2011 - Pipe Bursting

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Air Compressors, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Air Compressors, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Generator Sets, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

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PM10: 85% PM25: 85%

For Generator Sets, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Plate Compactors, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Plate Compactors, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Rubber Tired Loaders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Rubber Tired Loaders, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%