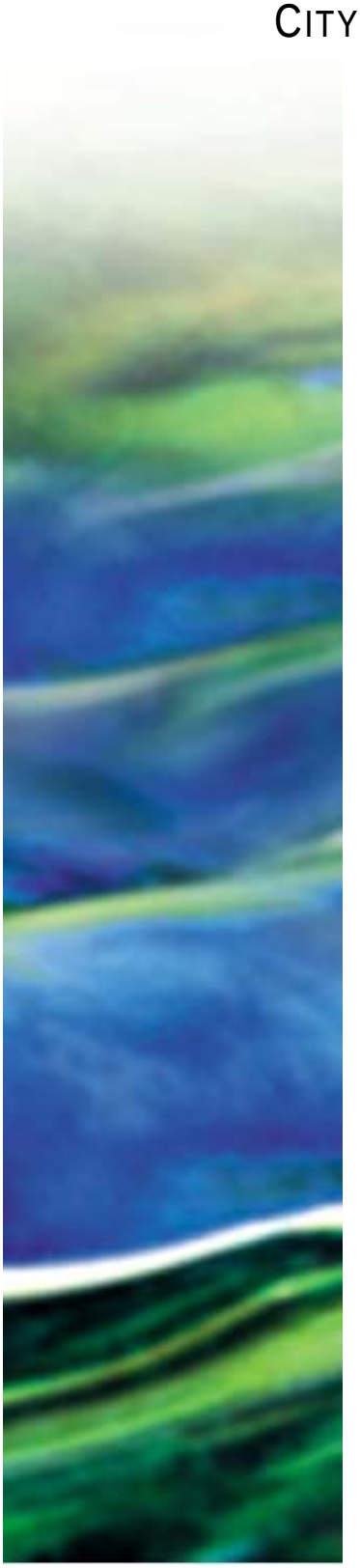
Attachment D

Draft Initial Study/Proposed Mitigated Negative Declaration for the City of Brentwood Recycled Water Project

INITIAL STUDY / PROPOSED MITIGATED NEGATIVE DECLARATION
CITY OF BRENTWOOD RECYCLED WATER PROJECT



Prepared for:

THE CITY OF BRENTWOOD
HERITAGE ▪ VISION ▪ OPPORTUNITY

CITY OF BRENTWOOD
WASTEWATER OPERATIONS

Prepared by:

RBI ROBERTSON - BRYAN, INC.
Solutions for Progress

April 2015

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April 2015

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ACRONYMS AND ABBREVIATIONS

AFY	acre-feet per year
AQMP	Air Quality Management Plan
ARB	California Air Resources Board
BMPs	Best Management Practices
CAA	federal Clean Air Act
CAAQS	California Ambient Air Quality Standards
CCAA	California Clean Air Act
CESA	California Endangered Species Act
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CFS	cubic feet per second
CH_4	methane
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CY	cubic yards
DDW	Division of Drinking Water (State Water Resources Control Board)
DTSC	Department of Toxic Substances Control
ECCID	East Contra Costa Irrigation District
ECCCHCP	East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan
EC	electrical conductivity (or specific conductance)
ESA	federal Endangered Species Act
GHG	greenhouse gas emissions
GPM	gallons per minute
hp	horsepower
MG	million gallons
MGD	million gallons per day
msl	mean sea level
NAAQS	National Ambient Air Quality Standards
NOAA Fisheries	National Oceanic and Atmospheric Administration
N_2O	nitrous oxide

NOx	nitrogen oxide
NO_3	nitrate
NPDES	National Pollution Discharge Elimination System
O_3	ozone
Pb	lead
$PM_{2.5}$	particulate matter 2.5 microns in diameter
PM_{10}	particulate matter 10 microns in diameter or smaller
ROG	reactive organic gases
RRPS	Roddy Ranch Pump Station
SDWA	Safe Drinking Water Act
SFBAAB	San Francisco Bay Area Air Basin
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminants
TDS	total dissolved solids
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VMT	vehicle miles traveled

1 INTRODUCTION

1.1 REGULATORY GUIDANCE AND PURPOSE OF THIS DOCUMENT

This document has been prepared in accordance with the California Environmental Quality Act (CEQA), Public Resources Code §21000 et seq., and the State CEQA Guidelines, Title 14 California Code of Regulations (CCR) 15000 et seq. This Initial Study (IS) was prepared by the City of Brentwood (City) to determine if the proposed Recycled Water Project (Proposed Project) could have significant impacts on the environment. In accordance with CEQA Guidelines 15064(a), an Environmental Impact Report (EIR) must be prepared if there is substantial evidence that a project may have significant impacts on the environment. If the Lead Agency for the CEQA process determines that there is no substantial evidence for such impacts, or if the potential impacts can be reduced through revisions to the project or mitigation measures, a Negative Declaration (ND) or Mitigated Negative Declaration (MND) can be prepared (CEQA Guidelines 15070). The City, as the CEQA lead agency for the Proposed Project, has determined that an IS/MND is the appropriate document for compliance with CEQA and the CEQA Guidelines. The City is the Lead Agency for the Proposed Project.

The City intends to apply to the State Water Resources Control Board (SWRCB) for funding under the Water Recycling Fund Program (WRFP) loan program, which is partially funded by the U.S. Environmental Protection Agency (USEPA). Because federal funds would be used for the Proposed Project, compliance with the National Environmental Policy Act (NEPA) and other applicable federal environmental regulations is required. For compliance with the federal regulations, the USEPA established specific "CEQA-plus" requirements with the SWRCB for administering the WRFP that provide for the CEQA-plus process to serve as the functionally equivalent compliance process for NEPA, and compliance with the other applicable federal regulations. Accordingly, this CEQA document contains information regarding relevant and applicable federal regulations, and in particular supporting information for compliance with the Federal Endangered Species Act, National Historic Preservation Act, and General Conformity Rule of the Clean Air Act.

1.2 PUBLIC REVIEW OF THE DOCUMENT

In accordance with Section 15073 of the CEQA Guidelines, this document will be circulated to local, state, and federal agencies and to interested organizations and individuals who may wish to review and comment on it. In reviewing this IS and proposed mitigation measures, affected public agencies and the interested public should focus on whether the document sufficiently identifies and analyzes the possible impacts on the environment.

A 30-day review and comment period for the IS/MND has been established in accordance with §15205(d) of the State CEQA Guidelines. This IS/MND is available for public review on the City's website (www.brentwoodca.gov/cd/planning/ceqa.asp) and during regular business hours at the City's Operations Division office (150 City Park Way, Brentwood, CA 94513). The 30-day public review period for the document is April 8, 2015 to May 8, 2015 at 5:00 p.m. Written comments on the IS/MND will be accepted during the comment period. Written comments

(including via E-mail), must be submitted to the City by 5:00 p.m. on May 8, 2015. Postmarks after the close of the public review period will not be acceptable.

Written, E-mail or faxed comments should be addressed to:

Mr. Chris Ehlers
Assistant Director Public Works/Operations
150 City Park Way
Brentwood, California 94513
Email: dept-pubwork@brentwoodca.gov
Fax: (925) 516-6061

Following the close of the public review period, the City Council will consider the IS/MND, and public comments received on the document, for potential adoption of the MND.

1.3 DOCUMENT ORGANIZATION

This document is organized in the following manner:

- Section 1, Introduction. This section provides an introduction and describes the purpose, scope, and organization of this document.

- Section 2, Project Description. This section describes the purpose and need of the Proposed Project, project objectives, and a description of the project's characteristics.

- Section 3, Environmental Checklist. This chapter provides an environmental setting for the Proposed Project and analyzes the potential environmental impacts of the Proposed Project. Resource topics appear in the order that they appear in Appendix G (Environmental Checklist) of the State CEQA Guidelines. Mitigation measures are incorporated and discussed, where appropriate, to reduce "potentially significant" impacts to a "less-than-significant" level. Mandatory Findings of Significance also are presented in this section.

- Section 4, List of Preparers. This section identifies a list of people that assisted in the preparation of this document

- Section 5, References. This section identifies the references used in the preparation of this document.

2 PROJECT DESCRIPTION

2.1 BACKGROUND AND PROJECT PURPOSE

The proposed project is located primarily within the City of Brentwood's current boundaries in Contra Costa County, as shown in **Figure 1**. Additionally, the Roddy Ranch Golf Course that is located west of the City, and currently receives raw water via the non-potable distribution system, is included in the project area.

The Brentwood Wastewater Treatment Plant (WWTP) provides service to wastewater customers within the City boundaries. Wastewater consists of primarily domestic residential connections with limited commercial customers. No industrial uses occur within the service area. The current population is approximately 53,000 and is projected to be about 76,000 at build out per the current General Plan. The WWTP consists of a headworks (screening and grit removal), two anoxic basins, two extended aeration activated sludge basins, two denitrification basins, two secondary clarifiers, two banks of two single media filters (total of four filters), chlorine disinfection, dechlorination, and a cascade aeration system for discharge of treated effluent to Marsh Creek. The surface discharge to Marsh Creek is authorized by the Central Valley Regional Water Quality Control Board ("Central Valley Water Board") under a National Pollution Discharge Elimination System (NPDES) permit (No. CA0085201, Order No. R5-2013-0106) issued in 2013 for the current design average dry weather flow (ADWF) capacity of the WWTP of 5.0 million gallons per day (MGD). The current average dry weather wastewater inflow rate to the WWTP is 3.7MGD based on flows measured in 2014 (June through August).

A large majority of the treated WWTP effluent is discharged on a year-round basis to Marsh Creek, a perennial stream located within the jurisdictional area of the Sacramento-San Joaquin Delta (Delta). The term "recycled water" refers to the Title 22 tertiary treated wastewater that is distributed to irrigation customers during the summer months through the City's non-potable water supply system, which conveys both recycled water and raw water supplied by the East Contra Costa Irrigation District (ECCID). The City's non-potable water system includes a network of transmission and distribution pipelines and pump stations. Irrigation customer demands for recycled water reach a peak rate of about 0.25 MGD during the summer irrigation season.

The production and distribution of recycled water is authorized in the City's Master Reclamation Permit (MRP, Order No. R5-2004-0132) issued by the Central Valley Water Board, in coordination with approvals from the SWRCB, Division of Drinking Water (DDW). The Central Valley Water Board issues the MRP to protect all water resource beneficial uses pursuant to California Water Code (CWC) provisions (§§13500-13530) and policies and procedures of the Regional Water Quality Control Plan (Basin Plan). DDW has oversight of water reclamation under Title 22 of the California Code of Regulations (CCR), Division 4, Chapter 3 (§60301 et seq.) for human health protection from recycled water uses.

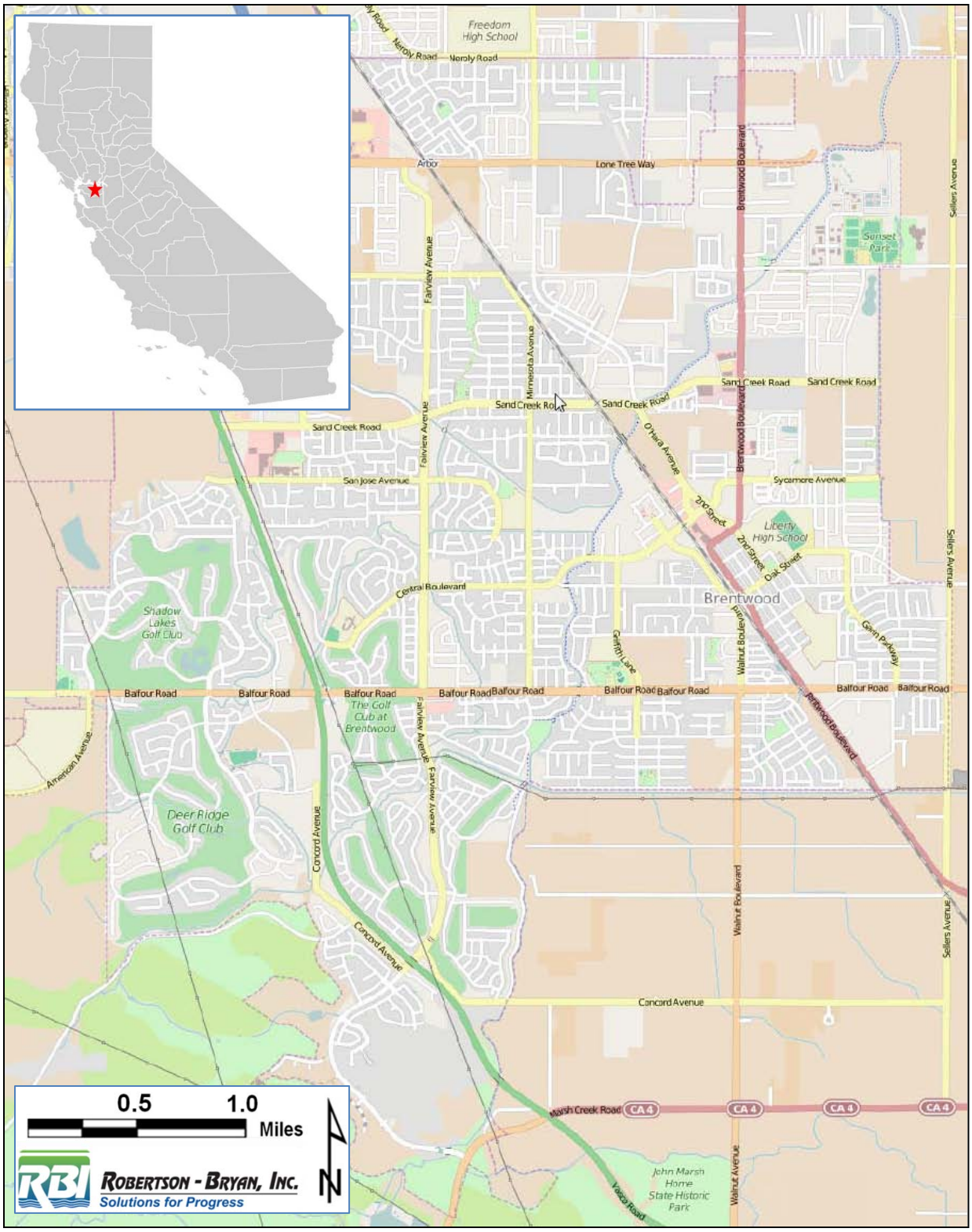

Figure 1. Location Map of City of Brentwood and Brentwood WWTP.

The Title 22 regulations include water quality criteria, treatment process requirements, and treatment reliability criteria for water reclamation operations. The Title 22 tertiary recycled water produced at the WWTP is suitable for "unrestricted" reuse activities where humans are unlikely to come into contact with, or ingest, the water (e.g., irrigation of food and fodder crops, landscape irrigation, fire hydrants, street sweeping, dust control, carwash facilities, fountains, evaporative cooling or power plant cooling facilities, etc.). DDW exercises its authority over recycled water through reviewing of permit applications and engineering reports, and making recommendations for the terms and conditions in the permit issued by the Central Valley Water Board.

2.2 PROJECT PURPOSE AND OBJECTIVES

The purpose of the Proposed Project is to maximize the use of recycled water within the City. In doing so, the City seeks to meet several related objectives including achieving a more cost-effective irrigation supply for the City and customers, contribute to achieving compliance with chloride objectives for the WWTP effluent discharge to Marsh Creek, contributing to overall water conservation, and increasing the reliability of the City's available water supplies. These project objectives are described below.

Cost-Effective Irrigation Water Supply System: A key objective of the Proposed Project is to reduce the City's current per volume costs of raw Delta water purchases and water treatment associated with use of potable water for irrigation purposes in the non-potable water distribution system.

NPDES Permit Compliance for Chloride: The City was issued a compliance schedule in the NPDES permit requiring compliance with the chloride effluent limitation by January 1, 2018 and the implementation of expanded recycled water uses by December 31, 2016. Therefore, a key objective of the Proposed Project is to reduce effluent discharge and loading of chloride to Marsh Creek by maximizing use of recycled water.

Water Conservation: Cities must meet the more stringent water management targets of the Water Conservation Act of 2009, which established the goal of a 20 percent statewide reduction in urban per capita water use by 2020. The increased use of recycled water in the City is identified as an objective of the City's 2010 Urban Water Management Plan. Increased use of recycled water would incrementally reduce Delta water diversions and groundwater use to help meet the City's conservation goals.

Water Supply Reliability: While ECCID's Delta water supply is generally reliable, the Delta is considered vulnerable to potential catastrophic events such as seismic- or flooding-induced levee failure, severe drought resulting in low Delta freshwater inflow, and future climate change and related sea level rise, all of which could result in greater intrusion of high-salinity seawater into the Delta. Seawater intrusion could lead to extended periods of unsuitable water quality conditions in the Delta. However, the source of recycled water is treated effluent, which originates from freshwater delivered to homes and businesses that must use it for drinking, washing, cleaning and sanitation. These uses

are not discretionary and are generally unaffected by drought conditions. Homes and businesses will continue critical freshwater uses regardless of any restrictions placed on outdoor water use (e.g. car washing, irrigation with potable water). As a result, recycled water is considered a "drought-proof", and thus reliable, water supply for landscape irrigation uses in the City.

2.3 DISCRETIONARY ACTIONS AND REGULATORY ACTIONS FOR THE PROPOSED PROJECT

The CEQA compliance process for the Proposed Project is intended to support several discretionary actions by the City, as follows:

- Development of ordinances, rules, and permits for uses of the recycled water by City customers (as necessary).
- Requests for bids for construction of the recycled water facilities, and subsequent contracts and agreements for the construction activities.
- Issuance of construction and/or grading permits to the construction contractors for the Proposed Project features.

The CEQA process also is intended to support the regulatory actions that may to be necessary for approval of the Proposed Project by other federal, State, and local agencies, and be used by other State responsible agencies that may have an interest in reviewing the project. The following list identifies the primary regulatory permits anticipated to be:

- State Water Resources Control Board
    - Petition for a change in the place and purpose of use of the wastewater effluent currently discharged to Marsh Creek
- Central Valley Water Board
    - Application for authorization as a producer of recycled water under the new General Waste Discharge Requirements for Recycled Water Use (Order WQ 2014-0090) adopted by the SWRCB on June 3, 2014. Upon receiving coverage under this General Order, the City's MRP will be rescinded.
- California Department of Fish and Wildlife – consultation under the California Endangered Species Act (as necessary).
- National Oceanic and Atmospheric Administration – consultation under the federal Endangered Species Act (as necessary).

2.4 PROPOSED PROJECT FACILITIES AND CONSTRUCTION ACTIVITIES

Planning for the City's proposed expansion of the recycled water system was documented in two technical reports, *Recycled Water Feasibility Study for the City of Brentwood* ("Feasibility Study", Robertson-Bryan, Inc. 2013) and a supplemental memorandum (*Update to Recycled Water Feasibility Study*, Robertson-Bryan, Inc. 2014), together referred herein as "Feasibility Study Update". The Feasibility Study Update evaluated the existing and potential future landscape irrigation demands for recycled water, and the cost-effective alternative distribution system features that would be necessary to supply customers with recycled water. The following sections describe the proposed facilities recommended in the Feasibility Study Update and required to expand the recycled water distribution system, the construction activities, and long-term operations for the Proposed Project.

2.4.1 Recycled Water and Non-potable Water Customers and Distribution Facilities

The City's existing recycled water and non-potable water distribution facilities consist of dedicated pipelines and pump stations to serve existing recycled water and non-potable irrigation customers, respectively. **Figure 2** shows the existing recycled water and non-potable water pipelines in the City, and locations of current irrigation customers of recycled, non-potable, or potable water that could reasonably be included in the proposed expansion of recycled water service. The City owns and operates an existing recycled water pump station located at the WWTP containing three 50 horsepower (hp) pumps, and relies on the non-potable Roddy Ranch Pump Station (RRPS) with four 100 hp pumps located near the intersection of Fairview Ave. and Arlington Way. There are no existing recycled water or non-potable water storage reservoirs in the system.

The Feasibility Study Update identified three categories of existing landscape irrigation customers in the City:

- Existing recycled water users
- Existing raw water users
- Existing potable water users

The City currently delivers recycled water to seven landscape irrigation customers in addition to several City properties and school ball fields that are all located in the northeast corner of the City near the WWTP. The combined demand for existing customers in the system as of mid-2014 is 196 acre-feet per year (AFY). There are many customers currently connected to the non-potable distribution system that receive raw water. These customers already have appropriate plumbing to receive recycled water. Most of these customers are located in the southwest corner of the City, along or near Balfour Rd. The Roddy Ranch Golf Course and the Trilogy at the Vineyards development are included in this set of customers identified in the Feasibility Study Update as Phase A customers. The combined demand for these customers is 1,242 AFY. The irrigation water demands for the customers to receive recycled water from the Alternative A2 alignment (the alternative Phase A alignments are described below) are shown in **Table 1**.

Table 1. Summary of Recycled Water Demands.

Parameter	Existing	Existing Potential (Phase A2)	Future Potential (to 75% Use) [a]			Total
			Phase B1	Phase B2	Phase B3	
Annual Demand (AFY)	196	1242	508	223	262	2431
Peak Day Demand (GPM)	273	1735	709	311	366	3394
Peak Day Demand (MGD)	0.39	2.50	1.02	0.45	0.53	4.89
Peak Hour Demand (GPM)	729	3502	1890	829	976	7926
Peak Hour Demand (MGD)	1.05	5.04	2.72	1.19	1.41	11.41
Number of Customers	17	50	36	15	28	146

[a] Only those customers whose average day demand contributed to the top 75% of the total irrigation demand were included in this assessment, since customers below this threshold would likely have very high cost/demand.

The third and largest category of customers currently irrigate with potable water, and are identified in the Feasibility Study Update as future potential recycled customers, or Phase B customers. Due to the relatively high marginal costs of extending recycled water distribution facilities to individual low-demand customers, only those customers with average day water demands within the top 75% of the average day demand of all potential customers were considered for inclusion in the recycled water system (i.e., identified as about 50 potential City properties and private customers). The purpose of this 75% threshold is to recognize the diminishing value of providing recycled water in lieu of potable water to 100% of this customer class. The combined demand for the Phase B customers (the sum of Phase B1, B2, and B3 in Table 1) is estimated to be 993 AFY. The irrigation water demands for three subgroups of Phase B customers (i.e., see description of the B1-B3 customers below) are shown in Table 1.

Additionally, three other golf courses are located in the City that are not currently irrigated by any City water supply (i.e., Shadow Lakes Golf Course and Deer Ridge Golf Course, both 18-hole courses, and the Brentwood Country Club, a 27-hole course). These three potential customers have an estimated combined demand for irrigation water of about 1,392 AFY

2.4.2 Proposed Recycled Water Distribution System Features

The expansion of the City's recycled water distribution system was evaluated in the Feasibility Study Update by considering existing and future potential customers, seasonal irrigation water demands, and engineering and economic considerations for the distribution system components consisting of pipelines, storage tanks, and pumping stations. Modeling was conducted using EPANET 2.0 software developed by the United States Environmental Protection Agency that simulates water movement within pressurized pipe networks. The pipe network consists of pipes, nodes (junctions), pumps, valves, and storage tanks. The EPANET model tracks the flow of water in each pipe, the pressure at each node, and the height of the water in each tank. The recycled water distribution system was planned to meet the peak daily recycled water demand requirements of the customers. Peak demand and deliveries of recycled water systems typically occur during nighttime irrigation during July, the maximum demand month. The peak flow demands were estimated by applying peaking factors to average day demands. The following

sections describe the proposed distribution system pipelines and alignment alternatives considered, recycled water storage, and pumping stations necessary for the Proposed Project.

Distribution System Pipelines and Alignment Alternatives

The Proposed Project includes the facilities needed to expand the recycled water system to Phase A customers currently irrigating with non-potable water. **Figure 3** shows the proposed new pipelines to be constructed, and additional irrigation customers that would be served by the recycled water system. Due to hydraulic constraints of the existing non-potable water pipeline that supplies non-potable water to the Roddy Ranch pump station (and the majority of existing non-potable water customers in the southwest portion of the city), pipeline capacity improvements were identified in the Feasibility Study Update to convey recycled water from the WWTP to the RRPS site. Four alternative pipeline alignments were identified in the Feasibility Study Update (Alternatives A1 through A4) for one section of alignment that traverses the area from the eastern City boundary to the Union Pacific Railroad track and, westerly to Fairview Ave. Alternative A2 (Sand Creek Rd. to Fairview Ave.) was recommended in the Feasibility Study Update as the City's preferred route, and would consist of new pipeline segments along Sand Creek Rd. for most of its length from Brentwood Blvd. to Fairview Ave. The Alternative A2 customers are interchangeably known as Phase A2 customers. A new 16-inch pipe segment would connect to the existing 20-inch recycled water pipeline located at the eastern City boundary, and run parallel to an existing 12-inch pipe under Sand Creek Rd. From these two pipes, a new 20-inch pipe would extend to join an existing 18-inch pipe that crosses the Union Pacific Railroad tracks. Another 20-inch pipe would connect the existing 18-inch pipe to an existing 18-inch pipe near Fairview Ave.

The City is pursuing purchase of a 22-inch natural gas pipeline that underlies Fairview Ave. from Lone Tree Way to State Route 4. If purchased, the gas pipeline may be used to directly convey recycled water, or a new 18-inch recycled water pipeline would be "sleeved" into the gas pipeline to convey the recycled water, from Grant St. to the RRPS area. Since the gas pipeline has not been purchased to date, this IS was prepared on the basis that the City would construct a new18-inch pipeline along the Fairview Ave. alignment between Grant St. and immediately west of the RRPS. With these Alternative A2 assumptions, a total of approximately 17,143 feet of new pipeline construction would be required. However, this CEQA document is considered to also fully address the potential environmental effects of sleeving the gas pipeline, if in fact the City selects that method of construction; because the temporary construction-related activities to sleeve the pipe would involve less disturbance than the open-trench methods for new pipe construction described in Section 2.5.1 below. If the City chooses to use the gas pipeline to directly carry recycled water, it is assumed that the pipeline would be clean of any residual contaminants associated with its prior use for natural gas conveyance.

Through the Feasibility Study Update process, the City identified three groups of potential additional recycled water customers as Phase B1, B2, and B3 based on cost-effectiveness considerations (e.g., distance to available pipeline, demand, etc.). Some of the Phase B customers, Phase B1, are already located near the existing non-potable distribution system, and thus would only require retrofits to receive recycled water. Other customers would require

construction of new pipelines and retrofits. The Phase B1 customers are shown in Figure 3 and all are located nearest to the existing non-potable water system or close to pipelines constructed for Alternative A2, and thus, are considered the cost-effective set of initial Phase B customers to include in the Proposed Project at this time. Phase B1 would serve 20 customers throughout the City adjacent to existing non-potable pipelines, and an additional 16 customers that would be located near the Alternative A2 alignment along Sand Creek Rd. To serve the Phase B1 customers would require construction of only 300 feet of new 6-inch pipeline, in addition to the pipelined described above for Alternative A2. The combined demand for the Phase B1 customers is 508 AFY.

The Phase B2 and B3 categories of customers, and the three additional golf courses not currently irrigated with City water, are not recommended for inclusion in the Proposed Project at this time due primarily to the currently insufficient wastewater inflows and corresponding insufficient recycled water production to meet the total irrigation water demands of these customers. These phases would be constructed as subsequent projects in the future as the City's population grows. Phase B2 would expand the recycled water distribution system into the northwest corner of the City, and Phase B3 would involve the extension of recycled water service to generally individual customers located throughout various locations of the City.

Recycled Water Storage Tanks

Peak wastewater flows and corresponding recycled water production occur during daylight hours, and thus do not coincide with typical peak nighttime landscape irrigation demands. Because of the offsetting timing of available recycled water production and irrigation demands, the water balance modeling of the recycled water distribution system indicates an insufficient recycled water supply to meet peak hourly water demands with both the Phase A and Phase B1 system expansions. In particular, the irrigation water application of large private customers such as golf courses, if occurring over short periods of nighttime/early morning hours, can substantially increase the peak hourly water demands as opposed to irrigation application rates that are metered evenly over a 24-hour daily period. Consequently, to meet peak demands, conservatively account for potential underestimation of peak hourly irrigation water demands of the largest customers, and to provide extra storage for operational flexibility, a total storage of 4.0 million gallons (MG) is required to support the Phase A and Phase B1 customers (Feasibility Study Update). Two aboveground storage tanks are included in the project to allow water to be fed into the distribution pipeline network from two locations to better meet peak demand, minimize pipeline hydraulic inefficiencies, and provide storage redundancy.

The two storage tank locations are shown in Figure 3, with one tank located at the WWTP site and the second tank located near the RRPS site (refer to **Figure 4** and **Figure 5)**. Two alternative locations for the storage tank are being considered at the RRPS (Figure 4) and two alternative storage tank locations are being considered for the WWTP site (Figure 5). The actual tank locations for each site would be determined through the City's final design of the recycled water facilities. The preliminary recommendation is for the tanks at the RRPS and WWTP to

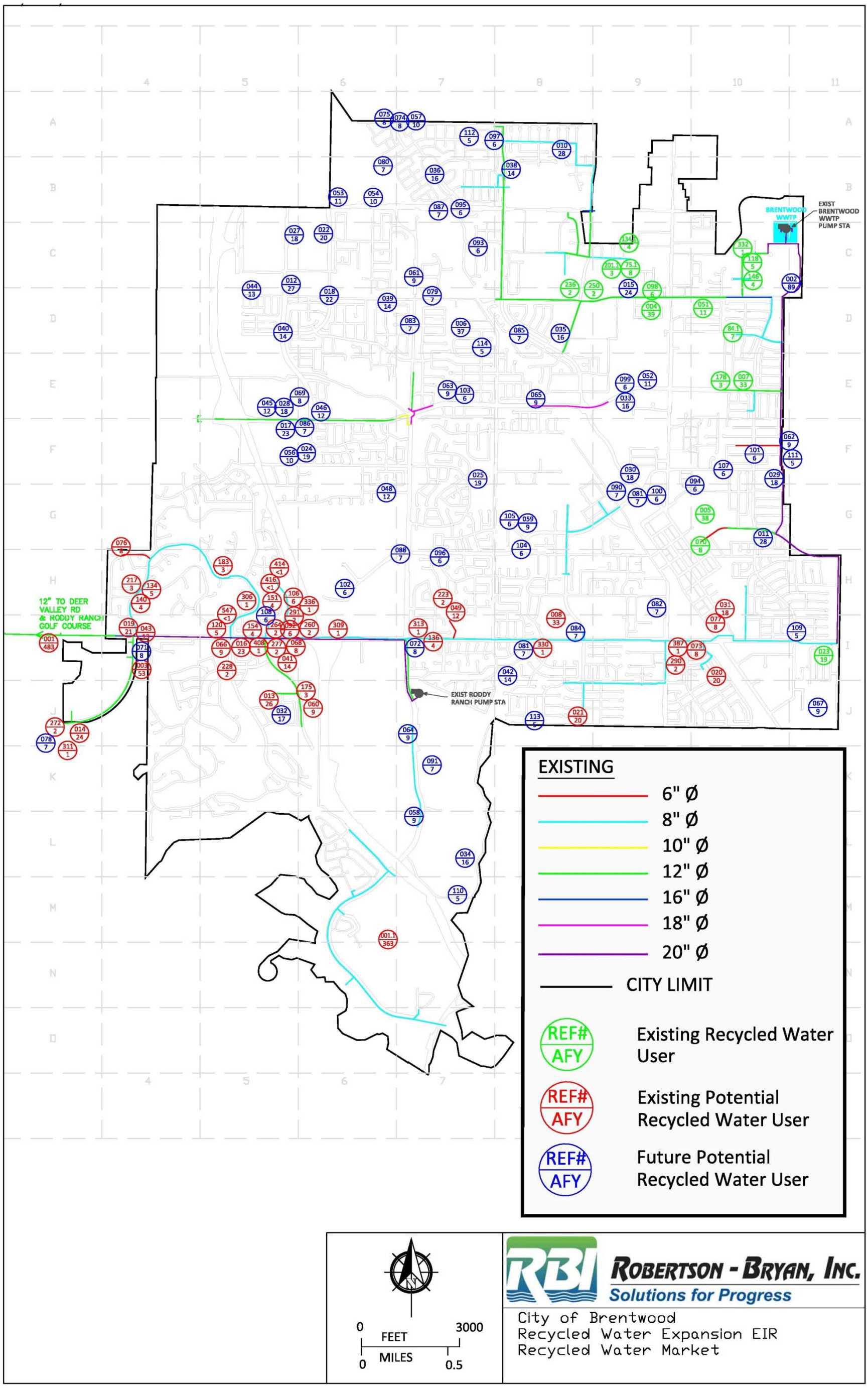

Figure 2. Existing Recycled Water and Non-potable Water Distribution Systems and Customers.

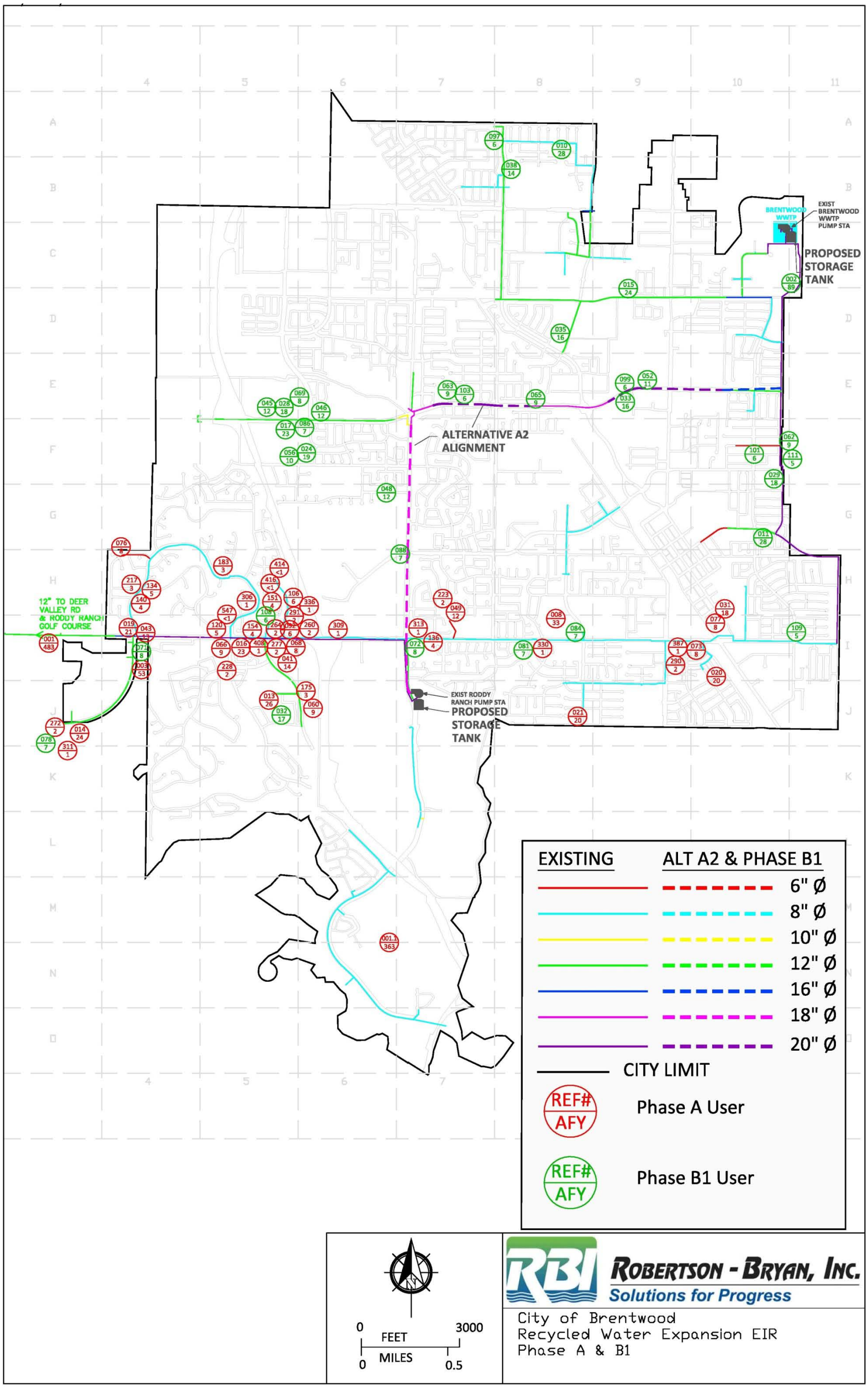

Figure 3. Proposed Expanded Recycled Water Distribution System and Customers (Alternative A2 and Phase B1 Facilities).

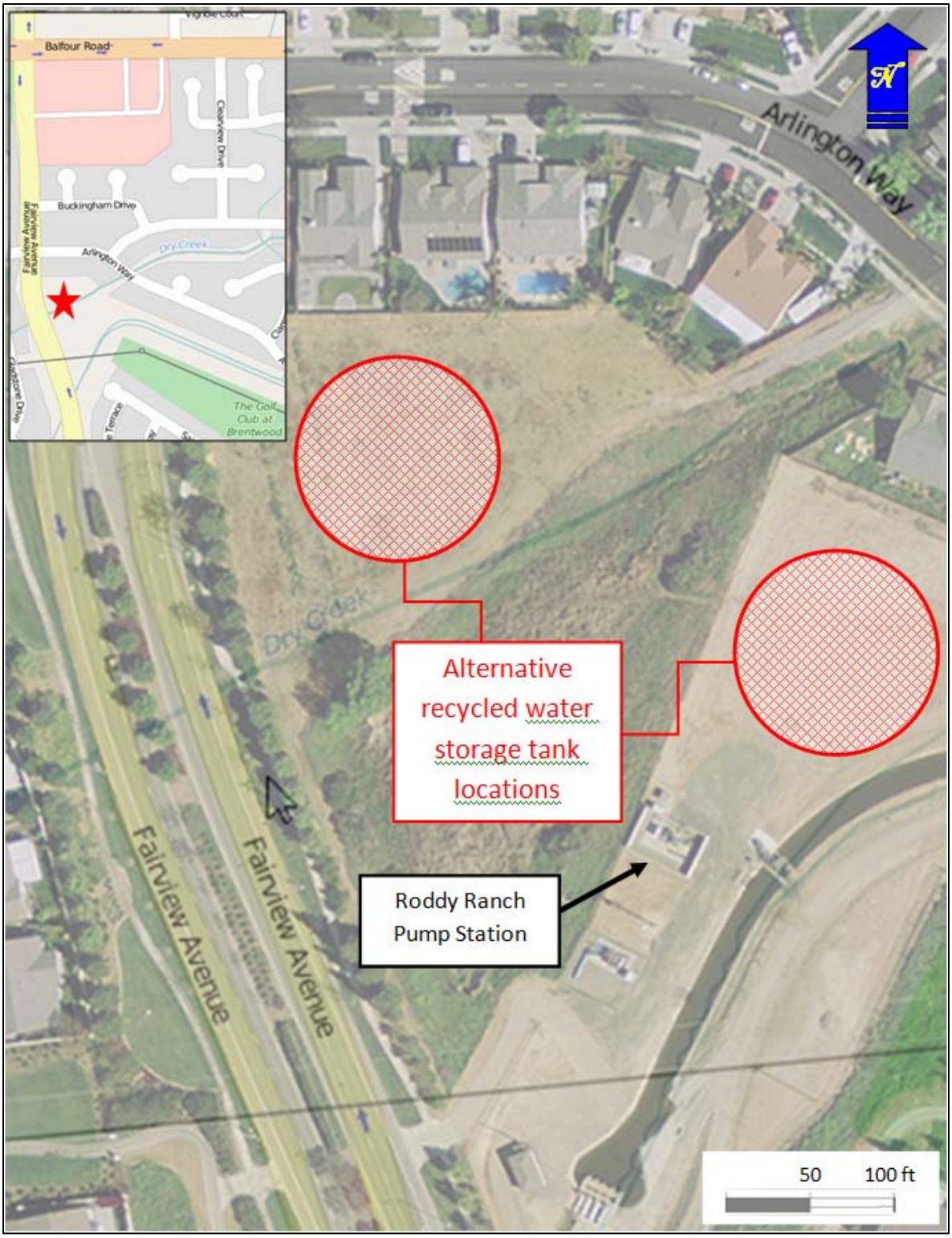

Figure 4. Site Plan for Recycled Water Storage Tank at the Roddy Ranch Pump Station Location.

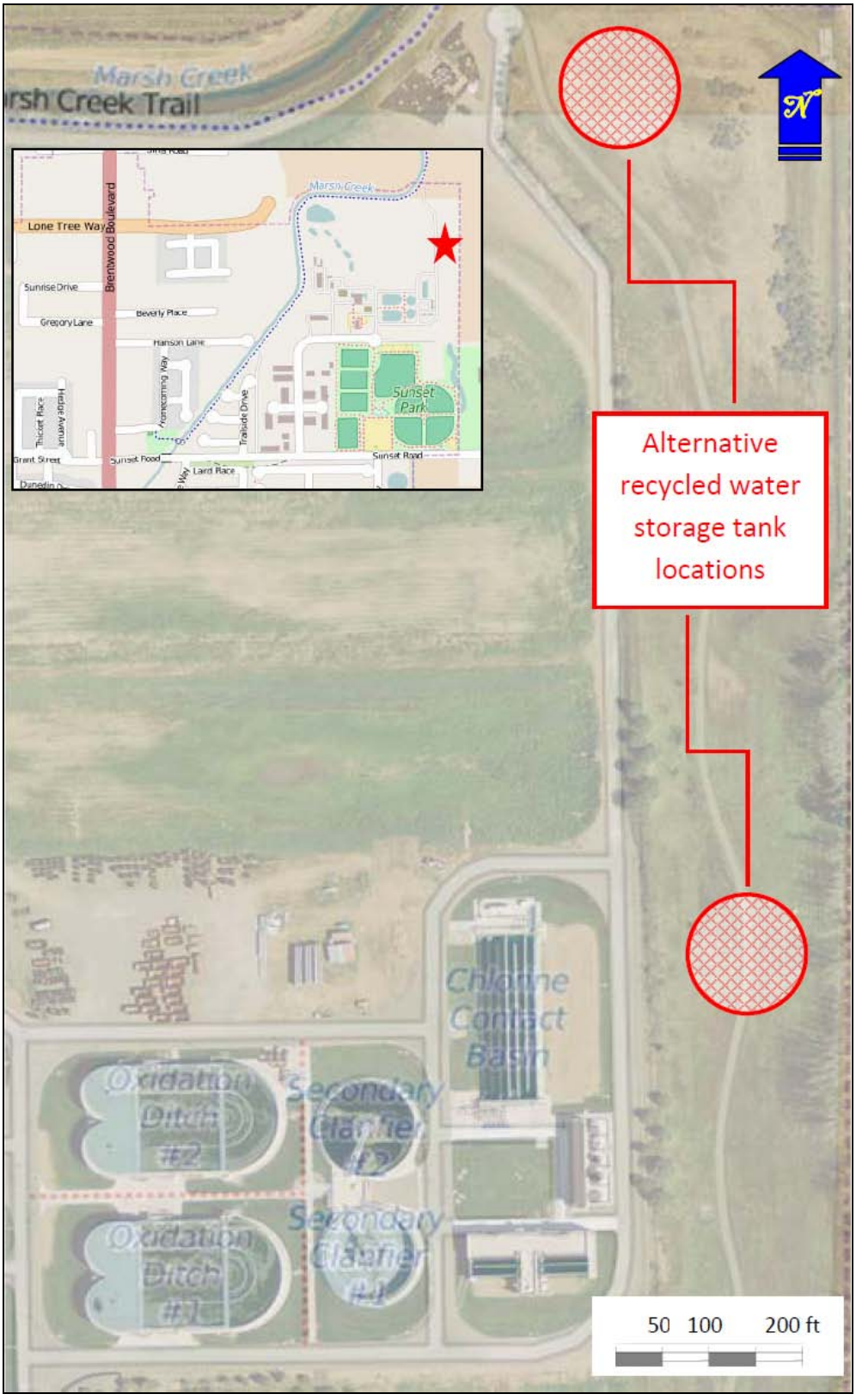

Figure 5. Site Plan for Recycled Water Storage Tank at the WWTP Location.

provide up to 3.0 MG capacity each. However, tanks may be downsized to 2.0 MG at each location. The actual distribution of the storage capacity between the two locations, and thus the final sizes of the tanks, also would be determined through the City's final design process. Tanks with 3.0 MG capacity and 30-ft height would have a diameter of about 130 feet. Tanks with 2.0 MG capacity and 30-ft height would have diameters of about 110 feet.

Pumping Stations

The hydraulic modeling indicates that the existing RRPS has sufficient capacity to serve the Phase A2 and Phase B1 customers with recycled water as a booster pump station. The arrangement of new piping and related equipment (e.g., valves, supplemental pump for tank) to tie the new storage tank supply into the existing RRPS, or directly into the existing pipeline, would be determined through the City's final design process. Additional pumping capacity equivalent to 250 hp would be installed at the existing WWTP pump station. The number, type, and capacity of individual pumps that would be installed also would be determined through the final design process. A summary of the pipeline, pumping station, and storage components for the Proposed Project is provided in **Table 2**.

Table 2. Summary of Facilities Included in the Proposed Project and Additional Irrigation Demands and Costs.

Facility	Proposed Project Alt. A2 and Phase B1
Brentwood WWTP Pump Station	Add up to 250 hp additional pump capacity to the existing pump station
Roddy Ranch Pump Station	Existing Roddy Ranch Pump Station and new tie-in equipment to the pipeline
Storage Tanks	4 MG total storage (separate single tanks at Brentwood WWTP and Roddy Ranch Pump Station)
User Retrofits	35
Pipelines	
6" (urban, lineal feet)	300
16" (urban, lineal feet)	1,789
18" (urban, lineal feet)	8,461
20" (urban, lineal feet)	6,593
Total pipeline (lineal feet)	17,143
Additional Demands and Costs	
Additional Recycled Water Demand (AFY)	1,750
Total Present Value Cost	$13.1 Million

Existing power supplies, and backup diesel generator capacity at the WWTP, are sufficient for the additional facilities at the RRPS and WWTP. The additional recycled water use from the

WWTP located at an elevation of about 50 feet above mean sea level (msl) would reduce the amount of water currently pumped from lower elevation sources (i.e., Delta and groundwater wells). The reduced net lift necessary to convey recycled water to customers compared to delivery of Delta/groundwater sources would result in a net energy annual savings of approximately 120,000kWh.

2.5 CONSTRUCTION METHODS

2.5.1 Pipelines

The Proposed Project would include installation of new recycled water pipelines ranging in size from 6 to 20 inches in diameter that would be installed within or immediately adjacent to existing paved roads and roadway shoulders. Pipeline construction activities would occur in the following order: pavement removal, trench excavation, pipeline installation, pipeline testing, connection to existing pipelines, trench backfilling, and road repaving. All drainage channel crossings along the new pipeline alignments are anticipated to be crossed via attachment to existing infrastructure such as bridge structures and any actively flowing stream channel would not be disturbed. Pipelines would generally be installed using open-cut trench methods using saw-cutting of existing pavement to define the trench corridor, followed by the use of excavators, backhoes, or trenching machines to excavate the trench. Trenches would be excavated to minimum dimensions of approximately two feet wide by four feet deep, and up to a maximum of about three feet wide by six feet deep, depending on the size of pipe installed. Trench and pipeline construction would occur in segments of approximately 300-feet of open trench, with an work rate of no less than about 100 feet per day (i.e., for the largest pipe sizes), thereby minimizing the short-term construction-related disturbances to residents adjacent to the immediate work area. Repaving would likely occur approximately five days per month.

If the City decides to sleeve the natural gas pipeline that currently underlies Fairview Ave., rather than constructing a new pipeline, the sleeving would be accomplished by excavating work pits at several locations along the length of the existing pipeline. These pits would serve as entrance and exit locations for workers to insert the plastic carrier pipe. The annular space between the gas pipeline and the new recycled water pipeline would be filled with a grout or sand slurry to stabilize the recycled water pipe. The excavated pits would then be backfilled, and pavement restored, as described above.

Constraints at some locations may render open-trench construction infeasible (e.g., presence of busy road intersections or other utilities, geotechnical considerations, etc.). Such constraints, if any, are undetermined at this time and would be identified through the final design process. If needed, alternative pipeline installation methods not involving open trench construction would be used such as the jack and bore method, or directional drilling. These boring methods involve excavation of entrance and exit pits, and development of adjacent staging areas for equipment and materials. The size of the pits depend on the length and depth of boring required, but are typically about 10 by 30 feet wide and less than 20 feet deep. The jack and bore method involves advancing a drilling auger and pipe casing from the entrance to exit areas. Hydraulic jacks push the pipe casing through the bore behind the auger. Horizontal directional drilling

involves a two-step process. First, a small pilot bore is created using a guided cutting head, followed by reaming the bore with an auger to enlarge the diameter of the bore to accommodate the pipeline (or casing). The pipe casing is then pulled through the borehole from the exit pit back to the entrance. Directional drilling typically requires pumping and pressurized injection and circulation of a drilling fluid, typically a slurry of bentonite (an inert clay), to lubricate the drill bit, help to keep the bore hole wall from collapsing, and convey cuttings from the bore hole as the drill bit or reaming tool is advanced. The drilling slurry and soil cuttings may be suitable for mixing with soil and disposal onsite, or also may be hauled offsite for appropriate reuse or disposal.

After installation, the new pipelines would be tested to ensure that they meet pressure and leakage specifications. Following pipeline testing and connection to existing pipelines, the open trenches would be backfilled with aggregate or other controlled density fill. The original (current) ground contours would be reestablished over the pipelines and the trench cut alignments would be repaved to their pre-project condition, per the City's standard practices. Existing culverts, driveway entrances, or other features that are damaged or require removal as part of project construction would be replaced in-kind. Steel plates or base pavement would be installed if excavated area is left open at the end of each day. Paving of the disturbed roads would occur periodically throughout the pipeline installation process. Excess material excavated during trench construction would be disposed of on city property, private property (under landowner agreements), or at a landfill that accepts construction-generated wastes.

2.5.2 Storage Tanks and Pumping Stations

Construction activities for the storage tanks would involve site preparation, including vegetation removal, grubbing, grading, excavation, placement of fill, and compaction. Each storage tank would be placed at or near existing grade and supported on a poured footing and concrete slab. The construction materials for the tanks would consist of welded steel, concrete, or a combination of these materials and constructed in place over the course of approximately 3 months. The perimeter area around each storage tank would be compacted and paved with asphalt or provided with a crushed rock surface following construction.

Construction activities for the installation of additional pumps at the WWTP recycled water pumping station would require minimal disturbance to excavate an area to access the existing recycled water wet well and install piping connections for the pump impellers, construct the support structures for the additional above-ground pumps, and complete all piping and electrical connections. Alternatively, a dedicated pump station may be constructed near the tank to supply the pressure and flow requirements to the distribution system. The decision on the pump station will be made during final design.

2.5.3 Construction Equipment and Use

Table 3 lists the types of equipment that may be used during construction on an as-needed basis. An anticipated peak day of construction activity for the Proposed Project would likely occur in association with heavy earthmoving or concrete placement activities for the storage tanks sites, and would involve use of 3 to 4 pieces of equipment for approximately 10 hours per day. During

a given day, 8 to 10 truck trips would be made to access a tank site construction area. A peak day of pipeline construction activity would involve the use of trenching, pipe placement, and backfilling operations and involve 2 to 3 pieces of equipment and 15 to 20 delivery trips of pipeline segments and suitable backfill material. Work activities for the tank sites and pipeline construction may occur simultaneously on a given day. The anticipated peak daily construction workforce for the Proposed Project is approximately 20 workers and the average number of workers for the duration of construction would be approximately 10 workers. Construction would generally be performed between 7 a.m. and 6 p.m., Monday through Friday.

Table 3. Typical Construction Equipment and Associated Construction Activity.

Construction Equipment	Construction Activity
Air compressor	All construction activities
Asphalt cutter machine	Pipeline construction
Asphalt delivery dump truck	Paving
Asphalt roller machine	Paving
Asphalt spreading machine	Paving
Compressor/generator	All construction activities
Concrete truck	Storage tank construction
Delivery and dump trucks	All construction activities
Dozer	Storage tank construction
Excavator (rubber-tired or track-propelled)	All construction activities
Fuel/oil service truck	All construction activities
Generator	All construction activities
Horizontal directional boring machine	Pipeline construction
Pickup truck	All construction activities
Pipe fusion machine	Pipeline construction
Power hand tools	All construction activities
Rubber tired backhoe	All construction activities
Rubber tired loader	All construction activities
Sheepsfoot roller	All construction activities
Small compactor	All construction activities
Truck and trailer for delivery of pipe and other materials	Pipeline construction
Water truck	Storage tank construction
Welder, trailer or truck mounted	All construction activities

2.5.4 Construction Area Access and Staging

During the construction period, the work areas would be accessed from the existing paved roads and rights-of-way and would not require the creation of any new access roads. Sufficient area for staging of equipment and construction materials during construction is available within the

perimeter fencing of the WWTP site. Staging would be avoided at sensitive areas such as riparian or other habitat.

2.5.5 Traffic Control

Traffic control within construction areas would be provided in accordance with the latest edition of *Caltrans' Manual of Uniform Traffic Control Devices*. Construction of pipelines across street intersections would require potential temporary street closures and/or traffic detours. However, any road closures require City Engineer approval and a detour plan would be provided for review and approval prior to any closure.

2.5.6 Construction Schedule and Phasing

The proposed project schedule anticipates construction occurring in 2015, and requiring 8 to 12 months to complete. All of the schedule dates must be considered approximate. Current delivery of recycled water and non-potable water to customers would not be substantially affected during the project construction, and any temporary interruptions would be anticipated to last for no more than 1 or 2 days.

2.6 PROPOSED PROJECT OPERATIONS

The monthly average irrigation water demands for the Phase A2 customers, and total Phase A2 and Phase B1 customer demands, are shown in **Figure 6** relative to the projected recycled water production in 2017, which reflects the recycled water available for the year when the recycled water system will be completed. Figure 6 shows that the recycled water demand for the Phase A2 and Phase B1 customers exceeds, or nearly exceeds, the projected recycled water available in the months of May through August. A substantial surplus of recycled water/effluent exists in the other months of the year with less irrigation demands (i.e., September through June) reflects the amount of treated wastewater effluent that would continue to be discharged to Marsh Creek.

The primary operational change with implementation of the Proposed Project is the seasonal reduction in effluent discharge to Marsh Creek during primarily the months of May through August. **Figure 7** shows the existing background average monthly streamflow in Marsh Creek upstream of the WWTP (RSW-001) and the existing streamflow downstream of the WWTP (with effluent discharge). Figure 7 shows that the corresponding projected average monthly Marsh Creek streamflow and effluent discharge with the Proposed Project in 2017.

Operation and maintenance of the Proposed Project facilities would consist primarily of annual flushing of pipelines during the winter months to remove sediment that may have collected during the year. Water flushed from the system would be sent to the sewer pipelines for conveyance to the WWTP for treatment. The responsibility for recycled water irrigation operations, and associated compliance with the Title 22 reclamation requirements would lie primarily with the recycled water customers.

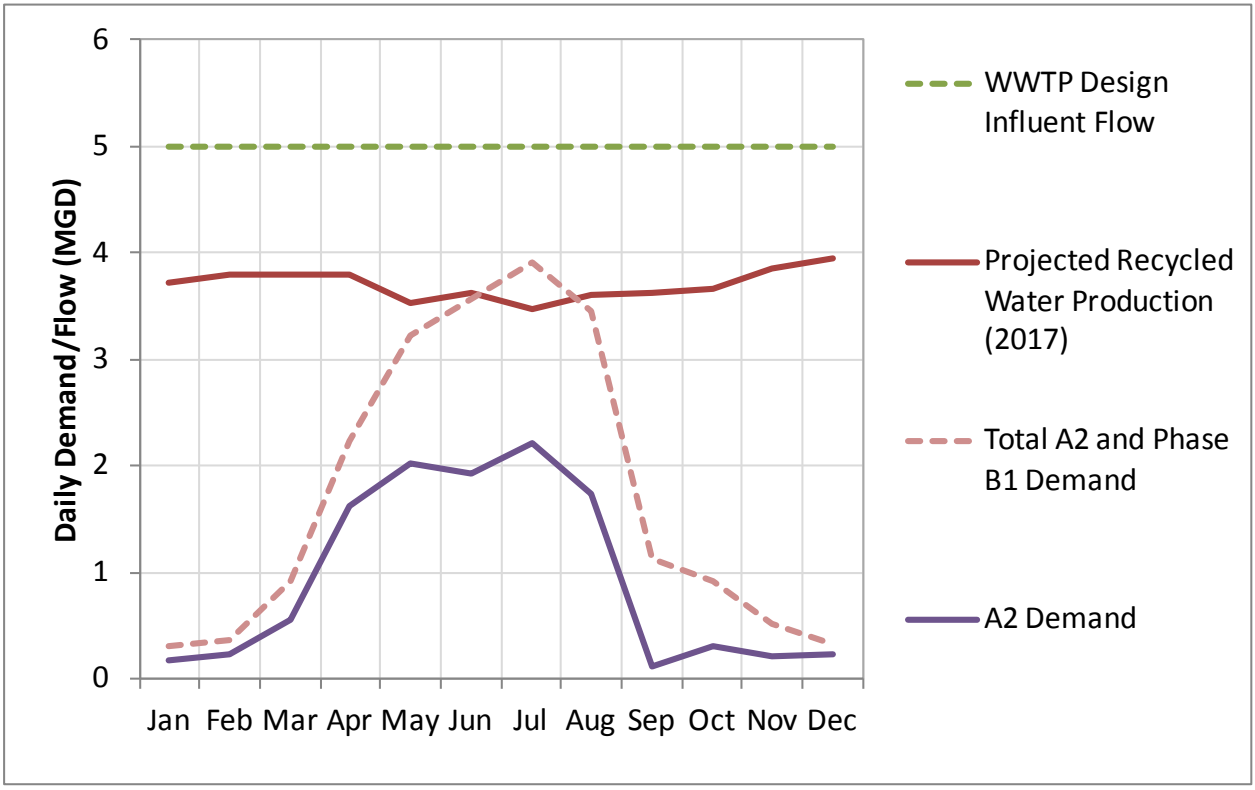

Figure 6. Monthly Estimated Recycled Water Supply and Demand for Phase A and B1 Customers.

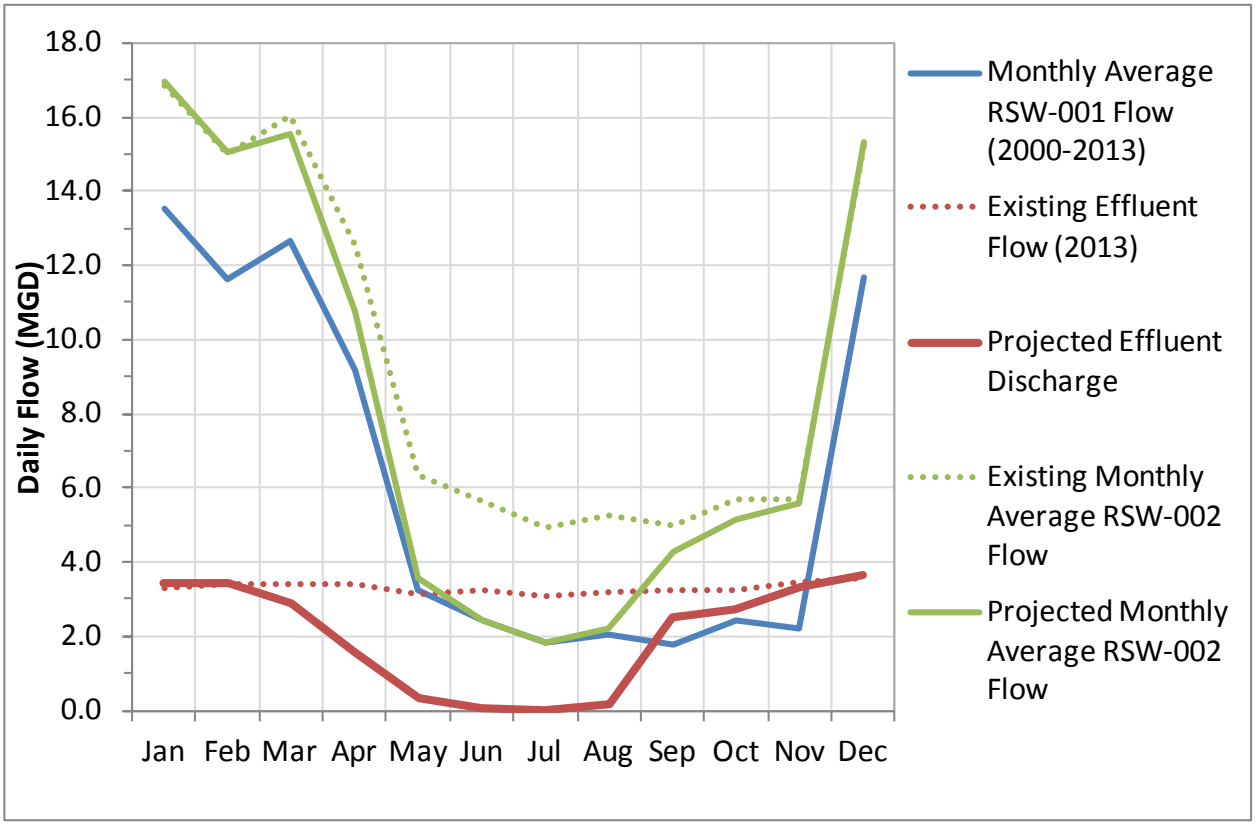

Figure 7. Estimated Monthly Average Marsh Creek Streamflow for the Proposed Project.

3 ENVIRONMENTAL CHECKLIST

PROJECT INFORMATION		
1.	Project Title:	City of Brentwood Recycled Water Project
2.	Lead Agency Name and Address:	City of Brentwood (Contra Costa County)
3.	Contact Person and Phone Number:	Mr. Chris Ehlers
4.	Project Location:	City of Brentwood
5.	Project Sponsor's Name and Address:	n/a
6.	General Plan Designation:	Variable (residential, public facility)
7.	Zoning:	Variable planned development zones, public facility
8.	Description of Project: (Describe the whole action involved, including but not limited to later phases of the project, and any secondary, support, or off-site features necessary for its implementation. Attach additional sheets if necessary.) See Chapter 2, Project Description	
9.	Surrounding Land Uses and Setting: (Briefly describe the project's surroundings)	See Chapter 2, Project Description
10:	Other public agencies whose approval is required: (e.g., permits, financing approval, or participation agreement)	None

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agriculture and Forest Resources	☐ Air Quality
☒ Biological Resources	☒ Cultural Resources	☒ Geology / Soils
☐ Greenhouse Gas Emissions	☐ Hazards & Hazardous Materials	☒ Hydrology / Water Quality
☐ Land Use / Planning	☐ Mineral Resources	☒ Noise
☐ Population / Housing	☐ Public Services	☐ Recreation
☐ Transportation / Traffic	☐ Utilities / Service Systems	☒ Mandatory Findings of Significance

3.1 AESTHETICS

	Would the project…	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant Impact	No Impact
a)	Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☑
b)	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☑
c)	Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☑	☐
d)	Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☑

3.1.1 Setting

The City's General Plan identifies State Route 4, Camino Diablo Rd. (Rd.), Marsh Creek Rd., Walnut Rd. (Blvd.), Deer Valley Rd., Lone Tree Way, and the SR4 Bypass as scenic routes; however, there are no officially designated State Scenic Highways in the City (City of Brentwood 2014a). Mount Diablo and the Diablo Range are visually prominent scenic vistas in the view westward from the Brentwood area.

The Conservation and Open Space (COS) element of the General Plan addresses the protection of visual resources in Goal COS 7, as follows: *Protect hillsides and ridgelines from visual impacts and erosion.* Policy COS 7-3 addresses protection of "prominent community views of scenic resources, including Mount Diablo, local hills and ridgelines, and open space areas surrounding Brentwood".

3.1.2 Discussion

a) The proposed project would not remove mature trees or other structures for construction, and involves only the construction of buried pipelines and two large recycled water storage tanks. The storage tank locations are not visible from scenic routes, and would not adversely affect any community views of Mount Diablo or the ridgelines from scenic routes or public spaces. Therefore, there would be **no impact**.

b) There are no designated scenic highways in the Brentwood area, and no rock outcroppings or historic buildings or structures would be affected by the construction activities. Therefore, there would be **no impact**.

c) Both natural and artificial landscape features contribute to perceived visual images and the scenic attractiveness of a landscape. Scenic attractiveness is influenced by vegetation pattern, water characteristics, landforms, recreational features, and rural and urban features. Individuals respond differently to changes in the physical environment based on their experiences of the environment prior to changes, the extent and nature of those changes, and

the proximity and duration of their views. The aesthetic value of an area is therefore a subjective measure of the visual character and scenic quality.

Construction activities would involve temporary visual disturbances along the pipeline alignments; however, all pipes would be buried and not result in any permanent aesthetic effects. The two alternative storage tank locations at the WWTP site are located in the rear of the WWTP site and visible from the Marsh Creek trail, with visibility limited from public roads. The storage tank at the WWTP would not appreciably change the visual character of the site because it would be consistent with the other unit process tanks, clarifiers, and buildings that comprise the WWTP. The alternative tank locations at the RRPS site are level grassland and gravel covered open areas visible from the surrounding residential neighborhoods and Fairview Ave.. Visual character of the site includes the ECCID Main Canal, RRPS facilities, high-voltage power lines, Dry Creek channel with a wetland area, Fairview Ave. corridor, and residential areas. The proposed storage tank would be visible from the back yards of the surrounding residential areas and Fairview Ave. However, it would be an additional feature generally consistent with the other visually diverse features at the site. Moreover, the relatively small area of the tank (i.e., 0.35 acres) would not substantially block views or change the visual character of the site. Therefore, the impact would be **less than significant.**

d) Final engineering and architectural design of the Proposed Project has not occurred. Storage tank paint color would likely be a light, neutral earth tone to minimize heat adsorption and glare. However, lighting for the storage tank sites, if at all, would be limited to a minimal amount of security lighting that would not substantially affect views or cause nighttime glare for any residential areas or roadways. Therefore, there would be **no impact**.

3.2 AGRICULTURE AND FOREST RESOURCES

	Would the project…	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant Impact	No Impact
a)	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☑
b)	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☑
c)	Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)) or timberland (as defined in Public Resources Code section 4526)?	☐	☐	☐	☑
d)	Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☑

e)	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use??	☐	☐	☐	☑

3.2.1 Setting

The recycled water pipeline routes for the Proposed Project are located in existing urbanized areas. The alternative storage tank sites at the RRPS site are currently vacant and open areas with annual grassland vegetation and surrounded by residential areas, and no agricultural lands. The alternative storage tank locations at the WWTP site also are open annual grassland areas, with agricultural lands located immediately east of the sites. No agricultural lands or forests are located at any of the sites where the Proposed Project would be constructed.

3.2.2 Discussion

a-e) The Proposed Project would involve temporary construction activities only in urbanized areas and no agricultural or forestry lands would be affected. Temporary construction activity at the WWTP would occur within 200 feet of existing agricultural land activities. However, no aspect of construction or operations of the Proposed Project would adversely affect, or directly or indirectly cause or contribute to conversion of agricultural or forestry resources to other land uses. Therefore, there would be **no impact**.

3.3 AIR QUALITY

	Would the project…	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant Impact	No Impact
a)	Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☑	☐
b)	Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☑	☐
c)	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☑	☐
d)	Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☑	☐
e)	Create objectionable odors affecting a substantial number of people?	☐	☐	☑	☐

3.3.1 Setting

The project site is located in Contra Costa County, California, which is within the San Francisco Bay Area Air Basin (SFBAAB). The SFBAAB also includes all of Alameda, Contra Costa,

Marin, Napa, San Francisco, San Mateo, Santa Clara Counties; the western portion of Solano County and the southern portion of Sonoma County. The ambient concentrations of air pollutant emissions are determined by the amount of emissions released by the sources of air pollutants and the atmosphere's ability to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, atmospheric stability, and sunlight. Therefore, existing air quality conditions in the area are determined by such natural factors as topography, meteorology, and climate, in addition to the amount of emissions released by existing air pollutant sources.

The city of Brentwood is located in the eastern portion of Contra Costa County. The area is generally well ventilated by winds flowing through the Carquinez Straits and Delta. Terrain does not restrict ventilation, but temperatures are quite warm which promotes the formation of ozone (County of Contra Costa 2005: 8-51).

Of the many pollutants, ozone and particulate matter (i.e., respirable [PM10] and fine [PM2.5]) are of primary concern within the County, as well as for much of the rest of the State. Contra Costa County is considered by the State, under the terms of the California Clean Air Act (CCAA), to be "non-attainment" for ozone and both PM10 and PM2.5, and to be either "attainment" or unclassified for other pollutants (California Air Resources Board [ARB] 2014). Additionally, under the terms of the National Ambient Air Quality Standards (NAAQS), the County is categorized as "marginal non-attainment" for the 8-hour ozone standard, "other non-attainment" for the 1-hour ozone standard, "moderate non-attainment" for the PM2.5 standard, and "attainment" for the PM10 standard (U.S. Environmental Protection Agency [USEPA] 2014a).

Criteria air pollutant concentrations are measured at several monitoring stations in the Bay Area Air Quality Management District (BAAQMD). The Bethel Island Rd. station is the closest station to the project site, located approximately three miles northeast of the city of Brentwood, and reports air quality data for ozone and PM10. The next nearest station that reports PM2.5 data is the Concord-2975 Treat Blvd station, located about 16 miles west of the City. In general, the ambient air quality measurements from these stations are representative of the air quality near the project site. **Table 4** summarizes the air quality data for the three most recent calendar years for which data is available.

Although naturally occurring asbestos occurs throughout the State, occurrences within Contra Costa County are located in central and western areas of the County and are not located within Brentwood city limits. Thus, naturally occurring asbestos is unlikely to be found within the project area (Van Gosen and Clinkenbeard 2011).

Regulatory Framework

Air quality within the project area is regulated by such agencies as USEPA and ARB at the federal and state levels, respectively, and locally by the BAAQMD. BAAQMD attains and maintains air quality conditions in the SFBAAB through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality

issues. BAAQMD's clean air strategy includes the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, and issuance of permits for stationary sources of air pollution. BAAQMD also inspects stationary sources of air pollution and responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by the federal Clean Air Act (CAA), the federal Clean Air Act Amendments of 1990 (CAAA), and the CCAA.

Table 4. Summary of Annual Data on Ambient Air Quality (2011-2013)1.

Air Contaminant	2011	2012	2013
Ozone			
Maximum concentration (1-hr/8-hr avg, ppm)	0.091/ 0.078	0.098/ 0.088	0.082/ 0.076
Number of days state standard exceeded (1-hr/8-hr)	0/4	1/4	0/1
Number of days national standard exceeded (8-hr)	0/2	0/2	0/0
Fine Particulate Matter (PM2.5)			
Maximum concentration (24-hour µg/m^3)	47.5	32.2	36.2
Number of days national standard exceeded (24-hour measured[2])	2	0	1
Respirable Particulate Matter (PM10)			
Maximum concentration (24-hour µg/m^3)	59.5	52.3	50.7
Number of days state standard exceeded (measured/calculated[2])	0/0.0	1/6.1	1/*
Number of days national standard exceeded (measured/calculated[2])	0/0.0	0/0.0	0/*

Notes:

1 Measurements from the Bethel Island Rd. Monitoring Station for ozone and respirable particulate matter (PM_{10}). Measurements of fine particulate matter ($PM_{2.5}$) obtained from the Concord-2975 Treat Blvd air monitoring station.

2 Measured days are those days that an actual measurement was greater than the level of the state daily standard or the national daily standard. Measurements are typically collected every six days. Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day. The number of days above the standard is not necessarily the number of violations of the standard for the year.

µg/m3 = micrograms per cubic meter
ppm = parts per million
* = There was insufficient data to determine the value.
Source: ARB 2015

Federal

At the federal level, USEPA implements the national air quality programs. USEPA's air quality mandates are drawn primarily from the CAA, enacted in 1970. The most recent major amendments were made by Congress in 1990. The CAA requires USEPA to establish National Ambient Air Quality Standards (NAAQS). USEPA has established primary and secondary NAAQS for the following criteria air pollutants: ozone, CO, NO2, SO2, PM10, PM2.5, and lead (ARB 2013). The primary standards protect public health and the secondary standards protect public welfare. The CAA also requires each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The federal CAAA added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air

pollution. The SIP is modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. USEPA reviews all state SIPs to determine whether they conform to the mandates of the CAA and its amendments and whether implementing them will achieve air quality goals. If USEPA determines a SIP to be inadequate, a Federal Implementation Plan that imposes additional control measures may be prepared for the nonattainment area. If the state fails to submit an approvable SIP or to implement the plan within the mandated time frame, sanctions may be applied to transportation funding and stationary air pollution sources in the air basins.

State

For state air quality planning purposes, the SFBAAB, including Contra Costa County, is classified as a marginal non-attainment area for the 8-hour ozone standard. Under the CCAA, areas not in compliance with the state standards must submit plans to reduce emissions and achieve attainment. The Bay Area Clean Air Plan (CAP), updated approximately every three years, reflects the progress in meeting the air quality standards and to incorporate new information regarding the feasibility of control measures and new emission inventory data. The latest CAP is the Bay Area 2010 Clean Air Plan. BAAQMD is currently working on updates to the 2015 CAP. The Air District's record of progress in implementing previous measures must also be reviewed. BAAQMD's plan is prepared with the cooperation of the Metropolitan Transportation Commission (MTC), and the Association of Bay Area Governments (ABAG). The CAP serves to:

- update past strategies in accordance with the requirements of the CCAA to implement "all feasible measures" to reduce ozone;
- consider the impacts of ozone control measures on particulate matter, toxic air contaminants (TACs), and greenhouse gases (GHGs) in a single, integrated plan;
- review progress in improving air quality in recent years; and
- establish emission control measures to be adopted or implemented in the near future timeframe.

Local

All projects are subject to BAAQMD's rules and regulations in effect at the time of construction. Specific rules applicable to the construction activities under the alternatives being considered may include, but are not limited to:

- Regulation 2, Rule 1, General Permit Requirements. Includes criteria for issuance or denial of permits, exemptions, appeals against decisions of the Air Pollution Control Officer (APCO) and BAAQMD actions on applications.

- Regulation 5, Open Burning. Generally prohibits open burning, but also allows for exemptions such as agricultural burning, disposal of hazardous materials, fire training, and range, forest, and wildlife management.

- Regulation 6, Rule 1, General Requirements. Limits the quantity of particulate matter in the atmosphere by controlling emission rates, concentration, visible emissions and opacity.

- Regulation 7, Odorous Substances. Establishes general limitation on odorous substances and specific emission limitation on certain odorous compounds.

- Regulation 8, Rule 3, Architectural Coatings. Limits the quantity of volatile organic compounds in architectural coatings supplied, sold, offered for sale, applied, solicited for application, or manufactured for use within BAAQMD.

- Regulation 11, Rule 2, Asbestos Demolition, Renovation, and Manufacturing. Limits asbestos emissions during demolition or renovation of structures and the associated disturbance of asbestos-containing waste material generated or handled during these activities.

Federal General Conformity

Some project-related construction activity would occur in the SFBAAB Federal Ozone and PM2.5 Nonattainment Areas, which includes Contra Costa County under the jurisdiction of the BAAQMD. As mentioned above, the SFBAAB is classified as "marginal non-attainment" for the 8-hour ozone standard, "other non-attainment" for the 1-hour ozone standard, "moderate non-attainment" for the PM2.5 standard under the NAAQS (USEPA 2014a). Section 176(c)(4) of the Clean Air Act prohibits federal entities from taking actions in nonattainment or maintenance areas if those actions do not conform to the applicable SIP for the attainment and maintenance of NAAQS. The project area is in attainment or unclassified with respect to the NAAQS for all other CAPs.

General conformity is the federal regulatory process for preventing major federal actions or projects from interfering with air quality planning goals. Conformity provisions ensure that federal funding and approval are given only to those activities and projects that are consistent with air quality SIPs. Conformity with the SIP means that major federal actions will not cause new air quality violations, worsen existing violations, or delay timely attainment of the NAAQS.

The process for making this determination for non-transportation projects is referred to as a general conformity rule, or general conformity analysis, and is subject to USEPA's General Conformity Regulations (40 CFR 93, Subpart B). The general conformity regulations incorporate a stepwise process, beginning with an applicability analysis. Before any approval is given for a federal action to go forward, the regulating federal agency must apply the applicability requirements found at 40 CFR Section 93.153(b) to the federal action to evaluate whether, on a pollutant-by-pollutant basis, a determination of general conformity is required. The applicability

analysis examines whether the net increase in direct and indirect emissions resulting from a federal action would equal or exceed certain de minimis emission levels.

Because ozone is a secondary pollutant, the applicability analysis is based on primary emission of its precursors, ROG and NOx. If the net emissions levels for either ROG or NOx exceed the de minimis levels for ozone, then the federal action is subject to a general conformity evaluation for ozone. De minimis emissions levels depend on the severity of non-attainment and type of pollutant. De minimis levels applicable to the SFBAAB non-attainment ratings for Ozone precursors and PM2.5 are presented in the list of significance thresholds below.

BAAQMD's CEQA Thresholds of Significance

BAAQMD adopted thresholds of significance for the purposes of CEQA assessments in June 2010 that are currently undergoing legal review, as summarized below.

On March 5, 2012 the Alameda County Superior Court issued a judgment finding that BAAQMD had failed to comply with CEQA when it adopted the thresholds and challenging the notion that CEQA would require analysis of the environment's impact on the project. The court found that the adoption of the thresholds was a project under CEQA and ordered BAAQMD to examine whether the thresholds would have a significant impact on the environment under CEQA before recommending their use. The court issued a writ of mandate ordering BAAQMD to set aside the thresholds and cease dissemination of them until BAAQMD had complied with CEQA.

On August 13, 2013, the Court of Appeals ruled that adoption of environmental thresholds by a public agency following the provisions of CEQA Guidelines Section 15064.7 is not a "project" under CEQA (California Building Industry Association [CBIA] v. BAAQMD). The Appellate Court decision upheld and confirmed the process followed by the BAAQMD to adopt its 2010 significance thresholds for criteria air pollutant emissions, toxic air contaminants (TAC), and GHGs.

On November 26, 2013, continuing litigation on the CBIA v. BAAQMD case, the California Supreme Court voted unanimously to grant a review of the legal issues with respect to whether or not CEQA requires analysis of the impact of the environment on the project. As of January 1, 2015, the California Supreme Court has not yet released their final review or made a decision on this case.

Due to the existing court order on BAAQMD's adopted 2010 CEQA Thresholds of Significance, BAAQMD has not recommended specific thresholds of significance for use by local governments at this time. BAAQMD states that lead agencies will need to determine appropriate air quality thresholds to use for each project they review based on substantial evidence that they should include in the administrative record for the project. One resource BAAQMD provides as a reference for determining appropriate thresholds is the CEQA Thresholds Options and Justification Report developed by staff in 2009 [Bay Area Air Quality Management District

(BAAQMD) 2009]. The CEQA Thresholds Options and Justification Report outlines substantial evidence supporting a variety of thresholds of significance.

For the purpose of this analysis, the following thresholds of significance were used to determine if an impact on air quality would be significant. The project would result in a significant air quality impact if it would:

- cause daily short-term construction-generated criteria air pollutant or precursor emissions to exceed average emissions of 54 pound per day (lb/day)for reactive organic gases (ROG), 54 lb/day for oxides of nitrogen (NOX), 82 lb/day of PM10 exhaust, or 54 lb/day of PM2.5 exhaust, or substantially contribute to emissions concentrations (e.g., PM10) that exceed the NAAQS or CAAQS;

- cause daily long-term regional (i.e., operational) criteria air pollutant or precursor emissions to exceed average emissions of 54 lb/day for ROG and 54 lb/day for NOX, 82 lb/day of PM10 exhaust, or 54 lb/day of PM2.5 exhaust, or substantially contribute to emissions concentrations (e.g., PM10) that exceed the NAAQS or CAAQS;

- not comply with BAAQMD's Best Management Practices for dust emissions (e.g., PM10 and PM2.5);

- result in long-term operational local mobile-source carbon monoxide (CO) emissions that would violate or contribute substantially to concentrations that exceed the California 1-hour ambient air-quality standard of 20 ppm or the 8-hour standard of 9 ppm;

- generate TAC emissions that would expose sensitive receptors to an incremental increase in cancer risk that exceeds 10 in one million and/or a hazard index of 1;

- locate sensitive receptors where they would be exposed to a combined level of cancer risk from nearby sources of TACs that exceeds 100 in one million and/or a combined hazard index of 10. This threshold is consistent with the cumulative health risk threshold included in BAAQMDs CEQA Thresholds Options and Justification Report (BAAQMD 2009:5) as well as the prioritization scores BAAQMD uses to implement the Hot Spots Information and Assessment Act (ARB 2008, 2011);

- create objectionable odors affecting a substantial number of people (e.g., five confirmed complaints per year averaged over three years); or

- result in cumulative annual emissions that would exceed the federal de minimis levels of 50 tons of ROG per year, 100 tons of NOx per year, or 100 tons of PM2.5 per year (USEPA 2014b).

BAAQMD advises that for construction projects that are less than one year in duration, average daily emissions should be calculated by annualizing impacts over the scope of actual days of construction rather than the full year (BAAQMD 2010, 2012).

Methods

Construction and operational emissions were calculated using a combination of model and off-model methods along with the assumptions dictated in the project description. Per BAAQMD recommendations on linear construction projects, emissions from pipeline construction and related paving activities were estimated using the Sacramento Rd. Construction Emissions Model (RCEM) (Version 7.1.5.1) (BAAQMD 2012: B-12). For the non-linear aspects of the project, emissions from water storage tank construction were estimated with the CalEEMod (Version 2013.2.2) computer program, also recommended by BAAQMD (BAAQMD 2013). Both models use emissions factors from ARB's OFFROAD database. However, due to possible differences in model assumptions apart from off-road equipment emissions, all emissions associated with material hauling and worker commute were estimated using the RCEM to maintain consistency in the emission calculations. Construction emissions related to the installation of the two 50 hp pumps at the existing WWTP were assumed to be minimal and were not estimated. In accordance with BAAQMD-recommended methodologies, emissions generated by the project are modeled and presented on a pound-per-day and a tons-per-year basis with respect to the metrics in the selected thresholds of significance. Assumptions and data used for the model inputs were based on information Section 2 ("Project Description") and details described in **Appendix A**.

Short-Term Construction

Construction-related emissions are described as "short term" or temporary in duration but have the potential to represent a significant impact with respect to air quality. Construction-related activities would result in emissions of criteria air pollutants (e.g., PM10 and PM2.5) and precursors (e.g., ROG and NOX). Emissions of NOX would be primarily associated with off-road (e.g., gas and diesel) construction equipment exhaust; secondary sources would include on-road trucks for import and export of materials and worker vehicles for commuting. Worker commute trips in gasoline-fueled vehicles, off-gassing from asphalt application, and application of architectural coatings would be the principal sources of ROG, with additional ROG coming from off- and on-road construction equipment.

Emissions of fugitive PM or dust (PM10 and PM2.5) are associated primarily with ground-disturbance activities during site preparation, trenching, and grading, and may vary as a function of such parameters as soil silt content, soil moisture, wind speed, acreage of disturbance area, and VMT onsite and offsite. Exhaust emissions from diesel equipment and worker commute trips also contribute to short-term increases in PM10 and PM2.5 emissions, but to a much lesser extent.

Construction activities would consist of grading, excavation, pipeline installation, building construction, paving, and architectural coating. The proposed project would involve the installation of 17,143 feet of pipeline, and assumed to involve no more than 300 feet of pipeline constructed in any given day with an average pipeline area of disturbance of approximately 900 square feet (300 feet by 3 feet). The two storage tank sites were assumed to have a maximum building footprint 1 acre at each site. A total of 8,887 cubic yards (CY) of fill, tank concrete, and

paving material are anticipated to be imported for the pipeline construction activities. 306 tons of new piping material, 211 tons of tank steel panel, and 68 tons of tank rebar are also estimated to be imported to the project sites. 9,525 CY of excavated soil are estimated to be off-hauled to construction disposal locations. One-way haul truck travel distances are assumed to be 30 miles for pipe and steel materials and 15 miles for imported fill, concrete, asphalt, and exported excavated material. Truck capacities are assumed to be 20 CY for soil, 11 CY for paving materials, 7 CY for concrete, and 50,000 lbs for steel and pipeline transport per truck trip.

As applicable, default model assumptions were used when determining the construction phases, the duration of each construction phase, and the allocation of construction equipment to each construction phase. Construction could begin in 2015 and is estimated to take between 8 and 12 months to complete. Any model default equipment not listed in Table 3 were removed from the model calculations. Similarly, any equipment listed in Table 3 that were not included in model defaults, such as tunnel boring equipment, were included in the appropriate construction phase. Because the selected emissions thresholds are measured in average pounds of emissions per day, total construction emissions from pipeline construction, paving, and storage tank construction were summed and divided across the number of working days. As a conservative estimate, the minimum number of working days (8 months at five days a week or approximately 170 days excluding holidays and weekends) and 10 hour working days were assumed. There would be an average of 10 construction workers required per day commuting an average of 20 miles one-way. Additionally, it was assumed that a maximum of 7 pieces of large equipment would be operated in any given construction day and that the pipeline and storage tank construction activities may occur simultaneously.

Long-Term Operations

With respect to operational impacts, the project description states that implementation would result in a savings of 120,000 kWh per year due to offset electricity demand on pumps for potable water and would not result in any adverse impacts on the project area. These savings would result in reductions in offsite emissions at upstream power generation facilities discussed further under the Greenhouse Gas section. Additionally, it was assumed that no additional staff would be added to the existing staff under Proposed Project conditions.

3.3.2 Discussion

a) The emission inventories used to develop a region's air quality attainment plans are based primarily on projected population growth and vehicle miles traveled (VMT) for the region, which are based, in part, on the planned growth identified in regional and community plans. Therefore, projects that would result in increases in population or employment growth beyond that projected in regional or community plans could result in increases in VMT above that planned in the attainment plan, further resulting in mobile source emissions that could conflict with a region's air quality planning efforts. Increases in VMT beyond that projected in area plans generally would be considered to have a significant adverse incremental effect on the region's ability to attain or maintain state and federal ambient air quality standards.

The proposed project consists of two separate land use types: roadway and industrial. At project completion the majority of pipelines would be located beneath roadways and have no impact on land uses. The storage tanks would be located on areas zoned for public facilities. Although up to 20 construction workers per day may be required during construction, no new employees would be anticipated once construction is complete. The project would not result in any regional population growth beyond what is planned. Thus, implementation of the proposed project would not conflict with or obstruct implementation of any air quality planning efforts. As a result, this impact would be **less-than-significant**.

b) The proposed project would result in emissions of criteria air pollutants and precursors, including ROG, NOX, PM10, and PM2.5 associated with construction (short-term), but not under operation (long term). Emissions of criteria air pollutants and precursors associated with the project were calculated using applicable portions of the RCEM and CalEEMod, as described above and in Appendix A. RCEM and CalEEMod allows for the input of project-specific information to estimate emissions generated by the use of onsite heavy equipment (e.g., pavers, excavators) from fugitive dust and exhaust emissions, worker commute trips, and haul truck trips. Input parameters were based on project-specific information, default model settings, and reasonably conservative assumptions. Emissions from short-term construction and a brief explanation of the long-term air quality impacts are described separately below.

Short-Term Construction-Related Regional Criteria Air Pollutant and Precursor Emissions

Table 5 summarizes the modeled construction-related emissions of criteria air pollutants and ozone precursors for the proposed project. The significance of construction-related air quality impacts was determined by comparing these modeling results with applicable significance thresholds. Refer to Appendix A for detailed modeling input parameters and results.

Based on the modeling conducted, construction of the proposed project would result in average daily emissions of approximately 9 lb/day of ROG, 54 lb/day of NOX, 5 lb/day of PM10 and 4 lb/day of PM2.5 in 2015. Additionally, ROG, NOX, and PM2.5 emissions would be less than 50 tons per year for each pollutant. Of these emissions results, no construction emissions would be expected to exceed either the BAAQMD thresholds or the applicable federal de minimis levels. In addition, because the average daily emissions were estimated using a conservative assumption of a shorter than anticipated construction duration, total construction emissions extended over a longer construction period of more than 8 months would likely yield lower average emissions per day. Thus, emissions could be even lower than those modeled as construction activity may last up to 12 months.

Table 5. Summary of Modeled Emissions of Criteria Air Pollutants and Precursors Associated with Project Construction Activities for an 8-Month Construction Period.

	ROG	NO_X	PM_{10} (exhaust)	PM_{10} (dust)	$PM_{2.5}$ (exhaust)	$PM_{2.5}$ (dust)
Pipeline and Pavement Construction[1] (tons/year)	0.3	2.5	0.2	0.1	0.1	0.0
Storage Tank Construction[2] (tons/year)	0.5	2.1	0.2	0.0	0.2	0.0
Project total emissions (tons/year)	0.8	4.5	0.3	0.1	0.3	0.0
Average Daily Emissions[3] (lbs/day)	8.9	53.5	3.7	0.9	3.5	0.2
BAAQMD Thresholds of Significance (Average lbs/day)	54	54	82	BMPs/ AAQS	54	BMBs/ AAQS
Exceeds Thresholds?	No	No	No	NA	No	NA
Federal de minimis Thresholds (tons/year)	50	100	NA	NA	100	
Exceeds Federal de minimis Thresholds?	No	No	NA	NA	No	

Notes:

1 Modeled using the Sacramento Rd. Construction Emissions Model. Includes worker commute and hauling emissions from both pipeline and storage tank construction. Emissions differ between assumed construction periods due to fixed number of workers allowed per day.

2 Modeled using CalEEMod. Does not include worker or hauling emissions calculations to avoid double counting.

3 Average daily emissions of criteria air pollutants were calculated based on total project emissions divided by the number of construction work days (170 days was assumed for a construction period of 8 months).

AAQS = Ambient Air Quality Standards
BAAQMD = Bay Area Air Quality Management District
BMPs = Best Management Practices
lb/day = pounds per day
NA = not applicable
NO_X = oxides of nitrogen
PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less
$PM_{2.5}$ = respirable particulate matter with an aerodynamic diameter of 2.5 micrometers or less
ROG = reactive organic gases

Modeled values represent average daily emissions that would occur over the duration of the construction period. See Appendix A for detail on model inputs, assumptions, and project specific modeling parameters.
Source: Modeling conducted by Ascent Environmental in 2014, BAAQMD 2010, USEPA 2014b.

The estimated emissions levels would not exceed the thresholds of significance or the federal de minimis levels in regards to General Conformity Rule applicability (e.g., project would not conflict with implementation of the CAA). Consequently, the project would not result in short-term construction-related emissions that violate any air quality standard or contribute substantially to an existing or projected air quality violation. Therefore, this impact is considered **less than significant**.

Long-Term Operational-Related Regional Criteria Air Pollutant and Precursor Emissions

As previously mentioned, no new local criteria pollutant emissions sources are anticipated under long-term project operation. No additional workers would be added for the operation of the additional storage tanks and pumps. All pumps would be electrically operated, although some pumps would be fitted with diesel back-up generators. The operation of the

diesel back-up generators are assumed to be used only under emergency conditions and its average daily effects over the project lifetime are considered minimal with respect to the BAAQMD thresholds. Additionally, BAAQMD allows the use of emergency generators contingent on approved permits (BAAQMD 2014). Therefore, no additional emissions are anticipated under long-term operation of the projects, resulting in no exceedance of selected thresholds or federal de minimis levels in regards to General Conformity Rule applicability (e.g., project would not conflict with implementation of the CAA). Thus, this impact is considered **less than significant**.

c) The Contra Costa County portion of the SFBAAB is currently designated as a nonattainment area for the federal and State ambient air quality standards for ozone and PM2.5 and for the State standards for PM10. Past, present, and future development projects contribute to the region's adverse air quality impacts on a cumulative basis. By its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size to, by itself, result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts.

In developing thresholds of significance for air pollutants, BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions.

As discussed in the analysis under item b) above, project-generated emissions would not exceed applicable BAAQMD thresholds or the federal de minimis levels and; therefore, would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under the CAAQS or NAAQS. As a result, project-generated emissions of criteria air pollutants and precursors would not be cumulatively considerable. Therefore, this impact would be **less than significant**.

d) The potential for the Proposed Project to result in the exposure of sensitive receptors to substantial pollutant concentrations was evaluated for construction-related activities and long-term operations-related effects, as follows.

Short-Term Construction

During construction, various residences and other sensitive receptors may be affected by the temporary construction emissions resulting from the pipeline installation and storage tank construction. The pipeline installation and pavement activities would occur along roadways and may occur directly adjacent to residences, medical facilities, schools, childcare facilities, and places of worship, where sensitive receptors are known to be present. However, per the project description, construction activities would occur for approximately 3 days per 300 foot segment, assuming the shorter 8 month construction schedule. With respect to the construction of the storage tanks, no sensitive receptors are located within

1,000 feet of the Brentwood WWTP storage tank. However, several single family home residences are located within 200 feet of the Roddy Ranch Pump Station storage tank location, with the closest home located approximately 50 feet north of either of the propose water tank locations at the RRPS location.

Construction-related activities would result in temporary, short-term project-generated emissions of diesel PM from the exhaust of off-road, heavy-duty diesel equipment for site preparation (e.g., grading, excavating); paving; application of architectural coatings; and other miscellaneous activities. Particulate exhaust emissions from diesel-fueled engines (i.e., diesel PM) was identified as a TAC by the ARB in 1998. The potential cancer risk from the inhalation of diesel PM, as discussed below, outweighs the potential for all other health impacts (ARB 2003), so diesel PM is the focus of this discussion. Based on the emission modeling conducted and presented in Appendix A, maximum daily emissions of PM2.5, considered a surrogate for diesel PM, would not exceed 2.6 lb /day at either the storage tank or pipeline construction locations and; therefore, would be less than BAAQMD's threshold of 54 lb/day.

Additionally, the dose to which receptors are exposed is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for any exposed receptor. Thus, the risks estimated for an exposed individual are higher if a fixed exposure occurs over a longer period of time. According to OEHHA, HRAs, which determine the exposure of sensitive receptors to TAC emissions, should be based on a 30-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the proposed project (Office of Environmental Health Hazard Assessment 2012:11-3). Consequently, it is important to consider that the use of off-road heavy-duty diesel equipment would be limited to the construction period, which would be at most 12 months (less for the more equipment-intensive phases). Also, studies show that diesel PM is highly dispersive (e.g., decrease of 70% at 500 feet from the source) (Zhu et al. 2002).

Therefore, considering the highly dispersive properties of diesel PM, the relatively low mass of diesel PM emissions that would be generated during project construction, and the relatively short duration of construction activities, construction-related TAC emissions would not expose sensitive receptors to an incremental increase in cancer risk that exceeds 10 in one million or a hazard index greater than 1.0. As a result, the project would not exceed BAAQMD thresholds for risks and hazards to receptors associated with new emissions sources. Additionally, the project would not exceed applicable BAAQMD or federal de minimis thresholds with respect to short term construction emissions, as discussed under b). Thus, the project would not expose sensitive receptors to substantial pollutant concentrations during construction. This impact would be **less than significant**.

Long-Term Operations

As discussed under b), the project would not have significant long-term operation emissions due to the operation of electrically powered pumps with emergency usage of diesel powered back-up generators. No additional emissions from long-term traffic impacts would occur due to forecasted changes in vehicle trips for workers. Therefore, no new operational-related TAC emissions would occur and the project's operation would not expose sensitive receptors to an incremental increase in cancer risk that exceeds 10 in one million or a hazard index greater than 1.0. As a result, the project would not exceed BAAQMD thresholds for risks and hazards to receptors associated with new emissions sources. Additionally, the project would not exceed applicable BAAQMD and federal de minimis thresholds with respect to long-term operational emissions, as discussed under b). Thus, the project would not expose sensitive receptors to substantial pollutant concentrations during operation. This impact would be **less than significant**.

e) The occurrence and severity of odor impacts depend on numerous factors, including the nature, frequency, and intensity of the source; wind speed and direction; and the presence of sensitive receptors. Although offensive odors rarely cause physical harm, they may still be very unpleasant, leading to considerable distress and often generating citizen complaints to local governments and regulatory agencies.

Operation of the new pipeline and water storage tanks would not introduce new, permanent odor-generating facilities, nor would it place receptors substantially closer to existing sources of odors. Thus, development of the proposed project would not expose the nearby existing receptors to objectionable odors.

Construction associated with the project would result in odors from exhaust emissions from onsite diesel equipment, asphalt paving, and painting. Such emissions would be intermittent in nature and would dissipate rapidly with increasing distance from the source.

Implementation of the project would not involve the construction or operation of any major odor sources. Thus, the proposed project would not be anticipated to result in the exposure of sensitive receptors to objectionable odors. As a result, this impact would be **less than significant.**

3.4 BIOLOGICAL RESOURCES

Would the project…	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☑	☐	☐

b)	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☑	☐	☐
c)	Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☑	☐
d)	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☑	☐
e)	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☑
f)	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☑

3.4.1 Setting

This section summarizes the methods and results of the literature review and reconnaissance-field surveys completed to evaluate the potential effects of the Proposed Project to biological resources consisting of plant, wildlife, and fisheries resources, and their habitat. The Proposed Project is located in Eastern Contra Costa County, primarily within the city of Brentwood, at elevations ranging approximately 0-100 feet above mean sea level. The area includes diverse land uses including the urbanized areas within the City's boundaries and north to Oakley, agricultural land areas of the Sacramento River-San Joaquin River Delta (Delta) located generally south and east of the City, and the undeveloped foothills of Diablo Mountain Range to the west of the City.

Methods

For the purposes of this document, a special-status plant species is defined as any species that is granted status by a federal, state, or local agency. Federally listed species are defined as those species granted status by the U.S. Fish and Wildlife Service (USFWS) under the federal Endangered Species Act (ESA) and include threatened (FT), endangered (FE), proposed threatened or endangered (FPT, FPE), candidate (FC), or listed species proposed for delisting (FPD). State of California listed plant species, which are granted status by California Department of Fish and Wildlife (CDFW) under the California Endangered Species Act (CESA), include rare (SR), threatened (ST), or endangered (SE) species. Under CEQA, special-status plants include species listed by the California Native Plant Society (CNPS) as rare, threatened, or endangered in California (CNPS Lists 1B and 2) (CNPS 2014).

A special-status fish or wildlife species is defined in this document as any species that is granted status by USFWS, National Oceanic and Atmospheric Administration (NOAA) National Marine

Fisheries Service (NOAA Fisheries), and CDFW. Federally listed species are those granted status by federal agencies as FT, FE, FPT, FPE, FC, or FPD. Also included are those species listed by USFWS as Birds of Conservation Concern (BCC) which include "species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under ESA of 1973" (USFWS 2008). State of California listed fish wildlife species are defined as those species granted status as ST, SE, California Fully Protected species (CFP), and California Species of Special Concern (CSC).

Existing Conditions for Terrestrial Vegetation and Wildlife

A literature review and reconnaissance-level terrestrial field surveys were completed to determine the potential for presence of special-status plant and wildlife species or their habitat in the project area. Existing documents pertinent to biological resources in the vicinity of the Proposed Project were reviewed and analyzed, as applicable, including the following sources:

- CDFW's California Natural Diversity Database (CNDDB) (CDFW 2014);
- USFWS Species List (USFWS 2014);
- CNPS Electronic Inventory of Rare and Endangered Plants of California (CNPS 2014);
- United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS 2014); and
- East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan (ECCCHCP) (Jones and Stokes 2006).

Reconnaissance surveys were conducted November 5, 2014. Vegetation communities were assessed in the field based on observed plant species composition. Vegetation communities were classified based on *A Manual of California Vegetation* (Sawyer et al. 2011) and cross-referenced with wildlife habitat types as classified in California Statewide Wildlife Habitat Relationships System (Mayer and Laudenslayer 1988). Wetland delineation field surveys were not conducted for the Project area. However, the locations of areas that may represent sensitive natural communities in and surrounding the Project area were noted during reconnaissance surveys. Sensitive natural communities, as defined by CDFW, include areas of high ecological importance due to being considered rare within the region, likely to support sensitive plants or animals, or provide connectivity between other sensitive habitats, and include wetlands and riparian areas within the project area. **Figure 8** shows a map of the locations of known special-status plant populations and wildlife occurrences in the project area based on the database records.

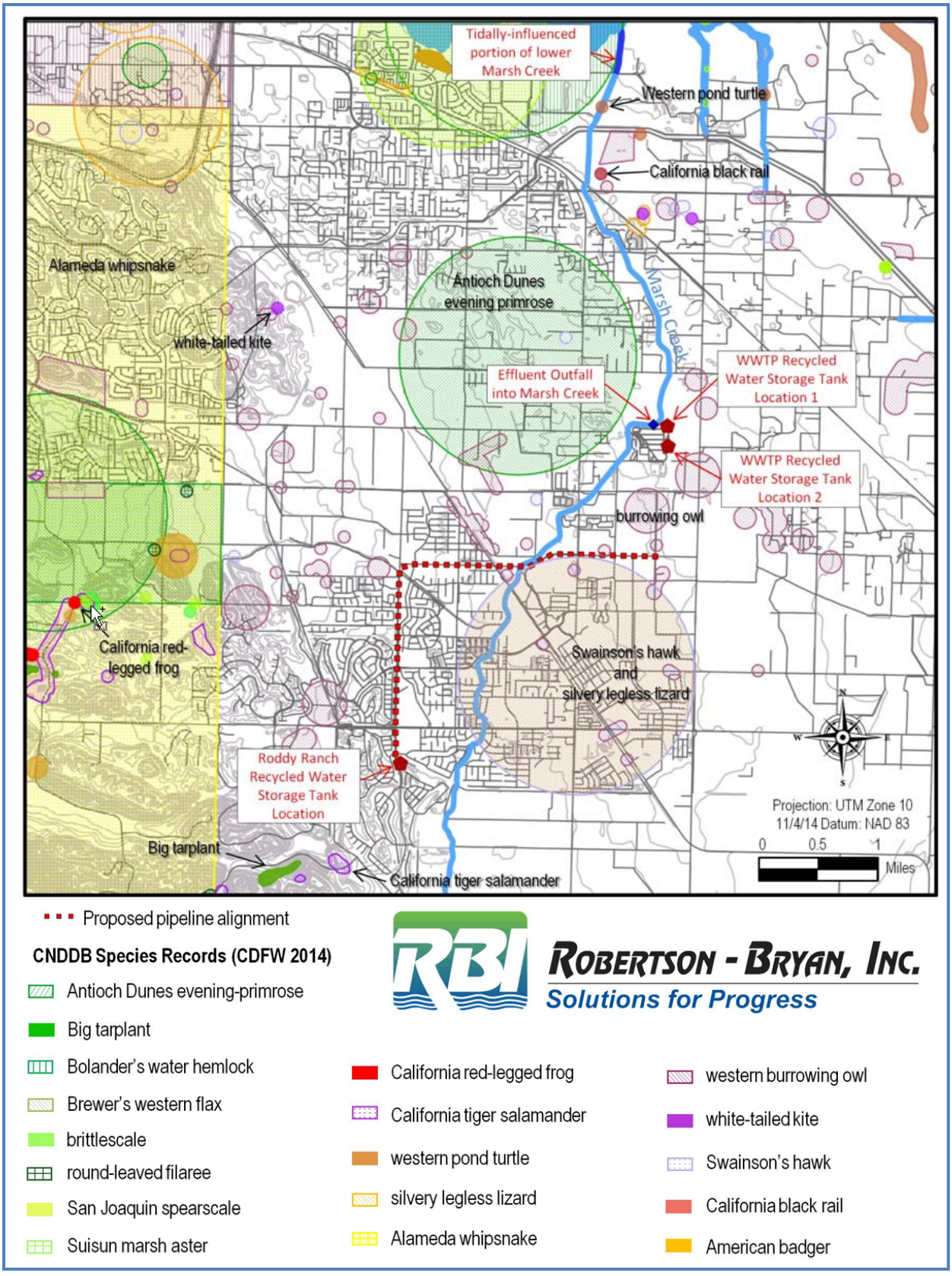

Figure 8. Special-Status Plant and Wildlife Records in the Project Area.

The results of the reconnaissance surveys and literature review are summarized in **Appendix C**, as follows:

- Table C-1 (Project Site Descriptions)
- Table C-2 (Vegetation Communities/Wildlife Habitats)
- Table C-3 (Special-Status Plants)
- Table C-4 (Special-Status Wildlife).

Existing Conditions for Fisheries Resources

Affected Area

Cain et al. (2003) described Marsh Creek as having three distinct zones, based on elevation: (1) the upper zone from the headwaters at approximately 2,000 ft above mean sea level (msl) to approximately 1,000 ft msl, (2) the intermediate zone from 1,000 ft msl to Marsh Creek Reservoir, the impoundment created by Marsh Creek Dam at river mile (RM) 10; and (3) the lower zone, which includes the 10-mile reach extending from Marsh Creek Dam downstream to Marsh Creek's terminus at Big Break in the Delta. The WWTP discharges treated effluent to the lower zone of Marsh Creek at approximately RM 3.5 (i.e., 3.5 miles upstream of Big Break). As such, changes in effluent discharge rates under the Proposed Project would directly affect flows and aquatic habitat within the lower zone of Marsh Creek downstream of the Brentwood WWTP outfall. Based on the de minimis contribution of Marsh Creek flows to Big Break, the relatively small seasonal decrease in effluent discharges under the Proposed Project would not have any measurable effects on aquatic habitat in Big Break or the Delta. Because the Proposed Project would have seasonal effects on flows in the lower 3.5 miles of Marsh Creek, it could indirectly affect fish access to the eight-mile reach of the lower zone that lies upstream of the WWTP outfall (i.e., between the outfall and Marsh Creek Dam). Marsh Creek Dam, which was constructed in 1963 and forms a complete barrier to fish migration, prevents fish from accessing the intermediate and upper zones upstream of the dam. Consequently, the Proposed Project would have no effect on aquatic life or aquatic habitats in the intermediate or upper zones of Marsh Creek. In summary, the Proposed Project could have direct seasonal effects on aquatic habitat in the 3-mile reach between the WWTP outfall and Big Break, which could indirectly affect the ability of migratory fish to access aquatic habitats upstream of the WWTP outfall.

The lower zone of Marsh Creek is characterized as a heavily altered corridor that is channelized and contained by levees for flood control purposes downstream of the City boundaries. Levine and Stewart (2004) examined substrate composition, water depth and velocity, channel morphology, and overhead cover in the lower zone and concluded that the 1.2-mile reach immediately downstream of Marsh Creek Dam provided "satisfactory habitat" for spawning and rearing of fall-run Chinook salmon (*Oncorhynchus tshawytscha*). Access to this habitat by anadromous salmonids was historically prevented, except under flood conditions, by a 6-foot-high grade control (drop) structure that was built in the 1960s approximately 1,000 ft upstream of the WWTP outfall. In 2010, a fish ladder was constructed at this structure by the Natural

Heritage Institute, American Rivers, Friends of the Marsh Creek Watershed, Contra Costa Flood Control District, and a consortium of local and State agencies to facilitate passage of fish to habitats upstream of the grade control structure under wet-weather flow conditions.

A three-mile reach of channelized stream encompassed by levees characterizes Marsh Creek downstream of the grade control structure and WWTP. Instream channel habitat in the three-mile reach extending from the grade control structure (RM 4) to Cypress Rd. (RM 1) consists of engineered rock weirs constructed approximately every 200 ft with pool or glide habitats between each rock weir. Instream channel in the lowest one-mile reach downstream of Cypress Rd. consist primarily of shallow run-type habitats with infrequent shallow pool habitats. Aquatic habitat quantity (i.e., depth and width) in the vicinity of Big Break is influenced by tidal cycles, particularly in the 2,000-ft reach extending from the footbridge over Marsh Creek to the terminus at Big Break. The stream channel throughout the lower three-mile reach of Marsh Creek is largely devoid of overhead and instream cover as most large vegetation has been removed to facilitate water conveyance (Jones & Stokes 2006). Streambed substrate is comprised primarily of fine sediments (i.e., sand, clay, and silt) with localized accumulations of riprap. Streambanks are dominated by grasses and localized areas that are reinforced by riprap (e.g., road crossings, return drains). Bulrushes (*Scirpus spp*.) marsh primrose (*Ludwigia spp.*), and the invasive Brazilian waterweed (*Egeria densa*) are the most common type of emergent vegetation. Under base flow conditions, water depths in the lower three-mile reach range from approximately 1 to 4 feet (Jones & Stokes 2006).

Fish Community

Marsh Creek supports a number of California native and introduced fish species downstream of Marsh Creek Dam (RM 11) shown in **Table 6** (Cain et al. 2003; Leidy 2007). Resident fish species occurring year-round in lower Marsh Creek include native and introduced warmwater fish species, including minnows in the Family Cyprinidae (California roach, common carp, hitch, and Sacramento pikeminnow), introduced Centrarchidae (bluegill, green sunfish, and largemouth bass), native threeespine stickleback, introduced western mosquitofish, and native Sacramento suckers. Central Valley Evolutionarily Significant Unit (ESU) fall-run Chinook salmon occur seasonally in lower Marsh Creek in most years.

Special-status Fish

Adult and juvenile fall-run Chinook salmon (*Oncorhynchus tshawytscha*), a federal Species of Concern and California Species of Special Concern, have been observed regularly in lower Marsh Creek downstream of the grade control structure near the Brentwood WWTP during the fall and winter months in recent years. Adult fall-run Chinook salmon have also been observed during the fall spawning period in the lower zone of Marsh Creek upstream of the grade control structure since construction of the fish ladder in 2010. Juvenile Chinook salmon have been collected in lower Marsh Creek (i.e., downstream of the grade control structure) on at least two separate occasions prior to construction of the fish ladder. In 1995, five juvenile Chinook salmon measuring between 60 and 80 millimeters (mm) were collected by Dr. Darrell Slotton of University of California, Davis, during fish collection efforts implemented under the Marsh

Table 6. Fish Species Occurring in Marsh Creek Downstream of the Marsh Creek Dam.

Common Name	Scientific Name	Native / Introduced [1]	Endangered Species Act Status [2]	
			Federal	State
Central Valley Fall-run Chinook salmon	*Oncorhynchus tshawytscha*	Native	SC	SSC
California roach	*Hesperoleucus symmetricus*	Native	--	--
Common carp	*Cyprinus carpio*	Introduced	--	--
Hitch	*Lavinia exilicauda*	Native	--	--
Sacramento pikeminnow	*Ptychocheilus grandis*	Native	--	--
Bluegill	*Lepomis macrochirus*	Introduced	--	--
Green sunfish	*Lepomis cyanellus*	Introduced	--	--
Largemouth bass	*Micropterus salmoides*	Introduced	--	--
Threespine stickleback	*Gasterosteus aculeatus*	Native	--	--
Western mosquitofish	*Gambusia affinis*	Introduced	--	--
Sacramento sucker	*Catostomus occidentalis*	Native	--	--

[1] Indicates whether the species is native or introduced into California water bodies.
[2] SC: Species of Concern (federal); SSC: Species of Special Concern (State); "--": no special-status designation.

Creek Watershed Mercury Assessment Project (Cain et al. 2003). In March 2002, 13 juvenile Chinook salmon measuring between 40 and 60 mm were collected in lower Marsh Creek during seining efforts conducted by the California Department of Fish and Wildlife (Jones & Stokes 2003). Based on their life history, adult fall-run Chinook salmon have the potential to occur in lower Marsh Creek from October through December. Should adult spawning successfully occur in suitable habitats upstream of the fish ladder, post-emergent fry may be carried downstream to Big Break under high winter (i.e., December-March) flow events and smolts may move downstream to Big Break beginning in January until Marsh Creek temperatures begin to approach their thermal tolerance in late March or April.

Although there are no documented observations of Sacramento splittail (*Pogonichthys macrolepidotus*) or delta smelt (*Hypomesus transpacificus*) in Marsh Creek, these fish species may occur seasonally in the tidal waters of the Delta at Big Break (i.e., at the terminus of Marsh Creek). Consequently, there is a potential for these special-status fish species to make seasonal opportunistic use of the lower, tidally influenced (i.e., the lower one-mile) reach of Marsh Creek in some years (RBI 2010).

Sacramento splittail is a California Species of Special Concern. This small minnow was previously listed as threatened under the federal ESA, but was removed from the list of endangered and threatened species by the USFWS on September 22, 2003. On October 7, 2010, the USFWS published a 12-month finding (50 CFR Part 17), which concluded that the best available information indicated that there is no evidence of decline in abundance of Sacramento splittail and that there were no threats to Sacramento splittail sufficient for warranting listing

under the ESA. The range of this species includes open water of the Delta, Suisun Bay, Suisun Marsh, lower Napa River, lower Petaluma River, and other areas of the San Francisco Estuary (Moyle 2002), except during their spawning period. Sacramento splittail spawn in the spring months, primarily in March and April, on floodplain habitats (USFWS 2010). Although Sacramento splittail may occur seasonally in Big Break, there are no records of this species occurring in Marsh Creek. Because there are no floodplain spawning habitats in lower Marsh Creek, Sacramento splittail are not expected to spawn in Marsh Creek. However, they may make opportunistic use (e.g., for feeding, thermal refugia) of the tidally influenced reach of Marsh Creek within one mile of Big Break.

Delta smelt are listed as threatened under the ESA and endangered under the CESA. Like Sacramento splittail, this species occurs throughout waters of the Delta and Suisun Bay and may occur seasonally in Big Break and thus may make opportunistic use of the tidally influenced reach of Marsh Creek within one mile of Big Break. However, there are no documented occurrences of delta smelt in Marsh Creek, which lacks suitable habitat for delta smelt spawning or rearing of early life stages. Delta smelt spawn in shallow channels and sloughs of the Delta primarily in March and April, but may occur as late as June where conditions (e.g., water temperature, salinity) are suitable.

Central Valley steelhead (*Oncorhynchus mykiss*), the anadromous form of rainbow trout and a threatened species under the federal ESA, occur seasonally in the lower San Joaquin River during their seasonal immigration and emigration period, but have not been documented in Marsh Creek (Leidy et al. 2005; RBI 2010). In an assessment of the historical and current distribution of steelhead in Contra Costa County, Leidy et al. (2005) concluded that the Marsh Creek Dam blocked passage of steelhead to potentially suitable spawning and over-summer rearing habitats in the headwaters of Marsh Creek. Furthermore, these authors concluded that there was no evidence indicating the historical presence of steelhead in the upper reaches of Marsh Creek. Lower Marsh Creek lacks the perennial coldwater pool habitats required by rearing juvenile steelhead (DWR 2003; Cain et al. 2003; RBI 2010). Consequently, the Proposed Project would not have any adverse effects on Central Valley steelhead.

3.4.2 Discussion

a) Construction activities, ground disturbance, and installation of infrastructure associated with the Proposed Project, as well as operations-related effects from the reduction of effluent discharge into Marsh Creek, could potentially result in adverse effects to special-status plants, wildlife, and fisheries resources as follows.

Construction-Related Effects to Special-Status Plants

There are no records for special-status plants in the project area. However there are several records for special-status plant populations in the vicinity of the City. Appendix C, Table C-2 shows the potentially occurring special-status plant species. Although unlikely due to the history of disturbance in the project area, annual grassland and coastal scrub habitat in the proposed recycled water storage tank sites and annual grasslands along the

proposed pipeline alignment represent potential habitat for special-status plant species including, but not limited to large flowered fiddleneck (*Amsinckia grandiflora*), big tarplant (*Blepharizonia plumosa*), and diamond-petaled poppy (*Eschscholzia rhombipetala*). Construction-related activities including ground disturbance (e.g., grading and excavation), material staging and vehicular traffic, and general facility construction activities at the proposed recycled water storage tank sites and along the pipeline alignment could potentially damage or destroy special-status plants, if populations are present. Direct effects resulting from the Proposed Project including loss or disturbance of special-status plants, or indirect effects including loss or disturbance of habitat, would be considered a potentially significant impact. Implementation of Mitigation Measures BIO-1, BIO-2, and BIO-3 would reduce the impacts to a **less-than-significant** level.

MITIGATION MEASURE BIO-1. GENERAL CONSTRUCTION MEASURES.

All contractors and equipment operators will be made aware of the ecological values of the site, and will be given instructions to comply with all mitigation measures.

Construction activities will be limited to a designated work area (including the work corridor and staging areas). The work area will be clearly identified and will be staked and flagged where necessary prior to initiation of construction activities. This will include flagging of riparian and wetland habitats in the vicinity of work areas to ensure their avoidance and protection.

All construction activities, including site preparation and development, will be restricted to daytime hours between 7 a.m. and 5 p.m. on weekdays and non-holidays unless weekend work is unavoidable.

MITIGATION MEASURE BIO-2. PARTICIPATION IN THE ECCCHCP.

The City will participate in the ECCCHCP for the Proposed Project to mitigate any potential impacts to special-status species covered under the ECCCHCP. This coverage will allow the City to minimize and compensate for potential effects resulting from construction- and operation-related activities associated with the Proposed Project through implementation of all applicable conservation measures and compensation mechanisms of the ECCCHCP.

The City will conduct Planning Surveys, as necessary, according to the species-specific protocols contained in Section 6.3.1 of the ECCCHCP and will complete an Application Form and Planning Survey Report.

To compensate for unavoidable project-related effects the City will pay either the applicable fee or dedication of land in lieu of the fee as described in Chapter 9, Funding, and in Brentwood Ordinance number 850

MITIGATION MEASURE BIO-3. SPECIAL-STATUS PLANTS.

On suitable cover types, the City will conduct special-status plant surveys using approved CDFW/USFWS methods during the appropriate season for identification of covered and no-take plant species under the ECCCHCP, as well as any additional special-status plant species not covered under the ECCCHCP.

If ECCCHCP-covered special-status plant species are found in the construction areas, the City would implement all applicable conditions on covered activities under the ECCCHCP including Conservation Measure 1.11 "Avoid Direct Impacts on Extremely Rare Plants" and Conservation Measure 3.10 "Plant Salvage when Impacts are Unavoidable."

If special-status plant species that are not covered by the ECCCHCP are discovered, mitigation measures to reduce impacts to less-than-significant levels would be developed in consultation with appropriate resource agencies.

Operations-Related Effects to Special-Status Plants

As part of the Proposed Project, effluent discharge into Marsh Creek would be reduced, which could affect emergent wetland habitat along the stream bank. However, special-status plant species are not expected to be present along Marsh Creek below the current effluent discharge due to active vegetation management activities routinely conducted along the stream bank by the Contra Costa County Flood Control and Water Conservation District (CCCFCWCD) as part of the flood control maintenance activities.

The tidally-influenced portion of lower Marsh Creek is less disturbed and has discontinuous riparian shrub and tree cover. While this area may represent potential habitat for some special-status plant species, such as Delta tule pea (*Lathyrus jepsonii spp. Jepsonii*), Mason's lilaeopsis (*Lilaeopsis masonii*), and Suisun marsh aster (*Symphyotrichum lentum*), changes in the flow regime in Marsh Creek are not expected to affect special-status plant species, even if populations are present, for the following reasons. Flows in Marsh Creek during May-September under existing conditions are fairly low, and thus the lower portion of Marsh Creek is tidally dominated to some distance upstream of Big Break. The seasonal reduction in flows in Marsh Creek downstream of the WWTP is not expected to substantially alter water quality or flow conditions in the existing tidal portion of Marsh Creek, nor is the change in flows expected to substantially alter the distance upstream that is influenced by the tides. Thus, habitat and vegetation in the tidally-influence portion of the creek is not expected to be affected by the reduction in flows. Therefore, any operations-related effects to special-status plants as a result of the Proposed Project, if at all, would be **less than significant**.

Construction-Related Effects to Special-Status Amphibian or Reptiles

Annual grassland habitat at the proposed recycled water storage tank sites and along the proposed pipeline alignment represent potential terrestrial habitat for special-status amphibian and reptile species such as California tiger salamander, silvery legless lizard,

western pond turtle (WPT), California horned lizard, giant garter snake (GGS), and San Joaquin whipsnake. Construction-related activities including ground disturbance, material staging and vehicular traffic, and general facility construction activities in these habitats could potentially disturb or harm these individuals or nests, if present. The potential construction-related disturbances are considered a potentially significant impact. Implementation of Mitigation Measures BIO-1 and BIO-2 (described above) and Mitigation Measure BIO-4 would reduce the impact to **less-than-significant** level.

MITIGATION MEASURE BIO-4. SPECIAL-STATUS AMPHIBIANS AND REPTILES.

The City will implement pre-construction surveys, as necessary per the ECCCHCP, for California tiger salamander, silvery legless lizard, western pond turtle, California horned lizard, giant garter snake, and San Joaquin whipsnake in annual grassland habitat at the proposed recycled water storage tank sites and along the proposed pipeline alignment.

Surveys will be implemented in accordance with methods described in Section 6.4.3 of the ECCCHCP.

If any ECCCHCP -covered species are found (California tiger salamander, silvery legless lizard, western pond turtle, and giant garter snake), all applicable avoidance and minimization measures, construction monitoring, conservation measures, and/or mitigation fees of the ECCCHCP will be implemented.

If any special-status species not covered by the ECCCHCP (California horned lizard and San Joaquin whipsnake) are discovered, measures to reduce impacts to less-than-significant levels would be developed in consultation with CDFW.

Construction-Related Effects to Terrestrial Habitat for Amphibians or Reptiles

Annual grassland habitats represent potential foraging and breeding habitat for the special-status amphibian and reptile species. Construction-related effects to these habitats would mostly be temporary. Permanent effects would consist of the construction of the two recycled water storage tanks, with an estimated combined footprint of up to approximately 35,000 square feet or 0.8 acre. Because of the temporary nature of the disturbance and the limited extent of permanent impacts to annual grassland habitat, this impact is considered **less-than-significant** and no mitigation is necessary.

Construction-Related Effects to Aquatic Foraging Habitat for Amphibians or Reptiles

Temporary construction-related soil disturbances and potential runoff of sediment and contaminants to aquatic foraging habitat for the special-status amphibians and reptiles has the potential to cause adverse effects. Implementation of Mitigation Measure HWQ-1 (see Section 2.15, "Hydrology and Water Quality") would require the City, or general contractor, to implement Best Management Practices for stormwater runoff, erosion control, and prevention of offsite sedimentation and contaminant spills. Therefore potential

construction-related effects to aquatic habitat would be **less-than-significant** with implementation of Mitigation Measure HWQ-1.

Operations-Related Effects to Amphibian or Reptiles

Marsh Creek downstream of the WWTP effluent discharge location represents aquatic habitat for the western pond turtle (WPT) and giant garter snake (GGS). The WPT is associated with permanent ponds, lakes, streams, irrigation ditches, or permanent pools along intermittent streams. The seasonal reduction in effluent discharge to Marsh Creek under the Proposed Project, and cessation of average effluent discharges in July and August, would lead to reduced streamflow, water levels, and potential water quality changes in Marsh Creek during the summer months, typically May-September. Flows in Marsh Creek during May-September under existing conditions are fairly low and there would continue to be background streamflow in Marsh Creek from the upper reaches that would remain in Marsh Creek.

Existing vegetation management activities for the Marsh Creek channel for flood control purposes by the CCCFCWCD reduces the quality of WPT habitat by causing disturbance to WPT potentially using this area. The tidally-influenced portion of Marsh Creek would not be affected and would remain available as superior habitat for this species. Additionally, WPT appears to be fairly tolerant of low water quality, although there has been little research on the subject. The absence of literature on documented adverse water quality effects and the presence of apparently healthy western pond turtles in wastewater treatment ponds in the Central Valley (Germano and Bury, 2001), suggest that water quality may not be a key limiting factor for WPT survival.

The GGS inhabits low gradient streams and adjacent uplands in areas with essential habitat components consisting of (1) adequate water during the snake's active period, (early spring through mid-fall) to provide a prey base and cover; (2) emergent, herbaceous wetland vegetation, such as cattails and bulrushes, for escape cover and foraging habitat; (3) upland habitat for basking, cover, and retreat sites; and (4) higher elevation uplands for cover and refuge from flood waters. Portions of lower Marsh Creek below the effluent outfall were modeled as core habitat and movement and foraging habitat in the ECCCHCP. There were no recorded observations of GGS presence in the results of the database search for the project area. The lower streamflow conditions in lower Marsh Creek under the Proposed Project may result in increased additional encroachment and growth of vascular emergent vegetation in the creek channel, and thus provide additional habitat and prey for GGS compared to existing conditions. Based on the available information, the operations-related effects of the Proposed Project to aquatic habitat for the WPT and GGS is considered a **less-than-significant impact** and no mitigation is necessary.

Construction-Related Effects to Nesting or Foraging Birds

Annual grassland habitats in the project area represent potential nesting, burrowing, and foraging habitat for the burrowing owl, as well as foraging habitat for the Swainson’s hawk

and golden eagle. These species are covered under the ECCCHCP. Additional special-status bird species not covered by the ECCCHCP are known to or could potentially forage or nest in annual grassland, coastal scrub, and wetland habitats in the vicinity of the proposed recycled water storage tank sites and proposed pipeline alignment, as well as in ornamental trees and other landscaping along the pipeline alignment. The potential construction-related disturbances are considered a potentially significant impact. Implementation of Mitigation Measures BIO-1 and BIO-2 (described above) and Mitigation Measures BIO-5 and BIO-6 would reduce the impact to **less-than-significant** level.

MITIGATION MEASURE BIO-5. BURROWING OWLS.

The City will implement pre-construction surveys for burrowing owls or burrows at proposed recycled water storage tank sites and in areas with potential habitat along the proposed pipeline alignment in accordance with methods described in Section 6.4.3 of the ECCCHCP.

If the burrowing owls nests or burrows are discovered in the work areas, all applicable avoidance and minimization measures, construction monitoring, conservation measures, and/or mitigation fees for this species in the ECCCHCP will be implemented.

MITIGATION MEASURE BIO-6. OTHER SPECIAL-STATUS BIRDS.

If construction activities are scheduled to occur between February 15 and September 15, preconstruction surveys will be conducted at proposed recycled water storage tank sites and along the proposed pipeline alignment within 30 days prior to any such activities to determine whether any nests are present.

A qualified biologist will search within 1000 feet of sites for raptor nests, and within 250 feet of sites for passerine nests.

Biologists will conduct a visual and aural search of the survey area on foot, using binoculars to scan tree tops for the presence of raptor nests.

If any nests are identified, measures to reduce impacts to less-than-significant levels, such as species-specific buffers, would be developed in consultation with appropriate resource agencies (CDFW and/or USFWS).

Construction-Related Effects to Foraging or Breeding Habitat (Birds)

There would be no tree removal associated with the Proposed Project. Annual grassland habitats represent potential foraging and breeding habitat for several special-status bird species. Construction-related effects to these habitats would mostly be temporary. Permanent effects would consist of the construction of the two recycled water storage tanks, with an estimated combined footprint of up to approximately 35,000 square feet or 0.8 acre. Because of the temporary nature of the disturbance and the limited extent of permanent

effects to annual grassland habitat, this impact is considered **less-than-significant** and no mitigation is necessary.

Construction-Related Effects to Aquatic Foraging Habitat (Birds)

Construction-related activities including ground disturbance (e.g., grading and excavation), material staging and vehicular traffic, and general facility construction activities could potentially result in erosion and sedimentation in the watershed, thereby altering aquatic foraging habitat for special-status birds. Implementation of Mitigation Measure HWQ-1 (see Section 2.15, "Hydrology and Water Quality") would require the City, or general contractor, to implement Best Management Practices for stormwater runoff, erosion control, and prevention of offsite sedimentation and contaminant spills. Therefore, implementation of Mitigation Measure HWQ-1 would reduce the potential construction-related impact to aquatic habitat to a **less-than-significant** level.

Operations-Related Effects to Special-Status Birds

Marsh Creek downstream of the current effluent discharge location contains aquatic and wetland habitat potentially used by special-status birds such as the California black rail, California clapper rail, and yellow-billed cuckoo. The seasonal reduction in effluent discharge associated with the Proposed Project would lead to reduced water levels in Marsh Creek during the irrigation season, typically May-September, which could result in reduced water quality. However, reduced streamflow may result in increased emergent wetland habitat along the stream bank. Additionally, Marsh Creek flows under existing conditions are already fairy low during the irrigation season. Also, habitat along the stream bank below the current effluent discharge is disturbed routinely by vegetation management activities conducted along the stream bank by the CCCFCWCD as part of the flood control maintenance activities. The tidally-influenced portion of Marsh Creek would not be affected and would remain available as superior habitat for these species. Therefore, the operations-related effects of the Proposed Project to special-status birds are considered **less-than-significant** and no mitigation is necessary.

Construction-Related Effects to Special-Status Mammals

Annual grassland habitat in the proposed recycled water storage tank sites and along the proposed pipeline alignment is potential habitat for the American badger. The potential construction-related disturbances are considered a potentially significant impact. Implementation of Mitigation Measures BIO-1 and BIO-2 (described above) and Mitigation Measure BIO-7 would reduce the impact to **less-than-significant** level.

Additionally, open areas over project sites may provide foraging habitats for special-status bats. Therefore, construction activities could potentially result in temporary disturbance to foraging bats. The potential construction-related disturbances are considered a potentially significant impact. The City will implement Mitigation Measure BIO-1 which restricts all project activities to the defined work area and limits construction to daylight hours.

Implementation of this measure would avoid any disturbance to bats, which tend to forage at dusk or dark. Implementation of Mitigation Measure BIO-1 would reduce the construction-related impact to aquatic habitat to a **less-than-significant** level.

MITIGATION MEASURE BIO-7. AMERICAN BADGER.

The City will implement pre-construction surveys for American badgers or burrows at proposed recycled water storage tank sites and in areas with potential habitat along the proposed pipeline alignment in conjunction with burrowing owl surveys.

If any American badgers or burrows are found, measures to reduce impacts to less-than-significant levels would be developed in consultation with CDFW, and/or mitigation fees for this species in the ECCCHCP will be implemented.

Construction-Related Effects to Foraging or Breeding Habitat (Mammals)

Annual grassland habitats represent potential habitat for the American badger and potential foraging habitat for special-status bats. Construction-related effects to these habitats would mostly be temporary. Permanent impacts would consist of the placement of two water storage tanks, with an estimated combined footprint of up to approximately 35,000 square feet or 0.8 acre. Because of the temporary nature of the disturbance and the limited extent of permanent impacts to annual grassland habitat, this impact is considered **less-than-significant** and no mitigation is necessary.

Construction-Related Effects to Aquatic Foraging Habitat (Mammals)

Construction-related activities including ground disturbance (e.g., grading and excavation), material staging and vehicular traffic, and general facility construction activities could potentially result in erosion and sedimentation in the watershed, thereby altering aquatic foraging habitat for special-status mammals. Implementation of Mitigation Measure HWQ-1 (see Section 2.15, "Hydrology and Water Quality") would require the City, or general contractor, to implement Best Management Practices for stormwater runoff, erosion control, and prevention of offsite sedimentation and contaminant spills. Therefore, implementation of Mitigation Measure HWQ-1 would reduce the potential construction-related impact to aquatic habitat to a **less-than-significant** level.

Operations-Related Effects to Mammals

The tidally-influenced portion of Marsh Creek downstream of the current effluent discharge location represents potential habitat for special-status mammals such as the saltmarsh harvest mouse and ringtail. Because the hydrology of this area is largely tidally-driven, changes in the flow regime in Marsh Creek are not expected to affect special-status mammals or their habitat in this area. Therefore, the Proposed Project would not result in operational-related effects to the saltmarsh harvest mouse and ringtail.

Marsh Creek downstream of the WWTP effluent discharge location represents potential foraging habitat for special-status bats such as the Townsend's western big-eared bat. The seasonal reduction in effluent discharge under the Proposed Project would lead to reduced water levels in Marsh Creek during the irrigation season, typically May-September, thus potentially affecting foraging habitat for bats. Structures such as bridges and overpasses in the Marsh Creek area represent potential roosting habitat for bat species known to roost in human-made structures, such as Townsend's western big-eared bat. Roosting sites are the most important limiting resource to this species (Zeiner et al 1990). The Proposed Project would have no impact on potential roosting habitat for Townsend's western big-eared bat or other bat species. Furthermore, surrounding open areas, including grasslands, shrublands, and agricultural areas, as well as the tidally-influenced portion of lower Marsh Creek would remain available as foraging habitat. Therefore, operations-related effects of the Proposed Project to special-status bats are considered **less-than-significant** and no mitigation is necessary.

Construction-Related Effects to Special Status Fish

No construction-related disturbances of in-channel or riparian vegetation would occur under the Proposed Project. Construction would occur during the summer months when special-status fishes (i.e., fall-run Chinook salmon) would not be present in Marsh Creek. All stream and drainage channel crossings along the new pipeline alignments are anticipated to be crossed via existing pipeline conduits or attachment to existing bridge infrastructure and any actively flowing stream channel would not be disturbed. Construction activities would be conducted in a manner and location that minimizes the potential for storm water runoff to enter any actively flowing stream channels. Moreover, implementation of Mitigation Measure HWQ-1 (see Section 2.15, "Hydrology and Water Quality") would require the City, or general contractor, to implement Best Management Practices for stormwater runoff, erosion control, and prevention of offsite sedimentation and contaminant spills. As such, the Proposed Project would not adversely affect or modify riparian or aquatic habitats, including habitats used by special-status or migratory fishes. Therefore, potential construction-related effects to aquatic habitat would be **less-than-significant** with implementation of mitigation.

Operations-Related Fisheries Habitat Modification

The seasonal reduction in effluent discharges under the Proposed Project would reduce streamflow depth and velocity in the lower three-mile reach of Marsh Creek downstream of the WWTP outfall. The effect on aquatic habitat availability would be most pronounced during the spring and summer months (i.e., May-September), when the lower portion of Marsh Creek is effluent-dominated and when the greatest reductions in effluent discharges to the creek would occur under the Proposed Project (see Figure 7 and Table 13**).** During the early spring up until about mid-April and in the fall months (i.e., mid-September through October), effluent discharges under the Proposed Project would be similar to, or slightly lower than, the discharges under existing conditions as the irrigation water demands would be low during these periods.

The Proposed Project would not measurably affect effluent discharges during the mid-winter, non-irrigation season, and thus not affect Marsh Creek flows downstream of the WWTP. Furthermore, because the lower reach of Marsh Creek downstream of the WWTP outfall is not effluent-dominated during the winter and spring months (i.e., December-April), Marsh Creek would have substantial background flow and the reduced effluent discharges under the Proposed Project would have little or no measurable effect on aquatic habitat availability in lower Marsh Creek during this period. Consequently, the period of potential concern for aquatic habitat availability and Marsh Creek's warmwater resident fish community is late April through September, while the period of potential concern for adult fall-run Chinook salmon immigration is September and October.

An analysis was conducted to determine the effect of the decreased effluent discharges under the Proposed Project on velocities, maximum depths, and wetted perimeter in Marsh Creek downstream of the WWTP outfall. The two-mile reach immediately downstream of the WWTP outfall has grade control rock weirs constructed approximately every 200 ft interspersed by relatively deep pools (e.g., 3-6 ft under summer base flow conditions), with a very low gradient. The lowest one-mile reach has a nearly level (i.e., 0.00%) slope and lacks the grade control rock weirs.

Under the Proposed Project, the average and minimum flow area, top width, maximum depth, and wetted perimeter would be minimally affected in the two-mile reach immediately downstream of the WWTP outfall (see **Table 7**). The rock weirs maintain relatively constant depths, widths, and wetted perimeters in the pools upstream of each weir over the entire range of summer flow conditions and thus would not have a substantial adverse effect on the quantity of habitat in this two-mile reach downstream of the outfall. However, flow velocity in the two-mile reach downstream of the outfall would be substantially decreased. The lowest velocity on a monthly average basis at the RSW-002 monitoring station (i.e., at one of the grade control rock weirs) in July would be decreased from 0.19 to 0.07 fps, while the lowest monthly flow would be decreased from 0.14 to 0.02 fps under the Proposed Project. The effect of the Proposed Project on velocities would be less pronounced and generally would not be anticipated to result in measurably reduced flows during the fall-run Chinook salmon immigration period.

Table 7. Lower Marsh Creek Section Typical Channel Characteristics-Downstream of WWTP.

Scenario	Flow (CFS)	Velocity (ft/s)	Flow Area (sq. ft)	Top Width (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)
Existing July Average RSW-002 Flow	7.6	0.19	40.88	33.40	1.40	33.85
Projected July Average RSW-002 Flow	2.79	0.07	37.82	32.85	1.31	33.27
Existing July Lowest RSW-002 Flow	5.58	0.14	39.66	33.18	1.36	33.62
Projected July Lowest RSW-002 Flow	0.78	0.02	35.70	32.46	1.24	32.86

Under existing conditions, velocities in lower Marsh Creek downstream of the Brentwood WWTP are low and dry weather flows are typically too low to attract fall-run Chinook salmon or provide adequate conditions for passage through the lower two miles of Marsh Creek. Fall-run Chinook typically hold in the tidal and subtidal areas of Big Break until late-fall or winter storms increase flows in Marsh Creek. The attraction flows from storms induce immigration into the creek and increased flows must occur to facilitate upstream passage in lower Marsh Creek and adequate water depths at low-flow barriers (e.g., rock weirs, the fish ladder just upstream of the Brentwood WWTP outfall). Consequently, the reduction in velocities and small reductions in width, depth, and wetted perimeter would not create barriers or otherwise interfere substantially with the movement of resident or migratory fish in the two-mile reach of Marsh Creek downstream of the outfall. Furthermore, the resident fish species occurring in lower Marsh Creek are adapted to living in low-gradient and low-velocity habitats (e.g., pools, ponds, lakes) and thus would not be adversely affected by reductions in flow velocities in the two-mile reach of Marsh Creek downstream of the Brentwood WWTP outfall.

In the lowest one-mile reach of Marsh Creek, which is tidally influenced and lacks the grade control rock weirs, velocity and wetted perimeter would not be appreciably affected by the reduced effluent discharges under the Proposed Project due to the relatively flat channel bottom. However, depths in this lower one-mile reach could be reduced during the summer months, under the Proposed Project. The average maximum depth under average July flows could be reduced from 0.81 to 0.45 ft, while the average maximum depth under lowest July flows could be reduced from 0.67 to 0.21 ft (**Table 8**).

Table 8. Lower Marsh Creek Section Typical Channel Characteristics-Tidally Influenced Reach.

Scenario	Flow (CFS)	Velocity (ft/s)	Flow Area (sq. ft)	Top Width (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)
Existing July Average RSW-002 Flow	7.6	0.34	22.16	29.85	0.81	30.11
Projected July Average RSW-002 Flow	2.79	0.24	11.78	27.68	0.45	27.83
Existing July Lowest RSW-002 Flow	5.58	0.31	18.20	29.04	0.67	29.26
Projected July Lowest RSW-002 Flow	0.78	0.15	5.34	26.25	0.21	26.32

The analysis used to determine these decreases in average maximum depths assumed that the channel bottom is flat. However, the channel has many relatively deep pools throughout this reach. Furthermore, this reach is characterized as being fully tidally influenced up to the East Bay Regional Park District' footbridge and tidally dampened (i.e., the outgoing creek flows are backed up under high tide) up to the Contra Costa Canal crossing. Depths and flows in this tidally influenced one-mile reach would be relatively unchanged during high tide conditions. Under low tide conditions, resident fish would hold in the deeper pools, as they do under existing conditions. As discussed above, Marsh Creek's resident fish assemblage is composed of species that are adapted to deep water habitats and thus their

movements would not be limited or precluded by shallow water barriers under the Proposed Project where such conditions did not already occur under existing conditions.

Based on the above assessment, the Proposed Project would seasonally reduce flows in the lower 3.5 miles of Marsh Creek during the summer months. However, background flows and pools in lower Marsh Creek would remain to support the resident fish community during these periods. Although delta smelt and Sacramento splittail have the potential to occur in the lower tidally influenced portion of Marsh Creek, these special-status species have never been observed in the creek and the Proposed Project would not adversely affect their potential to make opportunistic use of the tidally influenced portion of the creek. Consequently, the Proposed Project would not have a substantial adverse effect on any candidate, sensitive, or special-status fish species or habitat for special-status fish species and thus is **less than significant**.

Operations-Related Water Temperature Effects to Fish

Hourly temperature monitoring conducted upstream and downstream of the WWTP from July 2004 to January 2006 indicate that the discharge of treated effluent from the WWTP affects monthly average and maximum water temperatures within the lower three miles of Marsh Creek (RBI 2006; **Table 9**). During the winter months, the effluent is typically warmer than Marsh Creek temperatures at the RSW-001 (i.e., upstream of the WWTP) receiving water monitoring station. Consequently, average and maximum monthly temperatures are often higher at RSW-002 (i.e., 300 feet downstream of the WWTP outfall) than temperatures at RSW-001 during the October-May period. During the June-September period, the effluent exerts a small influence on monthly average temperatures at RSW-002 and, based on its relatively narrow daily variability, attenuates the maximum summer temperatures.

Under the Proposed Project, the seasonal reductions in effluent discharges would affect the fully mixed temperatures downstream of the WWTP outfall. During the October-May period, when the effluent discharge causes an increase in fully mixed temperatures downstream of the outfall, the effluent discharge rate would remain the same or would not be reduced substantially, under the Proposed Project, relative to existing conditions. Consequently, the Proposed Project would not substantially affect the fully mixed temperatures in Marsh Creek downstream of the WWTP. During this period, monthly average temperatures are typically less than 70°F and maximum monthly temperatures are below 77°F downstream of the outfall. Under the Proposed Project, fully mixed Marsh Creek temperatures would be approximately the same, or lower, than these monthly values and would be closer to the background temperatures at RSW-001. Therefore, the small incremental change in temperatures during the October-May period would not adversely affect the resident warmwater fish community downstream of the WWTP outfall or the immigrating adult and emigrating early life stages of Chinook salmon, which may occur in lower Marsh Creek from October through early April.

Table 9. Monthly Average and Maximum Temperatures (°F) in Marsh Creek Upstream (RSW-001) and Downstream (RSW-002) of the WWTP Outfall from July 29, 2004 through January 31, 2006.

Month	Monthly Average		Monthly Maximum	
	RSW-001	RSW-002	RSW-001	RSW-002
Jul 2004 [a]	77.3	76.6	81.5	79.6
Aug 2004	75.8	76.1	83.5	81.2
Sep 2004	71.5	73.1	79.9	79.0
Oct 2004	64.3	68.5	73.7	75.2
Nov 2004	56.7	64.8	62.8	68.6
Dec 2004	52.8	61.1	59.7	67.2
Jan 2005	49.2	51.6	54.6	58.2
Feb 2005	55.4	57.5	60.8	63.4
Mar 2005	59.8	60.2	69.5	68.9
Apr 2005	63.0	63.4	70.7	69.5
May 2005	70.0	69.3	79.0	76.8
Jun 2005	72.2	72.2	79.9	79.3
Jul 2005	79.6 [b]	77.1	86.1	81.8
Aug 2005	76.7	76.2	85.5	81.2
Sep 2005	70.3	72.2	80.2	78.7
Oct 2005	64.6	69.1	73.8	75.9
Nov 2005	60.0	67.8	63.7	70.7
Dec 2005	54.2	60.6	61.2	66.3
Jan 2006	54.0	53.6	58.1	59.7

[a] Average and maximum for July 29–31, 2004.
[b] Average for July 13–31, 2005.

A temperature monitoring study (in preparation) being conducted by RBI for the City at seven locations in Marsh Creek, extending from RSW-001 downstream to the terminus of Marsh Creek at Big Break, indicates that during the winter and early spring months (December-April) the effect of the WWTP discharge on Marsh Creek temperatures does not extend to the tidally influenced reach within one mile of Big Break. This period coincides with the period during which delta smelt or Sacramento splittail could make opportunistic use of the tidal reach of Marsh Creek, if conditions are favorable. However, because the temperatures in this reach are influenced primarily by the temperatures of tidal water and are unaffected by WWTP discharges during these months, any changes to the Marsh Creek temperature regime under the Proposed Project would not extend far enough downstream during the December-April period to adversely affect the potential opportunistic use of lower Marsh Creek by delta smelt or Sacramento splittail.

The greatest reduction in effluent discharge would occur during the months of June through September under the Proposed Project. During this period, the effluent discharge provides the majority of Marsh Creek's flow downstream of the WWTP outfall. The reductions in effluent discharge would result in a smaller effect of the effluent temperature on fully mixed

creek temperatures downstream of the outfall, resulting in a slight increase in maximum monthly temperatures downstream of the outfall. Consequently, temperatures downstream of the outfall would more closely resemble the temperatures measured at RSW-001 upstream of the outfall, which is less than 80°F on an average monthly basis and 86°F or less as a monthly maximum. The resident fish community of Marsh Creek, which supports the same fish species upstream and downstream of the WWTP outfall, is adapted to living in warmwater streams and lakes of the Central Valley, where typically reach and exceed 86°F during the summer months. Consequently, the reduction in effluent discharges and resulting change in temperatures to more closely resemble temperatures upstream of the outfall would not adversely affect the same resident warmwater fish community that occurs downstream of the outfall. Therefore, changes in temperature associated with the reduction in effluent discharges under the Proposed Project would not have substantial adverse effects on aquatic habitats in lower Marsh Creek and thus is **less than significant**.

b) Construction- and operations-related activities have the potential to adversely affect riparian habitat in the project area, as follows.

Construction-Related Effects to Riparian Habitat

There is no riparian habitat or other sensitive natural communities in the construction area. There are sand deposits at the WWTP within the northerly alternative recycled water storage tank location. The sand deposits are identified as an uncommon landscape feature in the ECCCHCP. There are also small patches of riparian habitat, consisting of two small groves of Fremont cottonwoods, outside of but adjacent to the project area at the RRPS site and at the southerly alternative storage tank location at the WWTP. Potential construction-related disturbances to riparian habitats are considered a potentially significant impact. Adverse effects to riparian habitats and landscape features would be avoided through implementation of BIO-1, which requires that the construction activities be limited to the designated work area and that the work area to be clearly identified, staked, and flagged where necessary prior to initiation of construction activities. This would include flagging of riparian habitats in the vicinity of work areas to ensure their avoidance and protection. Implementation of Mitigation Measure BIO-1 would reduce potential impacts to sensitive habitats to **less than significant.**

Operations-Related Effects to Riparian Habitat

The tidally-influenced portion of lower Marsh Creek has discontinuous riparian shrub and tree cover. Flows in Marsh Creek during May-September under Existing Conditions are fairly low, and thus the lower portion of Marsh Creek is tidally dominated to some distance upstream of Big Break. The seasonal reduction in Marsh Creek streamflow downstream of the WWTP under the Proposed Project is not expected to substantially alter water quality or flow conditions in the existing tidal portion of Marsh Creek, nor is the change in flows expected to substantially alter the distance upstream that is influenced by the tides. Thus, habitat and vegetation in the tidally-influence portion of the creek is not expected to be affected by the reduction in flows. Therefore, the potential operations-related effects of the

Proposed Project to riparian habitat or other sensitive natural communities is **less than significant.**

c) No construction activities for the Proposed Project would occur directly in any jurisdictional waters or wetlands. Moreover, no wetlands or seasonal wetlands, or any other potentially jurisdictional or isolated waters, are located within areas to be disturbed by construction activities. However, the pipeline alignment crosses jurisdictional waters at four locations: 1) Dry Creek at the Roddy Ranch Pump Station; 2) the Deer Creek channel that crosses under Fairview Ave.; 3) Sand Creek at the intersection of Fairview Ave. and Sand Creek Rd.; and, 4) Marsh Creek at the intersection of Sand Creek Rd. and O'Hara Ave. As described in the Project Description and shown in Figures 2 and 3, there are existing pipelines and a PGE gas pipeline along the alignment that are anticipated to serve as existing conduits across the defined stream channels. Consequently, no earth-disturbing construction or project-related activities are proposed over any of these stream crossings. Therefore, no jurisdictional waters or wetlands would be affected at stream crossings with these pipeline sections. At the Dry Creek channel, open-trench construction and pipe installation would occur either in the paved sidewalk or roadway, or possibly along the adjacent unpaved shoulder, to connect pipe from the proposed storage tank to the existing piping at the Roddy Ranch Pump Station. The work would be conducted with conventional work practices and erosion control measures to prevent any discharge of sediment or runoff to the creek channel from the work site.

The storage tank and other piping work near the Roddy Ranch Pump Station is located adjacent to a small wetland habitat area formed within the Dry Creek channel, which is characterized by dense cattails (*Typha sp*.) and bulrush (*Schoenoplectus sp*.). Potential impacts to this habitat would be avoided through implementation of BIO-1, which requires construction activities to be limited to the designated work area and the work area to be clearly identified and flagged where necessary prior to initiation of construction activities. This would include flagging of wetland habitats in the vicinity of work areas to ensure their avoidance and protection. Implementation of Mitigation Measure BIO-1 would reduce and further minimize any potential adverse effects to water bodies.

The seasonal reduction in Marsh Creek streamflow downstream of the WWTP under the Proposed Project is not expected to substantially alter streamflow conditions, or hydrology in the tidal portion of Marsh Creek including the distance upstream that is influenced by the tides. Thus, hydrology and vegetation characteristics in the tidally-influenced portion of the creek are not expected to be affected by the reduction in flows. Therefore, the potential construction- and operations-related effects of the Proposed Project to wetland resources are considered **less than significant**.

d) There are no known migratory wildlife corridors or native wildlife nursery sites in the project area. Construction activities could temporarily affect the movement of native resident or migratory wildlife that may be present in the project area. However, implementation of Mitigation Measure BIO-1 would minimize the potential effects by restricting all project-related activities to the defined work area and limiting construction to

daylight hours. Due to the temporary and limited nature of potential disturbance to wildlife movement, this impact is considered **less-than-significant**.

Operations-Related Effects on Fish Migration

Adult fall-run Chinook salmon migrate into Marsh Creek when attraction flows are sufficient in October through December. Post-emergent fry and smolts emigrate from Marsh Creek to the Delta from December through early April under high-flow conditions (e.g., spring freshets). Because spawning and rearing of early life stages occur upstream of the WWTP outfall, the lower three-mile reach of Marsh Creek serves as a migration corridor for immigrating adults and emigrating post-emergent fry and smolts. During this October-April period, effluent discharges under the Proposed Project would be slightly lower relative to the existing conditions only during the late spring and early fall periods when irrigation demands and deliveries of the recycled water would occur (Figure 9 and Figure 10). However, the small reduction in effluent flows that would occur under the Proposed Project would not measurably affect the magnitude of fall-winter storm events, or flows during the spring emigration period, and thus would have no effect on the ability for adult or early life stages of fall-run Chinook salmon to move upstream or downstream through the lower three miles of Marsh Creek downstream of the WWTP outfall. Consequently, the reductions in effluent discharges that would occur under the Proposed Project would not substantially interfere with the movements of any native resident or migratory fish species. Therefore, this impact is considered **less than significant**.

e) Contra Costa County has a Tree Preservation Ordinance that provides for the preservation of certain protected trees in unincorporated areas of the county. However, the City does not have a Tree Preservation ordinance. However, no trees would be removed for the Proposed Project and there are no other local policies or ordinances protecting tree resources. Therefore, there would be **no impact**.

f) The City would participate in the ECCCHCP for the Proposed Project. This coverage would allow the City to minimize and compensate for potential effects resulting from construction- and operation-related activities associated with the Proposed Project. Therefore the Proposed Project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan and there would be **no impact**.

3.5 CULTURAL RESOURCES

Would the project…	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	☐	☐	☐	☑
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☐	☑	☐	☐

c)	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☑	☐	☐
d)	Disturb any human remains, including those interred outside of formal cemeteries?	☐	☑	☐	☐

3.5.1 Setting

The following section summarizes information presented in **Appendix B**, which contains a comprehensive discussion of the cultural resources setting of the region and City areas, and information regarding known and potential historical, archaeological, and paleontological resources in the project area, and regulatory framework. The report was prepared by Ric Windmiller, Consulting Archaeologist.

Efforts to identify cultural resources in the project area consisted of database searches, literature review, and an archaeological field inspection. On October 6, 2014, the Northwest Information Center completed a cultural resources records search of the proposed recycled water storage tank locations plus a quarter mile radius around each location, as well as the pipeline route along Fairview Ave. and Sand Creek Rd. plus a one-eighth mile radius (NWIC File No. 14-0315). The Native American Heritage Commission's sacred lands file search was conducted on September 3, 2014, and letters were sent to recommended Native American contacts; however the inquiry failed to identify any Native American cultural resources in the project vicinity. On September 22, 2014, Kenneth L. Finger, Ph.D., conducted a search of the University of California, Museum of Paleontology's database.

On November 5, 2014, a field inspection was conducted of the pipeline route, the northerly alternative storage tank location (i.e. the southerly site was not known at the time of the survey), and two alternative storage tank locations at the WWTP site. The archaeological survey of the proposed pipeline route was conducted of exposed ground, which was limited to existing open space within 15 meters of each side of Sand Creek Rd. from the east end of Sand Creek Rd. to its intersection with Fairview Ave. In and around the east end of Sand Creek Rd., new residential construction was underway and the ground surface was exposed for inspection, as well. Along Fairview Ave., vacant land was primarily north of the southeast corner of Fairview and Central Rd. and the visual inspection was conducted within 15 meters of the road's edge. In each case ground visibility was good with very little vegetation.

At the RRPS site, a triangular-shaped area of vacant land between Fairview on the west, a new residential neighborhood on the north and Dry Creek on the south was inspected on foot along zig-zagging transects about five meters apart. The gravelly ground surface was largely bare of vegetation and visibility was good. The two alternative storage tank locations at the WWTP lie within a narrow strip of land bordered on the east by a fence and on the west by the treatment plant. The area was weedy; visibility of the ground surface varied between 20 and 80 percent. The areas around and between the alternative storage tank locations appear to have been graded at some time in the past. The area was inspected along zig-zagging transects approximately five meters apart.

3.5.2 Discussion

a) The records search identified the Southern Pacific Railroad (aka Central Pacific Railroad/San Pablo-Tulare Railroad) and two bridges along the proposed pipeline route as potential cultural resources. These features were observed during the field survey, and no other potential historical resources were identified during the survey of the pipeline routes, RRPS site, or the WWTP site. The Southern Pacific Railroad (aka Central Pacific or San Pablo-Tulare; P-07-000813) where it crosses Sand Creek Rd.; the O'Hara Ave. (and Sand Creek Rd.) bridge across Marsh Creek (Bridge No. 28C0258), and the Sand Creek Rd. bridge across Sand Creek (Bridge No. 28C0399) are all located along the proposed pipeline alignment. The Southern Pacific Railroad lies on a high earthen berm with wooden ties and standard gauge tracks. The California Department of Transportation (Caltrans) August 2013 Structure Maintenance & Investigations show that the bridges were evaluated as not being eligible for the National Register of Historic Places. The bridges do not appear to have been evaluated for California Register of Historical Resources eligibility. The Marsh Creek bridge was constructed in 2002, and the Sand Creek bridge was constructed in 1966 (less than 50 years old) but was widened in 2002.

   Based on the preliminary construction plans for the Proposed Project, existing conduits already in place at the two bridge locations, as well as pipelines that exist under the railroad, would be used as conduits for the recycled water system. Consequently, the proposed project would have no adverse effect on these structures. Therefore, there would be **no impact**.

b) Temporary construction activities for the Proposed Project would involve ground disturbing activities including grading, and could involve excavations of up to about 8 feet (or more) for the recycled water pipeline construction. No prehistoric or historic archaeological resources were identified during the field survey of the pipeline alignments, the northerly alternative storage tank site at the RRPS, or the two alternative storage tank locations at the WWTP. However, construction activities have the potential to encounter buried archaeological resources as the lack of surface indications does not always ensure that there are no buried sites, features or objects of significance. Buried archaeological resources may include but are not limited to deposits of stone, bone and shell artifacts, dark gray "midden" sediments, historic trash deposits, and stone or adobe foundations. Therefore, the impact is considered potentially significant. Implementation of Mitigation Measure CULT-1 would reduce this impact to a **less-than-significant** level.

MITIGATION MEASURE CULT-1. ACCIDENTAL DISCOVERY OF ARCHAEOLOGICAL RESOURCES.
If any prehistoric or historic artifacts, or other indications of archaeological resources such as unusual deposits of stone, bone or shell, stone artifacts, or historic trash deposits or foundations are discovered once ground-disturbing activities are underway, the find(s) shall be immediately evaluated by a qualified archaeologist. If the find is determined to be a historical or unique archaeological resource, contingency funding and a time allotment to allow for implementation of

avoidance measures or appropriate mitigation shall be made available, as provided in §15064.5 of the CEQA Guidelines. Work may continue on other parts of the project site while historical or unique archaeological resource mitigation takes place on-site.

c) No paleontological resources were identified during the field inspection, nor were any previous finds reported in the database search specifically at the proposed storage tank locations or along the proposed pipeline alignments. However, the database search did conclude that one locality (V92081) is within the project vicinity and yielded fossil remains of American mastodon (*Mammut americanus*). The paleontological database search indicates that potentially important vertebrate fossils may occur in a two older alluvial deposits that occur in the project area. Undifferentiated Pleistocene or Pliocene gravel exists in the vicinity of the RRPS and in an approximately 0.5-mile long segment of Fairview Ave. where Deer Creek crosses under Fairview Ave. (near Central Blvd.). Additionally, Holocene and Pleistocene dune sands occur at the WWTP. The Holocene deposits are too young to yield fossils, however, deep excavation in older Pleistocene units at the RRPS, WWTP, and an approximately 0.5-mile long segment of Fairview Ave. centered at the Central Blvd. has the potential to encounter vertebrate fossils. The impact is potentially significant. Implementation of Mitigation Measure CULT-2 would reduce this impact to a **less-than-significant** level.

MITIGATION MEASURE CULT-2. ACCIDENTAL DISCOVERY OF PALEONTOLOGICAL RESOURCES.

A qualified professional paleontologist shall periodically monitor excavations to check for fossils that may be unearthed. If vertebrate fossils (e.g., teeth, bones) are unearthed by the construction crew anywhere on the project, the finds should be set aside and all excavation activity cease at the specific place of discovery until the paleontologist has assessed the find and, if deemed significant, salvaged the find in a timely manner. The decision to conduct paleontological salvage operations will be determined by the paleontologist in consultation with City staff. Work may proceed on other parts of the project while assessment and/or salvage by the paleontologist is underway. Finds determined significant by the paleontologist shall be conserved and deposited with a recognized repository such as the University of California Museum of Paleontology.

d) Human remains were not discovered during the field investigation for the Proposed Project. While it is unlikely, there is a possibility that buried human remains may be encountered during construction. The impact is potentially significant. Implementation of Mitigation Measure CULT-3 would reduce this impact to a **less-than-significant** level.

MITIGATION MEASURE CULT-3. ACCIDENTAL DISCOVERY OF HUMAN REMAINS.

In the event of the accidental discovery or recognition of any human remains, there shall be no further excavation or disturbance of the find or any nearby area

reasonably suspected to overlie adjacent human remains, until compliance with the provisions of §15064.5(e)(1) and (2) of the CEQA Guidelines has occurred. The Guidelines specify that in the event of the discovery of human remains other than in a dedicated cemetery, the Contra Costa County Coroner must be notified to determine if an investigation into the cause of death is required. If the coroner determines that the remains are Native American, then, within 24 hours, the coroner must notify the Native American Heritage Commission, which in turn will notify the most likely descendant who may recommend treatment of the remains and any grave goods. If the Native American Heritage Commission is unable to identify a most likely descendant or the most likely descendant fails to make a recommendation within 24 hours after notification by the Native American Heritage Commission, or the landowner or his authorized agent rejects the recommendation by the most likely descendant and mediation by the Native American Heritage Commission fails to provide a measure acceptable to the landowner, then the landowner or his authorized representative shall rebury the human remains and grave goods with appropriate dignity at a location on the property not subject to further disturbances.

3.6 GEOLOGY, SOILS, AND SEISMICITY

Would the project…	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant Impact	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) 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? Refer to Division of Mines and Geology Special Publication 42.	☐	☑	☐	☐
ii) Strong seismic ground shaking?	☐	☑	☐	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☑	☐	☐
iv) Landslides?	☐	☐	☐	☑
b) Result in substantial soil erosion or the loss of topsoil?	☐	☑	☐	☐
c) 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 on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☑	☐	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☑	☐	☐
e) 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?	☐	☐	☐	☑

3.6.1 Setting

The city of Brentwood is located within a seismically active region east of San Francisco. The project area is not located in an Alquist-Priolo Earthquake Fault Zone (City of Brentwood 2014b). The Greenville Fault is the nearest active fault located approximately 7 miles southwest of the City. Potential seismic hazards include ground rupture, or surface faulting, and ground shaking or lurching. Fault ground ruptures are generally confined to a narrow linear zone adjacent to faults. Fault ground ruptures are unlikely to occur in the project area because there are no active faults mapped in the project area by the California Geological Survey. However, the project area is potentially subject to strong ground shaking from regional seismic activity.

The land forms within the project area where construction activities would occur are generally level and therefore not prone to landslides. However, the potential for soil to be susceptible to liquefaction hazard, or to be expansive (i.e., shrink-swell potential) varies substantially throughout the city (City of Brentwood 2014b).

3.6.2 Discussion

a, c, d) Fault ground ruptures are unlikely in the project area as there are no active faults mapped across the site by the California Geological Survey and the sites are not located in any Alquist-Priolo Earthquake Fault Zone. However, fault rupture from buried thrust faults and inferred faults represent a potential but uncertain hazard in the project area. The project area is subject to potentially strong ground-shaking during seismic events that could occur from active faults in the region. Additionally, the sites where the proposed recycled water pipelines and facilities would be constructed have potential to contain expansive soils, have elevated risk of liquefaction, and may exhibit corrosive soil properties. These properties have potential to compromise the structural integrity of the proposed pipelines and recycled water storage tanks.

Structural failure of the proposed recycled water pipelines and facilities would potentially pose a risk to life, property, and environmental resources. Therefore, the potential exposure of recycled water pipelines to seismic hazards and surface soil hazards is considered a potentially significant impact. With implementation of Mitigation Measure GEO-1, this impact would be **less than significant**.

MITIGATION MEASURE GEO-1. CONDUCT GEOTECHNICAL INVESTIGATION AND IMPLEMENT RECOMMENDED MEASURES.

The City will conduct a geotechnical investigation for the Proposed Project that evaluates site-specific conditions related to the potential for ground rupture, risk to features due to ground shaking, risk of soil liquefaction, and risk of expansive soils. Based on subsurface conditions, the proposed pipelines and appurtenances will be designed to withstand the effects of strong ground shaking and the effects of soil liquefaction.

Based on the results of the geotechnical investigation, the City and its contractor(s) will be responsible for implementing the design specification and performance criteria

according to Uniform Building Code (UBC) the City's Seismic Hazards policies for pipeline construction, trenching, backfill materials, and other recommendations.

b) The temporary construction-related activities have the potential to result in localized and temporary soil erosion, in particular when exposed to rainfall and stormwater runoff events on a seasonal basis during the winter rainfall period. However, the Proposed Project would not involve any operations-related activities that would cause or contribute to any long-term soil erosion. The potential for temporary construction-related erosion is considered a potentially significant impact. Mitigation Measure HWQ-1 is identified in Section 3.9 ("Hydrology and Water Quality") and would require the City and general contractor(s) for the Proposed Project to implement construction-related erosion and stormwater management measures. With implementation of Mitigation Measure HWQ-1, this impact would be **less than significant**.

e) The Proposed Project would not contribute to use of septic tanks or alternative wastewater disposal systems. Therefore, there would be **no impact**.

3.7 GREENHOUSE GASES AND CLIMATE CHANGE

Would the project…	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☑	☐
b) Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☑	☐

3.7.1 Setting

Certain gases in the earth's atmosphere, classified as Greenhouse Gases (GHGs), play a critical role in determining the earth's surface temperature. GHGs are responsible for "trapping" solar radiation in the earth's atmosphere, a phenomenon known as the greenhouse effect. Prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO2), methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

Human-caused emissions of these GHGs in excess of natural ambient concentrations are responsible for intensifying the greenhouse effect and have led to a trend of unnatural warming of the earth's climate, known as global climate change or global warming. It is extremely unlikely that global climate change of the past 50 years can be explained without the contribution from human activities (Intergovernmental Panel on Climate Change (IPCC) 2007:86). By adoption of Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006, and Senate Bill (SB) 97, the State of California has acknowledged that the effects of GHG emissions

cause adverse environmental impacts. AB 32 mandates that emissions of GHGs must be capped at 1990 levels by the year 2020 (Health and Safety Code section 38530).

Emissions of GHGs have the potential to adversely affect the environment because such emissions contribute, on a cumulative basis, to global climate change. Although the emissions of one single project, such as this, would not cause global climate change, GHG emissions from multiple projects throughout the world could result in a cumulative impact with respect to global climate change.

Regulatory Framework

Legislation and executive orders on the subject of climate change in California have established a statewide context and a process for developing an enforceable statewide cap on GHG emissions. Given the nature of environmental consequences from GHGs and global climate change, CEQA requires that lead agencies consider evaluating the cumulative impacts of GHGs, even relatively small (on a global basis) additions. Small contributions to this cumulative impact (from which significant effects are occurring and are expected to worsen over time) may be potentially considerable and therefore, significant.

Therefore, the global climate change analysis presented in this section estimates and analyzes the GHG emissions associated with construction- and operations-related activities that would occur under the Proposed Project.

Methods

Please refer to the discussion under Section 3.3 ("Air Quality") above for explanation of the emissions calculations methods and assumptions. As mentioned in the Section 3.3("Air Quality"), there is an existing court order on BAAQMD's adopted 2010 CEQA Thresholds of Significance. Although the Alameda County Superior Court has ordered the BAAQMD to cease dissemination of the previously adopted threshold of 1,100 Metric Tons of carbon dioxide equivalent (CO2e) per year, the court has made no finding on the applicability or the merits of the quantitative threshold (BAAQMD 2010). The CEQA Thresholds Options and Justification Report outlines substantial evidence supporting a variety of thresholds of significance (BAAQMD 2009). Therefore, because the proposed project would result in emissions of GHGs from mobile and indirect sources (i.e., energy consumption), and is located within the BAAQMD's jurisdiction for which these thresholds were determined to be applicable, the County considers the threshold of 1,100 MT CO2e/yr to be an acceptable threshold for CEQA significance with regards to GHG emissions.

Thus, based on Appendix G of the CEQA Guidelines, impacts are considered significant if implementation of the proposed project would do any of the following:

- generate GHGs, either directly or indirectly, that may have a significant impact on the environment (i.e., result in emissions that exceed 1,100 MT CO2e/yr); or

- conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

3.7.2 Discussion

a) Construction of the project would generate GHG emissions from off-road heavy-duty equipment, trucks hauling construction supplies, and worker commute trips. Emissions associated with construction activities were estimated using the RCEM (Version 7.1.5.1) and CalEEMod (Version 2013.2.2) computer models. As with the methodology used to calculate criteria pollutant emissions, pipeline installation and paving activities were modeled using RCEM, while the construction of the proposed storage tanks were modeled using CalEEMod.

GHG emissions generated by the project would predominantly consist of CO2. In comparison to criteria air pollutants, such as ozone and PM10, CO2 emissions persist in the atmosphere for a substantially longer period of time. While emissions of other GHGs, such as methane and nitrous oxide, are important with respect to global climate change, they are less a function of construction activities associated with the construction and operation of the proposed project than are levels of CO2. Additionally, both the RCEM and CalEEMod models report CO2, but only CalEEMod also reports other GHG emissions. Thus, because non-CO2 emissions are anticipated to make up a minor percentage of project emissions and to maintain consistency between model outputs, only CO2 emissions were addressed in this analysis. Annual GHG emissions associated with construction of the project are shown in **Table 10.** As shown in Table 10 annual GHG would not exceed the SMAQMD threshold of significance during any of the years of construction.

Table 10. Summary of Modeled Emissions of GHG Associated with Project Construction Activities in 2015.

Parameter	CO_2 (MT/year)
Pipeline and Pavement Construction[1]	270.3
Storage Tank Construction[2]	205.9
Project total emissions	476.2
BAAQMD Thresholds of Significance	1,100

Notes:
1 Modeled using the Sacramento Rd. Construction Emissions Model. Includes worker commute and hauling emissions from both pipeline and storage tank construction.
2 Modeled using CalEEMod.

AAQS = Ambient Air Quality Standards
BAAQMD = Bay Area Air Quality Management District
BMPs = Best Management Practices
lb/day = pounds per day
CO_2 = carbon dioxide
MT = Metric Tons

Modeled values represent total emissions that would occur over the duration of the construction period. See Appendix A for detail on model inputs, assumptions, and project specific modeling parameters.
Source: Modeling conducted by Ascent Environmental in 2014.

During operation, the project-related electrical energy use for pumping recycled water would be reduced by an estimated 120,000 kWh annually compared to the existing conditions energy use for delivery of potable and non-potable water supplies. No additional mobile-source emissions are anticipated above existing levels given no changes in workers or worker commute trips are anticipated compared to existing conditions. Any emergency use of diesel back-up generators would be similar or lower under the Proposed Project as well as a result of lower pumping energy required. Therefore, the reduced energy use would result in a net reduction of 20.16 MTCO2 per year relative to existing conditions, based on forecasted electricity emission factors from Pacific Gas & Electric, 0.168 MTCO2 per MWh (Pacific Gas & Electric 2013). Annual emissions offsets further into the future may be lower due to lower anticipated emission factors via the Renewable Portfolio Standard and other utility driven green energy purchases. Based on these analyses, GHG emissions from construction and operation are not expected to exceed selected BAAQMD thresholds. Therefore, this impact is expected to be **less-than-significant**.

b) As discussed in (a) above, the project would demonstrate compliance with BAAQMD thresholds for GHG emissions. BAAQMD's recommended thresholds and mitigation measures were developed to show consistency with AB 32 and the Scoping Plan. Therefore, the project would not conflict with or obstruct implementation of ARB's Scoping Plan for achieving GHG reductions consistent with AB 32 and would achieve reductions consistent with BAAQMD's guidance. This impact would be **less-than-significant**.

3.8 HAZARDS & HAZARDOUS MATERIALS

	Would the project…	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant Impact	No Impact
a)	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☑
b)	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☑
c)	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☑
d)	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☑
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☑

f)	For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☑
g)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☑
h)	Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☑

3.8.1 Setting

A hazardous waste is a substance, or mixture, with properties that make it potentially dangerous or harmful to human health or the environment. Specifically, hazardous wastes include waste listed on one of the four Resource Conservation and Recovery Act (RCRA) hazardous wastes lists—the F-list (non-specific source wastes), K-list (source-specific wastes), P-list and U-list (both lists consist of discarded commercial waste products), or that exhibits one of the four characteristics of a hazardous waste—ignitability, corrosivity, reactivity, or toxicity.

The Proposed Project facilities are not located within two miles of any airport or airstrip, and no hazardous waste sites are anticipated to be encountered in the project area (City of Brentwood 2014b). The site also is not located in a wildland fire hazard area or a designated California Department of Forestry and Fire Protection area.

3.8.2 Discussion

a-h) The Proposed Project does not involve any construction or change in operations that would change the use of any hazardous materials or affect or generate hazardous wastes. Therefore, no effects on hazards and hazardous materials are anticipated as a result of implementing the Proposed Project. Therefore, there would be **no impact**.

3.9 HYDROLOGY AND WATER QUALITY

	Would the project…	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant Impact	No Impact
a)	Violate any water quality standards or waste discharge requirements?	☐	☑	☐	☐
b)	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☑

c)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☑	☐
d)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☑	☐
e)	Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☑	☐
f)	Otherwise substantially degrade water quality?	☐	☐	☑	☐
g)	Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☑
h)	Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☑
i)	Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☑
j)	Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☑

3.9.1 Setting

Regional Overview

Brentwood is located within the Marsh Creek watershed in eastern Contra Costa County. Brentwood is located in a Mediterranean climate with dry, warm summers and cool, wet winters. Annual rainfall averages about 12.5 inches, which occurs primarily from November through March. Brentwood lies within the Marsh Creek watershed which originates on the eastern flanks of Mount Diablo in the Diablo Range of the coastal mountains. Topography within the City and project area includes low hills of the Diablo Range up to an elevation of about 425 feet above mean sea level (msl), and a generally level alluvial plane surrounding the Sacramento River-San Joaquin Delta (Delta) that slopes east and north down to an elevation of about 25 feet msl.

Surface Water Resources

Marsh Creek is the dominant stream in the project area. From the slopes of Mount Diablo, Marsh Creek passes through Brentwood and traverses north to its confluence with the San Joaquin River and the large embayment area known as Big Break. A dam forms Marsh Creek Reservoir at the base of the foothills, about ten river miles upstream from Big Break where Marsh Creek enters the City limits, and provides detention of high flows for flood control and storage of winter runoff. Downstream from the reservoir, Marsh Creek is a generally meandering channel and transitions to a large constructed trapezoidal channel with flood protection levees downstream of the confluence with Sand Creek. Dry Creek, Deer Creek, and

Sand Creek are small streams that flow eastward from the slopes of the Diablo Range to join the lower Marsh Creek channel. Rainfall runoff generated in the City is conveyed via the stream channels, and constructed stormwater drainage systems that discharge to the ditches, streams, and Marsh Creek areas within the City. All of these streams within the City have generally been straightened with constructed flood control levees, which are under the control of the Contra Costa County Flood Control and Water Conservation District (CCCFCWCD). The lower Marsh Creek channel within the City limits has a designated 100-year floodplain by the Federal Emergency Management Agency (FEMA) that is generally confined within the flood control levees in the project area, and the WWTP is not located within the 100-year floodplain (City of Brentwood 2014b).

The United States Geological Survey (USGS) installed a streamflow gauge in Marsh Creek approximately 800 feet upstream of the WWTP effluent discharge outfall, and thus represents the natural runoff in the upper watershed. The City operated the gauge until October 2013. A summary of descriptive statistical streamflow parameters based on monthly average streamflow data from the USGS gauge are shown in **Table 11**, which indicate that the lowest average streamflow occurs during July through September. Daily data from the USGS gauge indicates nearly continuous flow throughout the year; however, periods of no flow occurred in several periods in May 2012 and July 2012 lasting up to several days at a time. Continuous flow was observed in the critical water years of 2007, 2008, and 2013. A review of historical aerial photos of Marsh Creek taken during low-streamflow conditions indicates that the year-round flow occurs in the approximately four miles of lower Marsh Creek channel from the Dry Creek confluence to the WWTP outfall. The aerial photos indicate that the reach upstream of the Marsh Creek Reservoir is ephemeral (i.e., exhibiting seasonal streamflow conditions in the winter months and dry conditions in the summer months). The generally continuous streamflow pattern downstream of the reservoir within the City urban area is likely associated with the additional flow contributed from Dry Creek, Sand Creek, and Deer Creek, urban drainage, and incidental runoff from landscape irrigation and golf courses. The Brentwood WWTP contributes additional year-round flow to the lower reach of Marsh Creek that is relatively constant throughout the year (i.e., daily average discharge of 5.1 CFS or 3.3 MGD in 2013). The WWTP discharge comprises a majority of the total streamflow in the lower reach of Marsh Creek during the summer months. Tidal action provides daily water exchange in the lower one mile of the Marsh Creek channel. There is no streamflow gauge in Marsh Creek downstream of the WWTP.

Table 11. Descriptive Statistical Streamflow Variables (CFS) for Marsh Creek at the USGS Gauge (#11337600) for the 2001-2013 Water Years.

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Count	403	367	403	390	403	390	403	409	420	403	390	403
Average	21.0	18.1	19.6	14.2	5.0	3.5	2.7	2.9	2.7	3.6	3.4	18.1
Std Dev	65.1	38.1	42.5	38.6	6.1	2.9	1.7	2.2	2.5	18.3	14.8	60.1
Minimum	1.1	1.1	0.9	1.7	0.5	0.8	0.6	0.5	0.5	0.9	0.5	0.3
Maximum	83.8	48.9	75.4	105.7	18.6	6.4	5.4	5.6	5.2	13.7	13.5	70.1

Groundwater Resources

As defined by the Department of Water Resources (DWR) in Bulletin 118 (DWR 2006), Brentwood is located towards the northern end of the Tracy Subbasin of the San Joaquin Valley Groundwater Basin. Freshwater resources within the subbasin occur in the upper continental deposits created from erosion associated with variable lake, stream, and sea level changes in the Central Valley over the past 5 million years. The continental deposits are characterized by the following four major stratigraphic layers: Tulare Formation, Older Alluvium, Flood Basin Deposits, and Younger Alluvium and begin at the western edge of the uplifted Diablo Range foothills, and increase in depth to about 3,000 feet along the eastern margin of the subbasin. The City has seven municipal water supply wells in service that are constructed at depths of 200 to 660 feet below ground surface (BGS) in the Tulare Formation. The Tulare Formation consists of semi-consolidated, poorly sorted, and discontinuous layers of gravel, sand, silt, and clay. Most domestic wells in the region are shallower and constructed in overlying alluvium that is up to about 150 feet thick.

Groundwater conditions in the Brentwood region (e.g., water table levels, groundwater storage) are a function of geologic characteristics of the aquifers, sources of groundwater recharge (i.e., rainfall, runoff in stream channels, and agricultural irrigation drainage), groundwater pumping for agricultural and municipal use, and lateral groundwater inflow and outflow from the area. A comprehensive review of groundwater information for the City conducted in the late 1990's identified that groundwater levels under the Brentwood region are slightly sloped downward from west to east in the southern part of the City, and southwest to northeast in the northern area (Lawrence Livermore National Laboratory 1995). At the time of the study, the largest source of groundwater recharge was agricultural irrigation and drainage associated with the approximately 37,500 AFY of water delivered to farms in the Brentwood area by the East Contra Costa Irrigation District (ECCID), followed by rainfall and groundwater inflow to the basin. The City and ECCID's uses of groundwater represented the largest sources of groundwater extraction, and groundwater was the City's only source of water until the late 1990's, with combined City/ECCID pumping levels up to about 7,000 AFY. The water table ranged from about 25 feet BGS in the north and east sections to about 100 feet BGS near the base of the Diablo Range foothills, and as evidenced by relatively stable levels over the previous 50 years, indicated that groundwater storage was generally static throughout the region with no substantial losses or gains.

As growth in the City occurred, the City developed a municipal water service system and began purchasing surface water from the Contra Costa Water District (CCWD), and recently completed construction of the Brentwood Water Treatment Plant (WTP) in 2008 to facilitate additional use of surface water from the Delta. The City's water supply is now comprised of an average of about 70 percent surface water (i.e., averaging 7,000 AFY) and 30 percent groundwater. Groundwater use in 2009-2013 (since the Brentwood WTP came online) has ranged from 2,700 AFY to 4,900 AFY.

Surface and Groundwater Quality

Available information characterizing existing water quality conditions in Marsh Creek is limited to routine weekly monitoring data collected by WWTP staff for the NPDES permit for several general parameters (i.e., temperature, dissolved oxygen [DO], electrical conductivity [EC], pH, and turbidity) at a site upstream and site downstream of the effluent discharge (RSW-001 and RSW-002, respectively). In general, the majority of the upstream Marsh Creek flows are anticipated to be relatively low in contaminants of concern because the upper watershed is undeveloped and there aren't major natural or industrial contaminant sources. However, within the city limits, urban stormwater runoff can contain suspended sediment, trash, organic matter, nutrients (e.g., nitrogen and phosphorus), pathogens (i.e., bacteria and viruses from fecal wastes of domesticated animals and pets), vehicle wastes from pavement including petroleum products and trace metals (e.g., copper), and commonly used residential and commercial landscape pesticides. The Marsh Creek channel downstream of Marsh Creek Reservoir is designated impaired by diazinon, mercury, E. coli bacteria, sediment toxicity, and unknown toxicity in the State Water Resources Control Board (SWRCB) 2010 Section 303(d) list of impaired water bodies.

The City's existing wells obtain groundwater from deeper layers of the aquifers considered suitable for all uses and compliant with human health standards. The City routinely monitors untreated groundwater supplies for constituents regulated by human health standards including nitrate, fluoride, metals (i.e., arsenic, chromium, and selenium), and disinfection byproducts as well as constituents for consumer acceptance including salinity parameters (EC, chloride, sulfate, and total dissolved solids [TDS]), pH, and hardness (City of Brentwood 2014c). The groundwater exhibits a near-neutral range of pH (i.e., 6.5 to 7.5) and thus, is neither excessively acidic or alkaline.

Groundwater in the Brentwood region has relatively elevated salinity and total hardness levels, and is generally characterized as having calcium and sodium as the dominant cations and bicarbonate and chloride as the dominant anions (Lawrence Livermore National Laboratory 1995). Consequently, use of residential water softeners is prevalent in the City for hardness control. Through the increased use of Delta source waters for the municipal supply relative to groundwater use, the average hardness of delivered municipal water has decreased steadily in the past several years (City of Brentwood 2014c). The City is conducting outreach with information included in the annual Consumer Confidence reports (i.e., reports prepared annually that provide summarize potable water quality performance) to inform customers of the improved hardness conditions and reduced levels of water softening needed, and additionally is developing an incentive program for residents to remove softeners. Salinity in the Brentwood region, measured as EC, is usually between l,000 and 2,000 µS/cm. Conductivity is generally lower in easterly-located wells and higher in westerly- and centrally-located areas. Additionally, shallower groundwater wells in the region have been affected by overlying land use and agricultural activities over many years. Nitrate is elevated in some areas, and the City has discontinued using some wells due to excessive nitrate. Shallow groundwater also exhibits generally elevated salinity levels compared to deeper groundwater.

Regulatory Framework

Regulations, plans or policies relevant to the management of hydrology and water quality in the project area and considered in this evaluation include:

Federal Water Quality Regulations

The Clean Water Act (CWA) establishes the policies and procedures for protection of the nation's surface water resources and regulation of waste discharge activities. The law authorizes the U.S. Environmental Protection Agency (USEPA) to set standards (technology and water quality) and permitting procedures for point-source industrial and municipal wastewater discharge activities and municipal stormwater. The USEPA has delegated many of the permitting, administrative, and enforcement aspects of the CWA to the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (Regional Water Boards). In 2000, the USEPA promulgated the California Toxics Rule (CTR), which includes criteria for toxic pollutants that are applicable to California's surface waters. USEPA also sets National Recommended Water Quality Criteria which are advisory surface water criteria. The USEPA, under the Safe Drinking Water Act (SDWA), sets national drinking water standards, or maximum contaminant levels (MCLs), applicable to treated drinking water to protect against health risks considering available technology and costs. The owners and operators of public water systems are required to comply with primary (health-related) MCLs and encouraged to comply with secondary MCLs (i.e., for nuisance or aesthetic effects). The DDW oversees the SDWA regulations.

Section 303(d) of the CWA requires states to identify water bodies that will not attain water quality standards after implementation of minimum required levels of treatment by point-source dischargers. Section 303(d) requires states to develop a total maximum daily load (TMDL) and implementation program for listed pollutants and water bodies. A TMDL is the amount of loading that the water body can receive and still meet water quality standards.

State Water Quality Regulations

Under the Porter-Cologne Water Quality Control Act, the SWRCB (and nine Water Boards) must adopt water quality policies, plans, and objectives that ensure beneficial uses of surface and groundwater are reasonably protected. The SWRCB administers water rights, water pollution control, and water quality functions, while the Water Boards conduct planning, permitting, and enforcement activities. The Water Boards issue Waste Discharge Requirements (WDRs) for the discharge of wastes to land, and for discharges to surface waters and land. The Central Valley Water Board defines beneficial uses of water resources, water quality objectives, implementation programs, and related programs in the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (Basin Plan) (CVRWQCB 2011). The State's antidegradation policy (SWRCB Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality Waters in California) is to maintain high-quality waters where they exist in the state. The antidegradation policy requires protection of all existing beneficial uses that existed at the time of the policy adoption, and specifies that degradation of high quality water is only when

demonstrated that beneficial uses would not be unreasonably affected, and the highest quality water consistent with the maximum benefit to the state would be achieved.

The Basin Plan contains specific numeric water quality objectives for bacteria, dissolved oxygen, pH, pesticides, EC, TDS, temperature, turbidity, and some priority toxic pollutants (i.e., some trace metal and organic compounds), as well as narrative water quality objectives for several constituents. The drinking water MCLs also are identified as applicable ambient water quality objectives in Basin Plans to protect source water for supply uses (e.g., municipal/industrial/agricultural), particularly from constituents that water treatment systems are not typically designed to remove such as salinity and nitrate.

Recycled Water Regulations (SWRCB). Recycled water quality and reuse activities area regulated by the SWRCB's DDW. Statewide uniform recycled water quality criteria are established by DDW and specified in Title 22, Division 4, Chapter 3, section 60301 et. seq. of the California Code of Regulations (CCR). The Title 22 regulations set treatment process, treatment reliability, and recycled water reuse requirements for the protection of public health from pathogens. The existing Water Recycling Criteria address treatment requirements for three main types of recycled water uses: landscape irrigation, recreational impoundments, and industrial uses. The treatment requirements are based on the expected degree of human contact with recycled wastewater under each type of use. Recycled water criteria are most stringent for the uses that involve potential public contact, such as irrigation of food crops, parks, playgrounds, school yards, residential areas, cemeteries, and golf courses require recycled water at all times to be adequately oxidized, coagulated, clarified, filtered, and disinfected. Adequate disinfection, in this case, requires the number of coliform bacteria to not exceed a 7-day median value of 2.2 per 100 milliliters.

The SWRCB (and Regional Water Boards) are responsible for issuing water recycling requirements in accordance with the CWC, section 13523. The SWRCB adopted a Recycled Water Policy in 2009 and amended in January 2013 intended to facilitate and guide the increased use of recycled water from municipal wastewater sources, and thereby contribute to water conservation in California. In adopting the policy, the SWRCB declared, "*…recycled water is safe for approved uses, and strongly supports recycled water as a safe alternative to potable water for such approved uses…..*" when used in compliance with Title 22 requirements. The SWRCB additionally adopted General WDRs for Recycle Water Use (Order WQ 2014-0090-DWQ) in June 2014 to facilitate additional streamlining in the permitting process for recycled water projects. Among many standard permit terms and conditions in Order WQ 2014-0090-DWQ to ensure compliance with Title 22 regulations, the WDRs additionally require recycled water uses to be consistent with any Salt and Nutrient Management Plan adopted by a Regional Water Board for the area.

SWRCB Division of Water Rights. In addition to the authority for water quality protection, the SWRCB, Division of Water Rights has oversight over the appropriation and use of waters of the state, and responsibility to ensure that actions do not result in water waste or unreasonable effects to fish and wildlife. CWC Section 13550 states that the use of potable domestic water for non-potable uses (e.g., landscape irrigation, industrial uses) uses is a waste and unreasonable use of

water if recycled water is available that meets specified conditions of its use. Additionally, CWC section 1211 requires that changing the place or purpose of use of treated wastewater is subject to approval from the Division of Water Rights. In reviewing a petition for change in place or purpose of use, the SWRCB must consider and ensure that the effects of the change would not injure other downstream legal users of water, would not unreasonably harm instream uses, and would not be contrary to the public interest.

State Water Resources Control Board NPDES General Construction Storm Water Permit. The SWRCB adopted a general NPDES permit for storm water discharges associated with construction activity (Construction General Permit) in Order No. 2009-0009-DWQ (as amended by revised orders 2010-0014-DWQ and 2012-006-DWQ). The Construction General Permit applies to projects that involve soil disturbance of more than one acre, and includes specific requirements based on the "risk level" of the site. Three different risk levels are dependent on two factors: 1) project sediment runoff risk; and 2) receiving water risk. Obtaining coverage under the Construction General Permit requires filing of a Notice of Intent and preparing and implementing a storm water pollution prevention plan (SWPPP), which specifies best management practices (BMPs) to reduce or eliminate sediment and other pollutants in storm water as well as non-storm water discharges.

City of Brentwood General Plan

The Conservation and Open Space (COS) element of the General Plan addresses the protection of water resources in goal COS-4, as follows: *Protect and enhance water resources in local creeks, riparian habitat, wetlands, the Marsh Creek Watershed, and aquatic habitat*.

3.9.2 Discussion

a) This section addresses the potential for construction- and operations-related effects of the Proposed Project to adversely affect surface and groundwater quality via the exceedance of a water quality standard or a waste discharge requirement. A water quality standard has three components: 1) the designated beneficial use, 2) the water quality objectives/criteria adopted to protect the designated beneficial uses, and 3) an antidegradation policy. It should be noted that an exceedance of a water quality objective/criterion is but one of many considerations that go into determining whether a change in water quality would result in a significant environmental impact (i.e., adverse effect on the designated beneficial uses of a water body). For the purposes of this assessment, the frequency, magnitude, and geographic extent of any objective/criterion exceedance caused by the Proposed Project is evaluated to determine whether adverse effects to beneficial uses of the water would occur. If the Proposed Project would result in consistent compliance with applicable water quality objectives/criteria and beneficial uses would not be adversely affected by the Proposed Project, then it was determined that a significant water quality impact would not occur.

Construction-Related Water Quality Effects

Temporary construction activities for the Proposed Project would involve the pipeline alignments along Sand Creek Rd. and Fairview Ave., and the storage tanks at the WWTP

and RRPS sites. Construction activities for the Proposed Project would involve storage, handling, and use of construction materials (e.g., fuels, concrete, paints, cleaners and solvents) that may contain contaminants potentially harmful to water quality. Construction activities also would involve site grading, excavation, and facility construction activities that would occur over the course of approximately 8 to 12 months and, therefore, could be exposed to rainfall and runoff events. Exposure of construction activities and disturbed soil areas to rainfall and runoff can lead to soil erosion and discharge of construction-related contaminants. If shallow groundwater is present in the project area, excavations also may require temporary site dewatering and disposal to accommodate construction activities. Consequently, construction activities could result in the discharge of constituents of concern to receiving waters in the project area (e.g., Marsh Creek and other small streams and drainage channels). Aquatic life beneficial uses of surface waters would be the most sensitive beneficial uses of water to contaminants discharged from construction site runoff, which may include suspended sediment and turbidity, toxic organic compounds in petroleum products, and trace metals (e.g., copper, zinc). Therefore, the potential temporary construction-related water quality impacts of the proposed project would be potentially significant. With implementation of Mitigation Measure HWQ-1, this impact would be **less than significant**.

MITIGATION MEASURE HWQ-1. IMPLEMENT CONSTRUCTION BMPS FOR WATER QUALITY PROTECTION.

The City, or its designated general contractor, shall obtain authorization of project construction activities under the SWRCB's NPDES Construction General Permit (Order No. 2009-0009-DWQ/NPDES Permit No. CAS000002, and any applicable amendments), for any activities not subject to exemption from the permit. The Stormwater Pollution and Prevention Plan (SWPPP) prepared for permit will describe the BMPs that will be used to avoid and minimize potential construction-related contaminant discharges at construction sites. Compliance with this mitigation shall be included as a condition of the construction contract(s) between the City and applicable construction contractor(s), and as appropriate, shall additionally be included in final project designs and specifications that are prepared for the Proposed Project. The City will be responsible for ensuring that the construction is implemented in accordance with the Construction General Permit.

Operations-Related Water Quality Effects

Under the Proposed Project, the increased delivery and use of recycled water would replace a corresponding amount of the potable and non-potable water supplies currently used for landscape irrigation. Therefore, the potential operations-related water quality effects evaluated in this section address the seasonal reduction in effluent discharge to Marsh Creek, and the change in portions of the City's irrigation water supply from potable/non-potable water to recycled water. The analysis of effects is limited to Marsh Creek from the location of the WWTP effluent discharge outfall and extending downstream to the tidal zone at Big Break. Effects of Marsh Creek flows, and the Proposed Project, in Big Break and beyond in the Delta are considered minimal given that Marsh Creek flows are nearly

immeasurable relative to the average and daily tidal flow and exchange that occurs in the western Delta channels.

Operations-Related Effects of Reduced Effluent Discharge to Surface Water

A comparison of the existing water quality data available for constituents of concern in Marsh Creek and the WWTP effluent was conducted to assess the potential operations-related water quality changes in Marsh Creek that would result from the seasonally reduced effluent discharge rates. Where sufficient data were available, a mass balance analysis also was conducted to estimate the changes in downstream constituent concentrations. The beneficial uses designated for Marsh Creek in the Basin Plan are contact and non-contact water recreation, commercial and recreational fish and shellfish harvesting, warm freshwater aquatic life, preservation of rare, threatened or endangered species. Thus, water quality objectives for the protection of these uses were used for the effects assessment. Marsh Creek is not designated for municipal drinking water use, agriculture, or cold freshwater aquatic life beneficial uses. Therefore, no assessment of the effects to these uses was conducted with the exception that it is acknowledged that fall-run Chinook salmon, a coldwater species, enter and may make opportunistic use of Marsh Creek (i.e., when hydrology and water quality conditions are suitable for such use).

Monitoring data for constituents of concern in Marsh Creek and WWTP effluent samples were evaluated in relation to applicable water quality objectives including CTR criteria and Basin Plan objectives. Applicable USEPA-recommended criteria also were considered where adopted state water quality objectives/criteria do not exist (e.g., ammonia, aluminum) and where USEPA-recommended criteria are more specific and have a stronger scientific basis for use in assessing effects to beneficial uses compared to general Basin Plan objectives (e.g., dissolved oxygen). Constituents in Marsh Creek were evaluated for potential effects to beneficial uses if detected at least once above an applicable objective, based on past monitoring data. Potential changes in receiving water concentrations were assessed with respect to appropriate averaging periods upon which the objectives are based (i.e., the tolerance of aquatic life to concentration changes depend on the time period considered). Acute criteria are applicable to changes over a short time period (e.g., 1-hour) and chronic criteria are applicable to longer time periods (e.g., 4-day or 30-day average). Effects of the Proposed Project on water temperature are addressed entirely in Section 3.4 ("Biological Resources") because fisheries and other aquatic biological resources are the primary and most sensitive resource to temperature. Constituents not detected in Marsh Creek from past monitoring efforts (using appropriate analytical methods) were not assessed further because adverse effects would not be expected to occur when constituents are at such low levels (or not present).

Constituents detected, regardless of the concentrations, also were evaluated for the potential to reduce water quality downstream of the WWTP effluent discharge over the long-term (i.e., cause degradation of existing conditions). If the Proposed Project would not cause increases in constituent concentrations in surface water bodies by frequency, magnitude, and geographic extent that would adversely impact the water body's beneficial uses, and the

project would not cause substantial, long-term degradation of water quality, then it was determined that the Proposed Project would not result in a significant water quality impact.

Table 12 provides a summary of average and maximum concentrations for constituents detected in background Marsh Creek samples collected upstream of the WWTP effluent discharge location, corresponding effluent concentrations for theses constituents, and the applicable water quality objectives for the protection of aquatic life that were used for the assessment. Also shown are the estimated existing constituent concentrations downstream of the effluent discharge based on a mass-balance analysis of monthly average flows and concentrations, and the projected future downstream concentrations following implementation of the Proposed Project.

Table 12. Water Quality Objectives and Existing and Projected Constituent Concentrations Downstream of the WWTP Discharge.

Constituent	Units	Lowest Aquatic Life Objective[1]	Effluent Concentration		Upstream Marsh Creek Concentration		Estimated Average Downstream Receiving Water Concentration [3]		
			Mean [2]	Max	Mean [2]	Max	Existing	Proposed Project	Change
Arsenic	µg/L	150	2 [12]	3.0	3.0	4.3	2.4	3.0	0.7
Cadmium	µg/L	3.5	0.2 [13]	ND	0.04 [12]	0.05	0.1	0.04	(0.1)
Chromium (III)	µg/L	299	1 [12]	3	1.4	3.3	1.1	1.4	0.3
Copper	µg/L	10 [4] / 21.4	6.0	11.2	5.6	20.0	5.9	5.6	(0.2)
Lead	µg/L	5.6	0.2 [12]	0.70	0.51	0.90	0.3	0.5	0.2
Mercury	µg/L	- -[5]	0.0006	0.0011	0.0056	0.0203	0.0023	0.0056	0.0033
Nickel	µg/L	76	1 [12]	2	7.2	12	4.1	7.2	3.1
Selenium	µg/L	5	1.4	2.4	3.1	4.5	2.0	3.1	1.1
Zinc	µg/L	176	55 [12]	60	16	41	42	16	(26)
Aluminum	µg/L	750/ 3,195 [6]	16	60	496	1,530	179	496	316
Ammonia (as N)	mg/L	0.78/2.0 [7]	0.15	1.98	0.36	0.62	0.22	0.36	0.14
Chloride	mg/L	350 [8]	378	442	182	330	312	182	(129)
Dissolved Oxygen	mg/L	5 [9]	7.7	n/a	2.9	n/a	6.0	2.8	(3.2)
Nitrate (as N)	mg/L	- - [10]	9.2	12.9	1.3	2.7	6.5	1.3	(5.2)
pH	Std.	>6.5 to <8.5 [4]	7.6	8.0	7.7	8.4	7.6	7.7	0.1
Phosphorus, Total (as P)	mg/L	- - [10]	1.8	3.3	0.6	1.7	1.4	0.6	(0.8)
Turbidity	NTU	50 [11] / <20% change [4]	0.2	1.9	12.3	37	4.3	12.3	186%

Notes:
mg/L = milligrams per liter; µg/L = micrograms per liter; Std. = standard pH units; NTU – nephelometric turbidity units
1 Water quality objective is CTR chronic criterion, or with CTR acute criterion as "chronic / acute", unless otherwise noted. Hardness-dependent trace metal CTR criteria based on lowest Marsh Creek total hardness concentration of 157 mg/L as $CaCO_3$.

2 Mean concentration reported unless otherwise noted.
3 Mass-balance estimate of constituent concentrations downstream of the WWTP under existing and Proposed Project conditions. Analysis based on average effluent concentrations for 3-year period of record (Nov. 2011 through Oct. 2014) and average Marsh Creek concentrations from the 2002/2003 and 2011 special studies and routine monthly monitoring during Nov. 2011-Oct. 2014. Mass balance based on projected minimum monthly average effluent discharge rate in 2017, and minimum monthly average Marsh Creek streamflow in July-August for period of USGS gauge records (2001-2013). Changes in parentheses represent reduction in constituent concentration downstream of the WWTP effluent discharge.
4 Basin Plan objective.
5 No applicable aquatic life objective for total mercury exists. Marsh Creek is listed as impaired for mercury for potential concern of bioaccumulation in biological food chain and humans, and thus evaluated qualitatively.
6 No aquatic life objectives have been adopted in California. Chronic and acute total aluminum criteria as reported in the Arid West Water Quality Research Project, Evaluation of the USEPA Recalculation Procedure in the Arid West, Technical Report (Parametrix et al. 2006) for water hardness of 150 mg/L as $CaCO_3$.
7 Ammonia criteria based on USEPA criteria published in 2013 and identified as "chronic/acute". Lowest 30-day chronic criterion calculated from 30-day moving average of paired receiving water pH and temperature. Lowest acute criterion calculated from paired daily pH and temperature.
8 USEPA hardness- and sulfate-dependent criteria equation for chloride as cited in City of Brentwood NPDES permit and calculated based on the minimum Marsh Creek hardness (157 mg/L as $CaCO_3$) and sulfate (130 mg/l as SO_4) concentrations measured in the 2002/2003 and 2011 studies.
9 The Basin Plan specifies the objective for DO as 5 mg/L for waters within the legal boundary of the Delta… "except for those bodies of water which are constructed for special purposes and from which fish have been excluded or where the fishery is not important as a beneficial use." USEPA national recommended dissolved oxygen criteria are variable based on aquatic life stages to be protected and exposure period.
10 Numerical aquatic life criteria for nitrate and phosphorus do not exist. The Basin Plan narrative objective for nutrients states, "*Water shall not contain biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses*."
11 Bain Plan turbidity objective for the Delta is 50 NTUs; Basin Plan objective for waters with background between 5 and 50 NTU is specified as an allowable change of up to 20%.
12 Insufficient data to calculate mean concentration; value reported as median concentration.
13 Constituent not detected in effluent; mean and maximum values reported as "< detection limit" and detection limit used for mass balance calculation.

The average constituent concentrations for the period of record are used for the mass balance analysis that reflect the averaging period of concern for chronic effects to aquatic life (i.e., the lowest applicable water quality objectives for Marsh Creek for the constituents assessed). The mass balance analysis of existing conditions is based on average monthly effluent discharges in 2013, and the Proposed Project conditions are based on anticipated 2017 effluent discharge rates and irrigation demands when the recycled water facilities are constructed and operational. The monthly average Marsh Creek streamflow measured upstream of the WWTP, and existing and future effluent discharge rates and calculated streamflow downstream of the WWTP with the effluent contribution are tabulated in **Table 13**. The existing and projected effluent discharge and streamflow rates shown in Table 13 reflect the seasonal increase in recycled water use during summer months, and corresponding reduction in effluent discharge and Marsh Creek streamflow under the Proposed Project. The Proposed Project concentrations and estimated changes from existing conditions are shown for the low monthly average Marsh Creek streamflow rate of 0.4 MGD (equivalent to 0.6 CFS) observed in August 2013, which is the lowest monthly

streamflow rate observed during the 2000 through 2013 period of available USGS gauge data.

The constituent concentration data tabulated in Table 12 indicate that the average concentrations of several constituents in Marsh Creek are higher than effluent concentrations, and thus the average concentrations downstream of the WWTP would increase under the Proposed Project. The effects to beneficial uses resulting from the increased concentrations downstream of the WWTP are described in detail below under checklist item "(f)".

Table 13. Average Monthly Effluent Discharge (MGD) and Marsh Creek Streamflow (MGD) Under Existing Conditions and the Proposed Project Conditions.

Scenario	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Existing Effluent Flow (2013)	3.3	3.4	3.4	3.4	3.1	3.2	3.1	3.2	3.2	3.3	3.5	3.5
Projected Effluent Flow (2017) Without Project	3.7	3.8	3.8	3.8	3.5	3.6	3.5	3.6	3.6	3.7	3.9	3.9
Projected Effluent Flow (2017) With Project	3.4	3.4	2.9	1.6	0.3	0.0	0.0	0.2	2.5	2.7	3.3	3.6
Monthly Average RSW-001 Flow (2000-2013)	13.5	11.6	12.6	9.2	3.2	2.4	1.8	2.0	1.8	2.4	2.2	11.7
Minimum Monthly Average RSW-001 Flow (2000-2013)	0.7	0.7	0.6	1.1	0.4	0.5	0.5	0.4	0.5	0.6	0.3	0.2
Existing Monthly Average RSW-002 Flow	16.9	15.0	16.0	12.6	6.4	5.6	4.9	5.3	5.0	5.7	5.7	15.2
Existing Minimum Monthly Average RSW-002 Flow	4.1	4.1	4.0	4.5	3.5	3.7	3.6	3.7	3.7	3.9	3.8	3.8
Projected Monthly Average RSW-002 Flow	17.0	15.0	15.5	10.7	3.5	2.5	1.8	2.2	4.3	5.2	5.6	15.3
Projected Minimum Monthly Average RSW-002 Flow	4.2	4.1	3.5	2.6	0.7	0.6	0.5	0.6	3.0	3.4	3.7	3.8

Nutrients (Nitrogen Compounds and Total Phosphorus): Numerical water quality objectives for the protection of aquatic life have not been adopted for constituents that can contribute to biostimulation of primary production (i.e., aquatic algae and bacteria, aquatic vascular plants). Major plant nutrients include nitrogen compounds (e.g., ammonia, nitrate) and phosphorus, and there are many constituents that are micronutrients for primary producers (e.g., silica). The Basin Plan contains a narrative objective that states, "Water shall not contain biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses." The available monitoring data presented in Table 12 indicate that the average ammonia concentration is higher in Marsh Creek than in the effluent, and the average nitrate and total phosphorus concentrations are lower in Marsh Creek. Consequently, the average nitrate and total phosphorus concentrations in Marsh Creek downstream of the WWTP would be reduced under the Proposed Project as a result of the seasonally reduced effluent discharge, and average ammonia would increase slightly. However, the Proposed Project would not result in an increased potential to stimulate nuisance plant and algae growth downstream of the

WWTP, due to the substantially reduced nitrate and total phosphorus concentrations compared to the slight ammonia increase. Therefore, there would be **no impact** associated with the Proposed Project's effect on nutrient levels in Marsh Creek.

Mercury: Average total mercury concentrations are higher in Marsh Creek than in the effluent. Consequently, the reduced effluent discharge under the Proposed Project would result in slightly higher instream concentrations of mercury downstream of the WWTP on a seasonal basis. Mercury is present in the Marsh Creek watershed as a result of historic mining activity for mercury in the upper watershed. The potential concern for mercury is bioaccumulation through the lower trophic levels of the aquatic food chain, upward to higher trophic levels of fish, birds, terrestrial wildlife and humans, where adverse toxicological effects in wildlife may occur and increase the risk of health effects in people that consume organisms with accumulated mercury. However, the minor increases in Marsh Creek mercury concentrations downstream of the WWTP would not substantially affect the potential bioaccumulation of mercury in the food chain. The seasonal and temporary increases in downstream mercury concentrations (i.e., primarily the low flow months of July and August) reflect a minor change relative to the majority of each year when concentrations would remain similar to existing conditions. Moreover, the approximately 3.0 mile long channel reach downstream of the WWTP with elevated concentrations would reflect a relatively small area compared to the total upper Marsh Creek watershed and Delta areas downstream of the WWTP where mercury and organisms exists. Consequently, no substantial change in the bioaccumulation of mercury in the food chain would be expected to occur. Therefore, the Proposed Project would not be anticipated to cause or contribute to measurably increased tissue levels of mercury in aquatic organisms, or to substantially increase ecological or human health risks. Therefore, the potential long-term operations-related impact of the Proposed Project on mercury levels would **be less than significant.**

Turbidity: The monitoring data tabulated in Table 12 indicate that the average turbidity concentration in Marsh Creek upstream of the WWTP is higher than the effluent. The treatment processes of the WWTP include settling, clarification, and filtration of suspended solids, thus producing effluent with consistently low turbidity levels compared to the variable turbidity conditions of Marsh Creek. Consequently, under existing conditions, the effluent discharge generally results in lower turbidity levels downstream of the WWTP compared to the upstream area of Marsh Creek. Accordingly, with implementation of the Proposed Project, the seasonal reduction in effluent discharge during the low flow months of July and August would result in a nearly doubling of turbidity concentrations downstream of the WWTP relative to the existing conditions. The Basin Plan objective limits the allowable turbidity increase to less than 20% above background levels. However, Marsh Creek supports only warmwater species during the mid-summer months when the greatest reduction in effluent discharge would occur under the Proposed Project. As described in detail in Section 3.5 (Biological Resources), native and introduced warmwater fish species that occur year-round in lower Marsh Creek include native minnows (California roach, common carp, hitch, and Sacramento pikeminnow), introduced Centrarchids (bluegill, green sunfish, and largemouth bass), native threespine stickleback, native Sacramento sucker, and introduced western mosquitofish.

A technical review of turbidity and total suspended solids (TSS) objectives for an amendment to the Basin Plan cited work by the European Inland Fisheries Advisory Committee (EIFAC) in 1965, and reaffirmed by the National Academy of Sciences (NAS) in 1972, that concluded waters with TSS concentrations less than 25 mg/L provide a high level of protection for fish, and water with TSS levels less than 80 mg/L provide a moderate level of protection (CVRWQCB 2007). The relationship of TSS to turbidity is variable and site-specific, however is generally in the range or 2:1 to 1:1. Assuming a conservative ratio of 2:1, the EIFAC/NAS findings indicate that turbidity between 12-40 NTUs are protective of fish. As indicated in the mass balance analysis, turbidity would increase by an average of 8 NTU in lower Marsh Creek downstream of the WWTP with the Proposed Project. Therefore, the projected small increase in average turbidity levels downstream of the WWTP would not be of sufficient magnitude to result in adverse effects to the warmwater fish community. Therefore, the potential long-term operations-related impact of the Proposed Project on lower Marsh Creek turbidity would be **less than significant**.

Dissolved Oxygen (DO): Similar to turbidity, average DO concentrations in Marsh Creek upstream of the WWTP are lower than the effluent during the mid-summer period. Moreover, the average DO concentrations measured in Marsh Creek upstream of the WWTP during July and August are below the Basin Plan objective of 5 mg/L. Average effluent DO concentrations in July and August are above 7.5 mg/L. The DO monitoring is collected by WWTP staff, pursuant to the NPDES permit requirements, as single weekly grab samples. Consequently, the mass balance analysis in Table 7 indicates that the seasonal reduction in effluent discharge during July and August would lower DO concentrations downstream of the WWTP, relative to the existing conditions. With regard to the warmwater fish community of Marsh Creek, the USEPA recommended warmwater criteria for DO (USEPA 1986) shown in **Table 14** are more scientifically refined and representative of potential effects to fish than the Basin Plan objective. The mass balance analysis indicates that under the Proposed Project conditions, DO concentrations in Marsh Creek upstream and downstream of the WWTP may be low compared to the USEPA objectives for some of the life stages and averaging periods.

Table 14. USEPA-Recommended Ambient Water Quality Criteria for Dissolved Oxygen.

Parameter	Warmwater DO Criteria (mg/L)	
	Early Life Stages[1]	Other Life Stages
30-Day Mean	NA	5.5
7-Day Mean	6.0	NA
7-Day Mean Minimum	NA	4.0
1-Day Minimum [2,3]	5.0	3.0

NA = not applicable

1 Includes all embryonic and larval stages and all juvenile forms to 30 days following hatching.

2 For highly manipulable discharges, further restrictions apply (see pg. 37 of USEPA 1986).

3 All minima should be considered as instantaneous concentrations to be achieved at all times.

There is considerable uncertainty in the potential for adverse effects to actually occur to the resident fish community as a result of projected DO reductions in Marsh Creek downstream of the WWTP during July and August. Although the mass-balance analysis performed works well for many conserved parameters, it does not work well (i.e., does not accurately predict DO levels downstream of the WWTP outfall) because DO is not a conservative parameter, and is being produced and consumed in every reach of the creek. Moreover, channel gradient, creek depth, turbulence all affect reach-specific re-aeration of creek water. In addition, because DO fluctuates on a diurnal basis, with higher levels in the daylight when algae and plants are producing oxygen, and lower levels at night when plants are respiring, the weekly grab samples may not accurately represent the actual average DO concentrations available to fish. Moreover, field surveys in Marsh Creek conducted in recent years for compliance studies required under the City's NPDES permit indicate that diversity and abundance of the fish community is robust upstream of the WWTP. The resident fish community in Marsh Creek upstream and downstream of the WWTP consists of the same species that are adapted to living in the warmwater conditions. Consequently, the seasonal and temporary reduction in effluent discharge and resulting reduction in average DO concentrations during July and August downstream of the outfall would not necessarily adversely affect the fish community. However, based on the available data, the potential for reduced DO concentrations downstream of the WWTP to adversely affect resident fish is considered a **potentially significant impact**. Implementation of Mitigation Measure HWQ-2 would reduce this impact to a less-than-significant level.

MITIGATION MEASURE HWQ-2. DISSOLVED OXYGEN EVALUATION AND CONTROL MEASURES.

Upon initiation of increased recycled water deliveries for the Proposed Project, the City shall evaluate Marsh Creek for adverse DO-related effects to the fish community, and implement control measures, if necessary. During periods when recycled water is being distributed from the WWTP during the mid-summer months (i.e., July and August), and background Marsh Creek streamflow levels are low, the City will monitor receiving water DO to determine whether DO falls to levels that may result in adverse effects to fish and invertebrates within lower Marsh Creek. If potentially adverse DO levels are observed from monitoring, the City will implement fish and invertebrate surveys upstream and downstream of the WWTP discharge to determine whether actual adverse effects (e.g., reduced species diversity, change in expected community structure, loss of sensitive organisms) are occurring. Should adverse effect be identified through field surveys that are determined to be attributable to the reduced effluent discharge, the City shall implement corrective measures to substantially reduce or eliminate the adverse effects. Such corrective measures include, but may not be limited to, reducing the amount of water used for recycled water irrigation.

Operations-Related Groundwater Effects of Recycled Water Irrigation

Under the Proposed Project, the increased delivery and use of recycled water would replace a corresponding amount of the potable and non-potable water sources currently used by City

customers for landscape irrigation. The Proposed Project would not involve any direct effects to groundwater such as changes in recharge or well uses; therefore, no appreciable changes in groundwater hydrology related to storage or flow conditions compared to existing conditions would be anticipated to occur. Additionally, the City's WWTP produces recycled water that meets the Title 22 tertiary treatment and disinfection requirements, and thus is compliant with the most stringent water quality regulations for unrestricted reuse activities with a potential for indirect contact by the general public. The irrigation customers that receive recycled water, would be required to comply with the City and DDW requirements for use of the recycled water such as control of runoff, overspray and wind drift, and cross connection and backflow controls to prevent inadvertent mixing of recycled water into the potable supplies that may be used for activities with potential for ingestion (e.g., drinking water, swimming pools). Consequently, it is assumed for the purposes of this assessment that the increased recycled water irrigation use under the Proposed Project would be conducted in accordance with regulatory requirements and there would not be any potential for substantial adverse human health effects from direct exposure to recycled water.

Accordingly, the assessment of potential operations-related groundwater quality effects was focused on the potential discharge of constituents of concern in recycled water, associated infiltration into soils at irrigation sites, and related changes to underlying groundwater quality. The assessment primarily considers differences in the chemical composition of the recycled water and existing groundwater resources. The beneficial uses of groundwater designated in the Basin Plan are municipal, industrial, and agricultural water supply. Therefore, the state drinking water MCLs were used in the assessment for evaluating potential adverse effects and human health risk of any project-related changes in groundwater quality.

The City-compiled water quality monitoring data reported in annual Consumer Confidence Reports were reviewed and used for the mass balance analysis. City data is reported for the operational municipal groundwater wells, Brentwood WTP, and purchased water from the Randall-Bold (RB) WTP which is owned by the Contra Costa Water District. The monitoring data indicate that no constituents of concern are detected at average concentrations that exceed applicable MCLs. However, as described above, salinity and total hardness levels in groundwater in the project area are known to generally be elevated. Available monitoring data for salinity parameters, as reported in the City's most recent report for 2013, are tabulated in **Table 15** (City of Brentwood 2014c), along with corresponding values in the recycled water.

Salinity reflects the total mineral content in water and is primarily composed of inorganic cations and anions (i.e., calcium, magnesium, potassium, sodium, bicarbonate, chloride and sulfate), and dissolved organic matter generally contributes very little salinity in water. Salinity is not a human health concern, but elevated salinity can cause water to taste salty and be detrimental for irrigation of salt-sensitive plants. Many of the inorganic ions comprising salinity are soluble and chemically conservative (i.e., not likely to be assimilated by plants or adsorbed to soil) and, as a result of evapotranspiration, they either accumulate

in the soil layer or pass beyond the root zone at higher concentrations than in the applied water. The data indicate that average constituent concentrations in the potable water (i.e., produced from surface water diversions in the Delta) and City groundwater wells are lower than applicable drinking water MCLs. The recycled water has elevated levels of total dissolved solids (TDS) and electrical conductivity (EC) that are present at slightly higher concentrations than the MCLs.

Table 15. Average Constituent Concentrations in Existing Irrigation Water Supplies and Estimated Flow-Weighted Concentrations of Irrigation Supply.

Constituent	Units	Lowest Drinking Water Criterion [1]	2013 Average Concentration [2]				Flow-Weighted Concentrations in Applied Irrigation Water [3]		
			City Wells	City WTP	RB WTP	RW	Existing	Proposed Project	% Change
Chloride	mg/L	500	168	110	65	378	114	132	15.8%
EC	µS/cm	1600	1293	605	464	1925	645	732	13.5%
Sulfate	mg/L	500	201	56	51	208	64	74	15.3%
TDS	mg/L	1000	823	314	248	1072	343	393	14.5%

Notes:
RW = recycled water; µS/cm = micro Siemens per centimeter
1 Primary and secondary MCLs.
2 Average concentrations reported in City of Brentwood 2013 Consumer Confidence Report.
3 Flow weighted concentration of applied irrigation water assuming City's irrigation supply is 27% of total surface and groundwater deliveries. Calculation includes ECCID's surface water deliveries in the Brentwood region.

The potential groundwater quality effects of the discharge of salinity constituents was assessed with a mass balance analysis to estimate the existing average salinity concentration of the irrigation water supply used by the City. The estimated average irrigation supply salinity under the Proposed Project was then compared to existing irrigation supply salinity as a direct indicator of the potential change that could occur to groundwater quality, because all other factors would be the same between these two scenarios (i.e., demand, supply, rainfall, etc.). The current total irrigation water use in the City for landscape irrigation is estimated to be approximately 27% of the annual potable and non-potable deliveries (City of Brentwood 2011), or about 3,240 AFY of the total deliveries of approximately 13,000 AFY in 2013. The City also delivers about 196 AFY of recycled water currently, and ECCID delivers about 23,500 AFY of raw water to the region. The mass balance analysis for the Proposed Project was based on the additional use of 1,750 AFY of recycled water, and an assumed corresponding reduction in purchased and treated potable water (i.e., the City's current use rate for groundwater was not reduced).

The flow-weighted average concentrations for the salinity parameters in the blend of City water supplies are shown in Table 15 for the existing conditions, and for the Proposed Project scenario with increased recycled water use. The analysis shows that the flow-weighted average concentrations are lower than the MCLs under existing conditions. The increased recycled water use under the Proposed Project would increase the average constituent concentrations in the irrigation supply by up to about 13-16% relative to the

existing conditions, and supply water concentrations would remain below the applicable MCLs. Therefore, the Proposed Project could result in increased salinity levels in the groundwater relative to existing conditions. However, operations-related changes would not be expected to substantially increase groundwater salinity levels such that MCLs would be exceeded at a substantially increased magnitude, frequency, or geographic extent that would adversely affect beneficial uses. Therefore, the operations-related groundwater quality impacts are considered to be **less than significant**.

b) Groundwater recharge is dependent on the permeability of soils and amount of recharge that occurs. The Proposed Project involves construction activity on approximately 3 acres of existing earthen areas to erect the two storage tanks, which would result in an incremental, and nearly immeasurable amount of additional impermeable surfaces in the project area. New impermeable surfaces may reduce the potential for groundwater recharge at a site. However, the construction areas are small relative to the Brentwood area and available region-wide groundwater recharge areas. Pipeline construction activities would not change groundwater recharge because the work area would be restored to original condition when construction is complete. Therefore, the minor potential reduction in groundwater recharge as a result of the Proposed Project would not measurably affect groundwater hydrology. Therefore, this impact would be **less than significant**.

(c-e) Neither the construction or operations of the Proposed Project would substantially alter the existing drainage patterns and there would be no changes made to any constructed stormwater drainage systems or natural stream channels. The new recycled water pipeline routes would be located primarily within existing roadways. It is anticipated that existing pipeline would be used at the stream and drainage channel crossings that occur along the pipeline alignment. If any new crossing of a stream is needed, it is anticipated that the new pipe would be attached to existing bridge spans or installed by boring underneath the channel. Therefore, the Proposed Project would not affect flows in any drainage or stream channel. The total area of new impervious surfaces constructed in the form of the storage tanks and adjacent paved access would be approximately 3 acres, and stormwater drainage and runoff from these surfaces would be incorporated into the final landscaping designs for the sites to ensure that site drainage is appropriately conveyed to a drainage system. Potential erosion associated with drainage areas also would be considered through the final project design phases, and thus the small additional areas of potential runoff would not substantially contribute additional runoff that would result in substantial change in erosion or siltation rates compared to existing conditions. Therefore, this impact would be **less than significant**.

f) The assessment of the potential for the Proposed Project and increased recycled water use to cause or contribute to degradation of surface water or groundwater quality was conducted with consideration of the antidegradation policy and the SWRCB's findings in the adoption of the General WDRs for Recycled Water Use (WQ 2014-0090-DWQ) adopted in June 2014.

The mass loading analysis of potential project-related water quality effects in Marsh Creek in Table 12 indicate that average constituent concentrations of arsenic, chromium, lead, mercury, nickel, selenium, aluminum, ammonia, and turbidity are slightly higher in Marsh Creek than in the effluent. Therefore, the reduced effluent discharge under the Proposed Project would result in slightly higher concentrations of these constituents downstream of the WWTP relative to existing conditions. However, the average Marsh Creek concentrations downstream of the WWTP for all of these constituents would remain well below their respective water quality objectives. Therefore, the Proposed Project would not substantially increase the risk of water quality objectives being exceeded. Marsh Creek would retain a large amount of the available assimilative capacity for any other future constituent loading from unforeseen sources. Thus, available assimilative capacity in Marsh Creek would not be substantially reduced under the Proposed Project.

The mass balance analysis indicates that average salinity constituent concentrations in the irrigation water supply would increase by up to about 13-16% with the implementation of the Proposed Project (depending on the constituent). Therefore, the increased recycled water use may result in incremental increases in groundwater salinity concentrations. However, groundwater quality depends on many factors beyond the effect of added constituent loading from the Proposed Project. It is generally recognized that the predominantly irrigated agricultural land uses that existed in the Brentwood area prior to the extensive urbanization beginning in the 1990's was a substantial contributor of constituents to groundwater, and urbanization is expected to substantially reduce constituent loading (Lawrence Livermore Laboratory 1995). Consequently, the current balance of salinity loading and attenuation in the groundwater, while uncertain given the lack of comprehensive data, is expected to generally be lower than in the past. Consequently, the Proposed Project would not be expected to substantially increase groundwater salinity levels or the risk of exceeding objectives or adversely affect beneficial uses.

With the City's construction of the Brentwood Water Treatment Plant (WTP) in 2008, the relative amount of surface water has increased and groundwater use has decreased. Consequently, the total hardness of delivered water has decreased and the City is promoting the reduced use of water softeners by customers to reduce the salt brine discharges to the sewer system. The City also is developing a water softener buy-back program to further reduce brine discharges. With the continued increased use of low-salinity surface water with City population growth, and reduced water softener brine discharges, the salinity levels in the recycled water and potable water supplies should decrease over time. Therefore, the potential for salinity degradation under the Proposed Project, if at all, would not be of sufficient magnitude such that exceedances of MCLs would be likely, or result in substantially increased risk for adverse effects to the municipal beneficial uses. Moreover, the City's WWTP produces recycled water that fully complies with the Title 22 tertiary treatment and disinfection requirements for reuse, which is consistent with the state antidegradation policy to provide best practical treatment and control (BPTC).

Additionally, municipal recycled water may contain constituents not present in the native groundwater or potable water supplies, or at generally higher concentrations, such as

pathogens, nitrate, phosphorus, trace metals, organic carbon, residual chlorine, and disinfection byproducts such as trihalomethane compounds (THMs). Recycled water also may contain constituents of emerging concern (CECs) in domestic wastewater such as pharmaceutical products (e.g., antibiotics, natural and synthetic hormones), alkylphenols and alkylphenol ethoxylates, polybrominated diphenyl ether (PBDE) flame-retardant chemicals, phthalates, and nitrosamines. No applicable federal water quality criteria or state objectives have been adopted or recommended for most of the CECs, and it may be many years before regulatory objectives are developed, or the Central Valley Water Board establishes effluent limitations for wastewater. However, the majority of these compounds are not chemically conservative; therefore, natural processes such as biological uptake by plants and soil microbes, photo-degradation, evaporation and volatization, adsorption to surface soils and organic matter, and physical filtration in the topsoil and deeper soil layers would reduce CEC concentrations in any water that infiltrates to groundwater. Additionally, recycled water requirements of the Central Valley Water Board and state recycled water policies require irrigation to be conducted at agronomic rates to match the plant water demands, and thus minimize excessive irrigation and infiltration of water into the soil past the root zone. Therefore, the discharge of these constituents in recycled water would not be expected to result in any substantial adverse effects to groundwater quality or beneficial uses. Therefore, this impact is **less than significant**.

(g-i) The Proposed Project would not involve the placement of structures within a 100-year flood hazard area. The proposed recycled water pipelines would cross several streams and drainage ways, but the proposed plan is to utilize and repurpose pipelines that already exist at these crossings. Therefore, the Proposed Project is not anticipated to adversely affect flooding, flood exposure, or impede or redirect flood flows. Therefore, there would be **no impact.**

j) The project area is not subject to exposure to seiche or tsunami. Therefore, there would be **no impact.**

3.10 LAND USE AND PLANNING

	Would the project…	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant Impact	No Impact
a)	Physically divide an established community?	☐	☐	☐	☑
b)	Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☑
c)	Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☑

3.10.1 Setting

The WWTP site, RRPS site, and all roadways where the recycled water pipelines would be constructed are designated in the General Plan as public facilities. The City and all areas potentially affected by implementation of the Proposed Project are located within the East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan (ECCCHCP) area, which is discussed in detail in Section 3.4 ("Biological Resources").

3.10.2 Discussion

a, b) The Proposed Project involves temporary construction activities for the recycled water pipelines and storage tanks on sites currently zoned for public facilities. Thus, the Proposed Project would not involve any land use changes and no communities would be physically divided. Therefore, no conflict with the existing land use designations would occur. Therefore, there would be **no impact**.

c) As described in Section 3.5, "Biological Resources," the City would coordinate with the Habitat Conservancy office and participate in the ECCCHCP accordingly. Therefore, the Proposed Project would not conflict with the ECCCHCP requirements. Therefore, there would be **no impact**.

3.11 MINERAL RESOURCES

	Would the project…	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant Impact	No Impact
a)	Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☑
b)	Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☑

3.11.1 Setting

The City of Brentwood General Plan identifies coal, oil and gas, and sand as significant mineral resources within the area (City of Brentwood 2014a). The proposed areas where construction activities would occur are not sites used for mineral resource extraction.

3.11.2 Discussion

a,b) The Proposed Project would not involve temporary construction-related activities or any permanent facilities in an area used for mineral extraction. Neither the temporary construction activities or long-term increased use of recycled water in the City would result in the loss of any mineral resources. Therefore, there would be **no impact.**

3.12 NOISE

	Would the project…	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant Impact	No Impact
a)	Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☑	☐	☐
b)	Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☑	☐
c)	A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☑	☐
d)	A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☑	☐	☐
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☑
f)	For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☑

3.12.1 Setting

Sound is mechanical energy transmitted in the form of a pressure wave from a disturbance or vibration. Noise, is generally defined as sound that is loud, unpleasant, unexpected, or disagreeable. The human ear is sensitive to a wide range of sound pressure fluctuations. Sound pressure levels are expressed in logarithmic units called decibels. Because the human ear is not equally sensitive to all sound frequencies, a "dBA" frequency-dependent rating scale is used to reflect the range of sensitivity for the average human ear from the faintest sound audible to the maximum sensitivity. Based on the dBA scale, a10 dBA increase is perceived by the average human ear as a doubling of the loudness, thus a 70dBA sound is twice as loud as a 60 dBA sound. Negative effects of noise exposure include nuisance effects (e.g., annoyance, sleep disturbance) to physical damage to the human auditory system. Physical damage to the auditory system may lead to gradual or traumatic hearing loss.

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal and is a measure typically used to describe potential vibration effects to buildings. The root mean square amplitude is most frequently used to describe the affect of vibration on the human body. The effects of ground vibration can vary from no perceptible effects at the lowest levels, low rumbling sounds and detectable vibrations at moderate levels, up to causing building damage at the highest levels. Damage to structures from vibration is primarily architectural (e.g., loosening and cracking of

plaster or stucco coatings) and rarely result in structural damage. Ground vibration generated by construction equipment spreads through the ground and diminishes in strength with distance.

The dBA scale is used for purposes of environmental noise assessment and regulation. The Noise Element of the City's General Plan specifies noise criteria for evaluating the compatibility of individual land uses with respect to long-term ambient noise exposure (City of Brentwood 2014b). The City controls construction-generated noise levels through implementation of the Municipal Code which limits outside heavy equipment activities on Monday through Friday to the hours between 8:00 a.m. and 5:00 p.m., on Saturday between 9:00 a.m. and 4:00 p.m., and no construction on Sundays and City holidays. The City Municipal Code restricts outside carpentry construction on Monday through Friday to the hours between 7:00 a.m. and 7:00 p.m., on Saturday to the hours between 9:00 a.m. and 5:00 p.m. and no construction on Sundays and City holidays.

There are no federal, state, or local regulatory standards for vibration. However, Caltrans has developed vibration criteria based on human perception and structural damage risks (Caltrans 2002). For most structures, Caltrans considers a PPV threshold of 0.2 inches per second (in/sec) to be the level at which architectural damage (i.e., minor cracking of plaster walls and ceilings) to normal structures may occur. Below 0.10 in/sec there is "virtually no risk of 'architectural' damage to normal buildings. Levels above 0.4 in/sec may possibly cause structural damage. Continuous vibrations in excess of 0.1 in/sec ppv are identified by Caltrans as the minimum level perceptible level for ground vibration. Short periods of ground vibration in excess of 0.2 in/sec can be expected to result in increased levels of annoyance to people within buildings.

Sensitive receptors to noise and ground vibration in the project area primarily consist of the residential and commercial areas adjacent to the Sand Creek Rd. and Fairview Ave. pipeline alignments, and residential neighborhoods surrounding the RRPS site. There are no schools or hospitals located near the zones of proposed construction activities.

3.12.2 Discussion

a, d) The Proposed Project would involve temporary construction activities for the recycled water pipeline alignments and the recycled water storage tank sites. The WWTP site is located a considerable difference from any sensitive receptors, and therefore construction would not be anticipated to result in any substantial adverse noise effects near the WWTP. The operations-related noise effects associated with the Proposed Project would be associated with the additional stationary recycled water pumps to be installed at the WWTP. However, the additional pumps reflect a minor change to the existing WWTP facilities and would not contribute substantially to noise levels. There would be no change in employees for the City to implement the Proposed Project, and noise associated with mobile sources associated with long-term operations and maintenance of the Proposed Project would be minimal.

Construction activities have the potential to occur within relatively close distance (i.e., 50-100 feet) of sensitive receptors to noise such as residential and commercial areas adjacent to

the pipeline alignments and the RRPS site. Construction noise would be associated with grading, excavation, material and waste hauling trips, paving, and other heavy equipment use. Pipelines would generally be installed in short segments over a few days, and exposure to noises would occur during those short periods. Noise would be generated at the storage tank construction sites over longer periods (i.e., up to about 120 days).

Without noise control measures, the maximum noise levels from construction equipment typically range from approximately 75 to 90 dBA at 50 feet (USFHWA 2006). With noise control, individual equipment noise levels would be reduced by approximately 10 dBA. For nearby residential land uses, construction activities would occur in close proximity of the backyards of homes. The residential areas are considered sensitive receptors to the construction activities for the Proposed Project, in particular during the noise-sensitive early morning and evening periods that can result in increased levels of annoyance and potential sleep disruption to occupants. This impact is considered potentially significant. With implementation of Mitigation Measure NZ-1, this impact would be **less than significant**.

MITIGATION MEASURE NZ-1. MINIMIZE CONSTRUCTION-RELATED NOISE.

To reduce noise-related impacts to occupants of nearby residential land uses, the following BMPs will be incorporated into the plans and design of the Proposed Project:

Noise-generating construction activities will be limited to the weekday and weekend restrictions specified by the City's Municipal Code. All construction equipment will be required to have sound-control devices no less effective than those provided on the original equipment. No equipment will have an unmuffled exhaust system.

Additional noise-reduction measures will be implemented as appropriate and practical, including but not limited to: (a) locating staging areas and stationary construction equipment as far away from sensitive receptors as feasible and direct noise emissions away from receptors; (b) limiting equipment idling time; and, (c) notifying nearby residents 48 hours in advance of starting construction in an area not previously affected by recent construction activities.

Require construction contractor to have a designated "noise disturbance coordinator" who will be responsible for responding to noise complaints, determining the causes of the noise, and instituting reasonable measures (as warranted) to correct the problem.

b) The proposed project would not involve the long-term use of any equipment or processes that would result in potentially substantial levels of ground vibration. Temporary construction-related activities for the Proposed Project may result in intermittent ground vibration. Ground-borne vibration levels associated with the conventional and typical construction activities for the proposed pipeline installations and storage tanks would be expected to result in maximum vibration levels no greater than 0.089 in/sec PPV at 25 feet. As a result, predicted ground vibration levels at nearby structures would not be anticipated to exceed the minimum perceptible threshold 0.1 in/sec PPV for human annoyance, nor

would ground vibration levels be anticipated to exceed the minimum threshold of 0.2 in/sec PPV for structural damage. Therefore, this impact would be **less than significant**.

c) Long-term operations-related noise associated with the Proposed Project would be limited to with the additional stationary recycled water pumps installed at the WWTP. However, the additional pumps reflect a minor change to the existing WWTP facilities and would not contribute substantially to noise levels. There would be no change in employees needed for the City to implement the Proposed Project, and noise associated with mobile sources for long-term operations and maintenance of the facilities would be minimal. Therefore, this impact would be **less than significant**.

e, f) The construction areas for the Proposed Project are not located in the vicinity of an airport. Therefore, there would be **no impact**.

3.13 POPULATION AND HOUSING

Would the project…	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☑
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☑
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☑

3.13.1 Setting

The City of Brentwood General Plan identifies the 2021 buildout population for the City as approximately 76,000 and the current population is about 53,000. The City has experienced a high rate of population growth since the 1990's.

3.13.2 Discussion

a-c) The purpose of the Proposed Project is to provide an increased supply of recycled water to existing customers that use potable and non-potable water for irrigation. Consequently, the increased use of recycled water supply would not directly expand any current water use. By reducing the current use of potable and non-potable water, these water sources would be available for other uses or future use. However, the community water supply of potable, non-potable, and recycled water sources is only one factor that facilitates planned growth in the City. Water supply is not a barrier to the City's planned growth; therefore, the water savings derived from the Proposed Project would not result in any inducement of additional

population growth, displace housing, or displace residents. Therefore, there would be **no impact**.

3.14 PUBLIC SERVICES

Would the project…	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant Impact	No Impact
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
i) Fire protection?	☐	☐	☐	☑
ii) Police protection?	☐	☐	☐	☑
iii) Schools?	☐	☐	☐	☑
iv) Parks?	☐	☐	☐	☑
v) Other public facilities?	☐	☐	☐	☑

3.14.1 Setting

The provision of public services in the project area is the responsibility of the City of Brentwood (i.e., police, parks) and other local special districts (e.g., school districts, East Contra Costa Fire Protection District).

3.14.2 Discussion

a) The Proposed Project would involve temporary construction-related activities, and long-term operations of additional recycled water facilities. The Proposed Project would not involve or require any changes in public services. Additionally, the Proposed Project would be operated with existing employees. Therefore, the Proposed Project would not cause any changes to the level of fire and police protection services, schools, or other public services. Therefore, there would be **no impact**.

3.15 RECREATION

Would the project…	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☑

b)	Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☑

3.15.1 Setting

No recreational facilities in the City are located at any of the areas where construction of the Proposed Project facilities would occur.

3.15.2 Discussion

a-b) The project does not involve any construction or change in operations that would result in any change to the existing recreational facilities. The Proposed Project would involve additional use of recycled water for landscape irrigation of recreational fields. However, recycled water irrigation would occur in evening hours when fields are generally not being used, and all irrigation application would be conducted according to Title 22 regulations. Additionally, there would be no expansion of any recreational facilities as a result of the Proposed Project. Therefore, there would be **no impact.**

3.16 TRANSPORTATION/TRAFFIC

	Would the project…	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant Impact	No Impact
a)	Exceed the capacity of the existing circulation system, based on an applicable measure of effectiveness (as designated in a general plan policy, ordinance, etc.), taking into account all relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☐	☑
b)	Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☑
c)	Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☑
d)	Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☑
e)	Result in inadequate emergency access?	☐	☐	☐	☑
f)	Conflict with applicable adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☐	☑

3.16.1 Setting

The Proposed Project would involve construction activities and construction-related traffic and material and waste hauling along major routes including, but not limited to SR4, SR4 Bypass, Sand Creek Rd., Fairview Ave., Brentwood Rd., and Sunset Rd..

3.16.2 Discussion

a) The Proposed Project would result in temporary increases in construction-related traffic on major roadways in the City for construction of the pipeline segments along Sand Creek Rd. and Fairview Ave., and smaller roads that provide access to the RRPS and WWTP recycled water storage tank sites. Final engineering has not been completed for the project, therefore specific locations of the pipeline trenching activities within these road alignments are uncertain. In general, pipeline construction would occur in the roadways and thus involve temporary lane closures. Additional daily construction vehicle trips would not be expected to substantially affect traffic patterns or congestion on the major roadways. The City would require the general contractors for the project to prepare Traffic Control Plans for review and approval by the Engineering Department, and appropriately conduct traffic control and detour operations during construction. Therefore, the potential temporary construction-related effects to traffic and circulation on the City's streets and roadways is considered a **less-than-significant impact**.

b-f) The Proposed Project would not result in any changes to the transportation system infrastructure within the project area. Additionally, the Proposed Project would be operated with existing employees. Therefore, the Proposed Project would not cause any measurable changes in long-term traffic volumes or circulation patterns. Therefore, there would be **no impact**.

3.17 UTILITIES AND SERVICE SYSTEMS

Would the project…	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant Impact	No Impact
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☑
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☑
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☑

d)	Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☑
e)	Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the providers existing commitments?	☐	☐	☐	☑
f)	Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☑
g)	Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☑

3.17.1 Setting

The proponent for the Proposed Project is the City of Brentwood that has responsibility for providing water and wastewater services for the community. The Proposed Project would not involve any construction or changes to stormwater drainage or solid waste management.

3.17.2 Discussion

a) The Proposed Project would not involve any changes to the City's WWTP facilities or operations beyond the proposed additional distribution of recycled water. The City is a permittee with the Central Valley Water Board for a Master Reclamation Permit, which is the current regulatory authorization for the City to operate recycled water facilities according to Title 22 regulations. The City also may pursue authorization under the SWRCB General Waste Discharge Requirements for Recycled Water Use (Order WQ 2014-0090-DWQ) to administer recycled water users associated with the Proposed Project. The Proposed Project would not result in exceedance of any regulatory requirements applicable to the operations of the WWTP. Therefore, there would be **no impact**.

b) The Proposed Project would increase recycled water uses in the project area and this Initial Study fully addresses the potential environmental effects of the project. The Proposed Project does not involve any changes to the City's existing water supply system, other than the long-term operations-related reduction in potable supply uses relative to existing conditions that would occur as a result of increasing recycled water use. Therefore, there would be **no impact**.

c-g) These resource topics are not relevant to the Proposed Project; thus there would be **no impact**.

3.18 MANDATORY FINDINGS OF SIGNIFICANCE

	Would the project…	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant Impact	No Impact
a)	Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☑	☐	☐
b)	Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☑	☐
c)	Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☑

3.18.1 Discussion

a) With respect to terrestrial wildlife resources, as discussed in Section 3.5 ("Biological Resources"), implementation of the Proposed Project has the potential primarily to result in temporary construction-related disturbance to potential habitats in the project area, and several wildlife species, if present during the time of construction. However, feasible project-specific mitigation measures are identified to minimize and avoid the potential adverse effects. The City also would participate in the ECCCHCP program, which is designed to protect core habitat areas and populations of special status species in the region, and promote recovery of species and habitats. The primary long-term operations-related effect of the Proposed Project is the seasonal reduction of WWTP effluent discharge to Marsh Creek, resulting in lower streamflow conditions downstream of the WWTP during months in the summer irrigation season. The reduction in streamflow would not result in any substantial adverse effects to fisheries resources or other aquatic resources, or terrestrial wildlife in the Marsh Creek corridor. A small amount of background streamflow would still exist in the Marsh Creek channel during these periods and there are constructed pools in the lower Marsh Creek streambed that would provide refuge for resident fish. The summer period is not a period of concern for the opportunistic uses of Marsh Creek by any special-status fish species. Consequently, the Proposed Project would not be anticipated to measurably affect special status species populations, range, habitat, migration corridors, or HCP-related species recovery activities. Therefore, with the mitigation measures identified herein, the impact is considered to be **less than significant**.

b) As documented in the impact assessments presented in this IS, the Proposed Project would either not affect, or result in minimal and localized effects with respect to most environmental resources. Furthermore, mitigation measures have been identified to avoid and minimize the effects that may occur (i.e., biological resources, cultural resources, geology and soils, hydrology and water quality, and noise). Additionally, as identified in the Project Description (section 2.4.2, p. 15), the proposed increased use of recycled water would contribute to overall conservation of freshwater resources by the City, which is a goal in the state's Recycled Water Policy. The Proposed Project also would conserve energy used by the City on an annual basis.

Consequently, the assessment of project-related effects indicates that any potential for the Proposed Project to contribute to cumulative impacts would be limited to biological resources, hydrology and water quality. However, the potential for adverse cumulative biological resource conditions in the project area for terrestrial special-status species would be anticipated to improve in the future relative to existing conditions given that the purpose of the ECCCHCP is protection and recovery of species in the region. The City would contribute to the fair share implementation of the ECCHCP for the Proposed Project, and implement appropriate mitigation measures, and thus not contribute considerably to any adverse cumulative terrestrial biological resource impacts.

The Proposed Project incrementally may contribute to cumulative impacts associated with past, present, and reasonably foreseeable effects to aquatic biological resources and water quality issues. As evaluated in Section 3.9 ("Hydrology and Water Quality"), the increased recycled water use would result in the corresponding seasonal reduction in WWTP effluent discharges to Marsh Creek and streamflow downstream of the WWTP. The discharge of some water quality constituents of concern that are present at generally higher concentrations in the effluent than in Marsh Creek, such as nutrients (e.g., nitrogen and phosphorus), chloride, and zinc would thus increase and thus reflect a beneficial contribution to any cumulative effects associated with these constituents.

Constituents of concern in Marsh Creek that are present at higher levels than in the effluent, such as mercury and low dissolved oxygen (DO), may result in degraded water quality conditions downstream of the WWTP. The significance of potential future cumulative water quality conditions for mercury and DO are uncertain, but would likely be affected by increased WWTP effluent discharges over time with City growth, and changes in these conditions upstream of the WWTP. Based on the Feasibility Study Update, the future City growth and effluent production would outpace the potential Phase B2 and B3 customer demands, thus resulting in additional effluent discharge to Marsh Creek. Consequently, any potential mercury and low DO issues may be improved under future cumulative conditions. Regardless, the potential future mercury discharge and loading from the upper Marsh Creek watershed is considered a significant cumulative water quality condition given that Marsh Creek is identified on the state's Section 303(d) list of impaired water bodies for mercury. However, the Proposed Project does not contribute to mercury mass loading, and the incremental change in concentrations in the short reach of lower Marsh Creek associated with the Proposed Project is unlikely to substantially change, if at all, the mercury uptake

and bioaccumulation in the food chain. It is uncertain whether the existing limited seasonal period of low average DO conditions in Marsh Creek represent a significant effect to fisheries and other aquatic resources given that an abundant and diverse warmwater fish community exists with these conditions. Regardless of the effects of the low DO on fish and other aquatic organisms, the identified mitigation measure HWQ-2 would minimize the City's contribution to a less-than-significant level. Consequently, the Proposed Project would not contribute substantially to cumulative mercury and low DO effects, and the contributions would be considered less than considerable and therefore a **less-than-significant impact.**

c) The Proposed Project involves the construction and operation of recycled water facilities, and thus it would support the City's long-term goals of the Conservation and Open Space element of the General Plan to conserve water resources and increase recycled water uses. Final project planning and engineering designs, and project implementation, would be conducted in a manner to minimize the potential temporary construction-related disturbances, and mitigation measures would be implemented for such disturbances. Consequently, the Proposed Project would not cause adverse direct or indirect impacts to people. Therefore, there would be **no impact**.

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APPENDIX A

Air Quality and Greenhouse Gas Emissions Data

AIR QUALITY AND GREENHOUSE GAS

Overall Methodology

Construction and operational emissions were calculated using a combination of model and off-model methods along with the assumptions dictated in the project description. Per BAAQMD recommendations on linear construction projects, emissions from pipeline construction and related paving activities were estimated using the Sacramento Rd. Construction Emissions Model (RCEM) (Version 7.1.5.1) (BAAQMD 2012: B-12). For the non-linear aspects of the project, emissions from water storage tank construction were estimated with the CalEEMod (Version 2013.2.2) computer program, also recommended by BAAQMD (BAAQMD 2013). Both models use emissions factors from the California Air Resources Board's OFFROAD database. However, due to possible differences in model assumptions apart from off-road equipment emissions, all emissions associated with material hauling and worker commute were estimated using the RCEM to maintain consistency in the emission calculations. Construction emissions related to the installation of additional pumping capacity (up to 250 hp) at the WWTP were assumed to be minimal and were not estimated. The methods and assumptions used for calculation of the pipeline and storage tank construction are discussed separately below.

General Assumptions

Construction is anticipated to take between 8 to 12 months. As a conservative estimate, an 8 month or a 170-day construction period was assumed, based on a five day work week and the exclusion of holidays. Because the threshold of significance for both criteria pollutants and GHG emissions are based on average daily emissions, total estimated emissions from the construction of the pipeline and storage tanks were summed then divided by 170 days.

The project description states that pipeline construction, paving activities, and storage tank construction could occur simultaneously and that only a maximum of 7 pieces of large equipment would be operated on any given construction day. All equipment pieces were distributed to each appropriate construction phase per Table 3 (e.g. pipeline, paving, or storage tank construction). In consideration of these constraints, each modeled construction phase, as shown in **Table A-1**, was limited to no more than 7 pieces of equipment per day per construction phase. Although some construction phases may occur at the same time, theoretically resulting in the operation of more than 7 pieces of large equipment per day, the inventory of equipment represented in the models for each construction phase could not be reduced without compromising the both model defaults and project specific requirements. In contrast, the project would result in an average of 2 pieces of large equipment operating per day.

Additionally, assumptions related to on-road hauling activities were provided by Robertson-Bryan, Inc. (pers. comm.) and summarized in the following **Table A-2**. The following table presents the total imported and off-hauled (exported) material quantities as well as the associated trips and assumed miles per trip.

Table A-1. Assumed Number of Daily Equipment Use by Construction Phase.

Construction Phase	Days	Number of Equipment[1]	Number of Large Equipment per phase[2]
Pipeline and Pavement Construction (Modeled with RCEM)			
Grading/Excavation	76	4	3
Drainage/Utilities/Sub-Grade	66	7	3
Paving	28	7	4
Total	170		
Storage Tank Construction (2 tanks) (Modeled with CalEEMod)			
Site Preparation	2	1	1
Grading	4	3	1
Building Construction	214	5	1
Paving	10	7	6
Architectural Coating	10	1	0
Total[3]	240		
Working Days	170		
Weighted average number of equipment per day	2		

Notes:

1 Actual list of equipment by phase can be found in the RCEM and CalEEMod outputs included at the end of this Appendix.

2 Large pieces of equipment exclude smaller pieces such as welders, air compressors, and generators. Equipment list is based on Table 3.

3 Total number of working days for storage tank construction is based off of max of a 120-day construction period estimated for each tank. Since activity may overlap between the two tanks, all activity within storage tank construction is later divided by total working days (170) to estimate average daily construction emissions.

4 Approximate working days for 8 months, excluding holidays and weekends

RCEM = Rd. Construction Emissions Model
CalEEMod = California Emissions Estimator Model™

Source: Modeling conducted by Ascent Environmental in 2014

As described above, all on-road activity was modeled in the RCEM alongside the pipeline installation construction emissions to maintain consistency between the on-road calculation methodologies between RCEM and CalEEMod. The total VMT of haul trucks was used in the RCEM to calculate total project emissions related to on-road hauling activities.

Assumptions by Construction Area and Model

Pipeline Installation, Paving, and On-Rd. Construction Activity (RCEM)

Pipeline installation, related repaving activities, and all on-road construction activity were modeled using the Rd. Construction Emissions Model (Version 7.1.5.1). As mentioned, the construction time was assumed to be 8 months occurring within 2015. The project type was assumed to be new road construction, and the predominant soil type was assumed to be

Table A-2. On-Rd. Truck Hauling Assumptions.

Transported Material	Import (tons)	Import (CY)	Export (CY)	Assumed Capacities per truck	Trips	Mi/ Trip	Total VMT
Pipeline Excavation and Fill	-[1]	5,442	7,320	20 CY	638	15	9570
Pipeline Paving Offhaul and Import	-[1]	2,205	2,205	11 CY	402	15	6030
Pipeline Transport	305	-[2]	-[2]	50,000 lbs	14	30	420
Storage Tank Concrete Hauling	-[1]	1,240	-[2]	7 CY	177	15	2655
Storage Tank Steel Panel	211	-[2]	-[2]	50,000 lbs	9	30	270
Storage Tank Rebar	68	-[2]	-[2]	50,000 lbs	3	30	90
Total	584	8,887	9,525	-	1,243	-	19,035
Calculated Average CY/trip	14.81						
Calculated Average Truck VMT/day[3]	111.97						

Notes:
1 Data was only provided in cubic yards.
2 Data was only provided in tons.
3 Based on an 8 month (170 day) schedule.

"-" = Not applicable or not provided.
CY = cubic yards
Mi = miles
VMT = vehicle miles travelled

Source: RBI pers comm (2014).

"sand gravel". The total project length was based on the total pipeline length of 17,143 feet, or 3.25 miles. The total project area was calculated assuming an average disturbed width of 3 feet for the total pipeline length, a total of 1.18 acres. The project description identified that the maximum length and width of disturbance per day would be 300 feet and 8 feet, respectively. Thus, the maximum area disturbed per day would be 0.06 acres (300 feet by 8 feet). No water trucks were assumed to be used during the construction of the pipeline, which would only be used during the storage tank construction, per the equipment list in Table 3. Soil import and export quantities were not input into the RCEM because the model uses these assumptions to calculate default hauling truck VMT, which were already calculated separately, as shown in Table A-2. The assumed average truck capacity was 15 CY/trip, also shown in Table A-2.

The RCEM default construction periods were overridden to remove the default "Grubbing/Land Clearing" phase as the pipeline construction would occur mostly along existing roadways and would not require clearing or grubbing of undeveloped land. The remaining default construction periods (i.e. "Grading/Excavation", "Drainage/Utilities/Sub-Grade", and "Paving") were assumed to have default ratios between the duration of each phase, but extend through the modeled 8-month time frame. Consistent with the project description, all equipment were assumed to operate for 10 hours per day, as limited by default load factors.

RCEM default soil hauling assumptions were adjusted to equate the model's calculated daily VMT with the daily truck VMT calculated in Table A-2, 111.97 VMT/day. An average of 10

workers per day was assumed for the entire project, as stated in the project description. RCEM default commute lengths and number of trips per day were assumed. Lastly, a variety of other changes were made to the default off-road equipment assumptions which can be seen in the RCEM spreadsheet (Ascent Environmental, Inc. 2015a).

Storage Tank Construction (CalEEMod)

The emissions from the construction of the two proposed water storage tanks were modeled using CalEEMod (Version 2013.2.2). According to the project description, storage tanks require up to 120 days of construction per tank, with possible overlap in the construction of both tanks. Two potential sets of tanks are being considered in the project, a 1MG-3MG and a 2MG-2MG combination of tanks. Given the dimensions of each tank size provided in the project description, the 1MG-3MG tank combination was chosen due to its larger total footprint as a conservative estimate (17,691 sq ft vs. 15,708 sq ft). Both tanks are also assumed to take up a total lot size of 2 acres. The CalEEMod "Unrefrigerated Warehouse-No Rail" land use type was used as a surrogate for the storage tank land use type. The storage tanks were modeled in CalEEMod as one facility with the land use characteristics equal to both tanks.

Construction phase schedules were assumed to be model defaults except for the building construction duration, which was truncated to fit the 240 day limit for the construction of two tanks at 120 days each.

As with the RCEM adjustments, a variety of changes were made to the default off-road equipment assumptions which can be seen in the CalEEMod output spreadsheet (Ascent Environmental, Inc. 2015b). Consistent with the project description, all equipment were assumed to operate for 10 hours per day, as limited by the default equipment load factors. No on-road emissions were calculated with CalEEMod to avoid double counting and consistency between model calculation methods for on-road vehicles. Water trucks were also assumed to be in use during construction, as estimated via the CalEEMod mitigation module for construction off-road equipment.

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APPENDIX B

Cultural Resources Technical Report

BRENTWOOD RECYCLED WATER PIPELINE PROJECT

Cultural Resources Assessment
Brentwood, Contra Costa County, California

Sections 6 and 7, T.1N, R.3E MDM
Sections 11, 12, 14 and 23, T.1N, R.2E MDM
Brentwood, Calif. 7.5' USGS Quadrangle

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January, 2015

MANAGEMENT SUMMARY

The City of Brentwood, Contra Costa County, California, plans to expand its recycled water distribution system. The project consists of approximately 17,000 feet of pipeline construction in existing roadways, two large storage tank locations at the existing wastewater treatment plant and one large storage tank location at the Roddy Ranch pump station vicinity. New pipeline construction would be located on Sand Creek Road and on Fairway Avenue.

Efforts to identify cultural resources, including unique paleontological resources include a search of the University of California, Museum of Paleontology database, a records search by the Northwest Information Center, California Historical Resources Information System, a sacred lands file search by the Native American Heritage Commission, attempted contacts with Native Americans listed by the commission for this project, literature review and an archaeological field inspection.

The paleontological database search resulted in the identification of a vertebrate fossil locality in the project vicinity and a geologic formation that could yield vertebrate fossils on a portion of the proposed pipeline route. The records search by the Northwest Information Center identified the Southern Pacific Railroad (aka Central Pacific Railroad/San Pablo-Tulare Railroad) and two bridges also along the proposed pipeline route. However, the Native American Heritage Commission's sacred lands file search failed to identify any Native American cultural resources in the project vicinity. The field inspection by the archaeological field team also did not identify any cultural resources other than the two bridges and the railroad documented by the information center's records search.

The two bridges were previously evaluated by the California Department of Transportation (Caltrans) as not eligible for the National Register of Historic Places. The information center's records search did not provide any evidence that either the bridges or the railroad have been evaluated for California Register of Historical Resources eligibility, or for local listing. However, it is anticipated that the proposed recycled water pipeline project will use existing conduits already in place at the two bridge locations, as well as under the railroad. Therefore, the proposed project will have no adverse effect on the three identified structures.

Ground disturbing activities have the potential to impact unique paleontological resources particularly during excavation to install new pipeline along Fairview Avenue within the geologic Qtu gravel unit. Also, ground-disturbing activities have the potential to disturb or destroy buried prehistoric and historic archaeological resources including human remains.

The following recommendations are offered to reduce potential impacts to a less than significant level:

1. A qualified professional paleontologist shall periodically monitor excavation for the proposed pipeline along Fairview Avenue to check for fossils that may be unearthed in the geologic Qtu gravel unit.

2. If vertebrate fossils (e.g., teeth, bones) are unearthed by the construction crew anywhere on the project, the finds should be set aside and all excavation activity cease at the specific place of discovery until the paleontologist has assessed the find and, if deemed significant, salvaged the find

in a timely manner. Work may proceed on other parts of the project while assessment and/or salvage by the paleontologist is underway. Finds determined significant by the paleontologist would then be conserved and deposited with a recognized repository such as the University of California Museum of Paleontology.

3. In the event of the accidental discovery or recognition of any human remains, there shall be no further excavation or disturbance of the find or any nearby area reasonably suspected to overlie adjacent human remains, until compliance with the provisions of §15064.5(e)(1) and (2) of the CEQA Guidelines has occurred.

4. If any prehistoric or historic artifacts, or other indications of cultural resources such as unusual deposits of stone, bone or shell, stone artifacts, or historic trash deposits or foundations are discovered once ground-disturbing activities are underway, the find shall be immediately evaluated by a qualified archaeologist. If the find is determined to be a historical or unique archaeological resource, contingency funding and a time allotment to allow for implementation of avoidance measures or appropriate mitigation shall be made available, as provided in §15064.5 of the CEQA Guidelines. Work may continue on other parts of the project site while historical or unique archaeological resource mitigation takes place on-site.

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LIST OF FIGURES

INTRODUCTION

The City of Brentwood, Contra Costa County, California, plans to expand its recycled water distribution system. The project consists of approximately 17,000 feet of pipeline construction in existing roadways, two large storage tank locations at the existing wastewater treatment plant and one large storage tank location at the Roddy Ranch pump station vicinity. New pipeline construction would be located on Sand Creek Road and on Fairway Avenue (see Figures 1 and 2, below).

CEQA Regulatory Background

The California Environmental Quality Act (CEQA) statutes [Public Resources Code §21001(b) *et seq.*] require planning agencies to carefully consider the potential effect of a project on historical resources. Under CEQA guidelines in §15064.5, a historical resource includes: a resource listed in or eligible for the California Register of Historical Resources; or listed in a local register of historical resources; or identified in a historical resource survey and meeting requirements in §5024.1(g) of the Public Resources Code; or any object, building, structure, site, area, place, record, or manuscript that a lead agency determines historically significant, provided the determination is supported by substantial evidence in light of the whole record; or a resource so determined by a lead agency under Public Resources Code §5020.1(j) or §5024.1.

Under CEQA Guidelines, "A project with an effect that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment" [Public Resources Code §15064.5(b)]. "Substantial adverse change" is ". . . physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired [Public Resources Code §15064.5(b)(2)].

While alteration of the setting of an archaeological site that is eligible only for its information potential may not affect the site's significant characteristics, alteration of a site's location (*viz.*, removing or damaging all or part of the site) may have a significant adverse effect. CEQA's Guidelines §15126.4(b)(3) state, "Public agencies should, whenever feasible, seek to avoid damaging effects on any historical resource of an archaeological nature." The guidelines further state that preservation in place is the preferred manner of mitigating impacts, and that preservation ". . may be accomplished by, but is not limited to, the following":

1. Planning construction to avoid archaeological sites;

2. Incorporation of sites within parks, greenspace, or other open space;

3. Covering the archaeological sites with a layer of chemically stable soil before building tennis courts, parking lots, or similar facilities on the site.

4. Deeding the site into a permanent conservation easement.

CEQA Guidelines state, "when data recovery through excavation is the only feasible mitigation, a data recovery plan, which makes provision for adequately recovering the scientifically consequential information from and about the historical resource, shall be prepared and adopted prior to any excavation being undertaken" [CEQA Guidelines §15126.4(b)(3)(C)]. However, "data recovery shall not be required

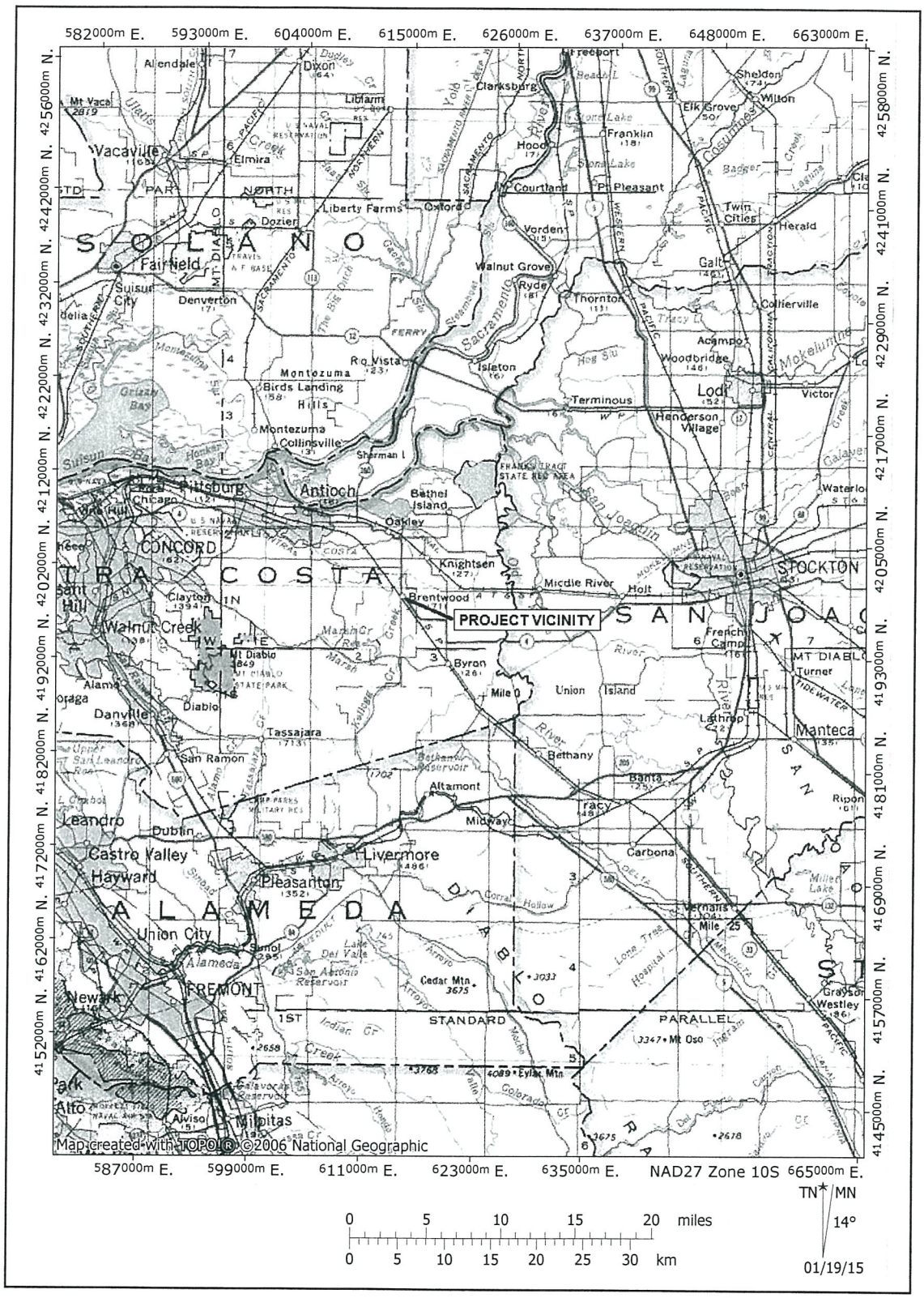

Figure 1. Project vicinity.

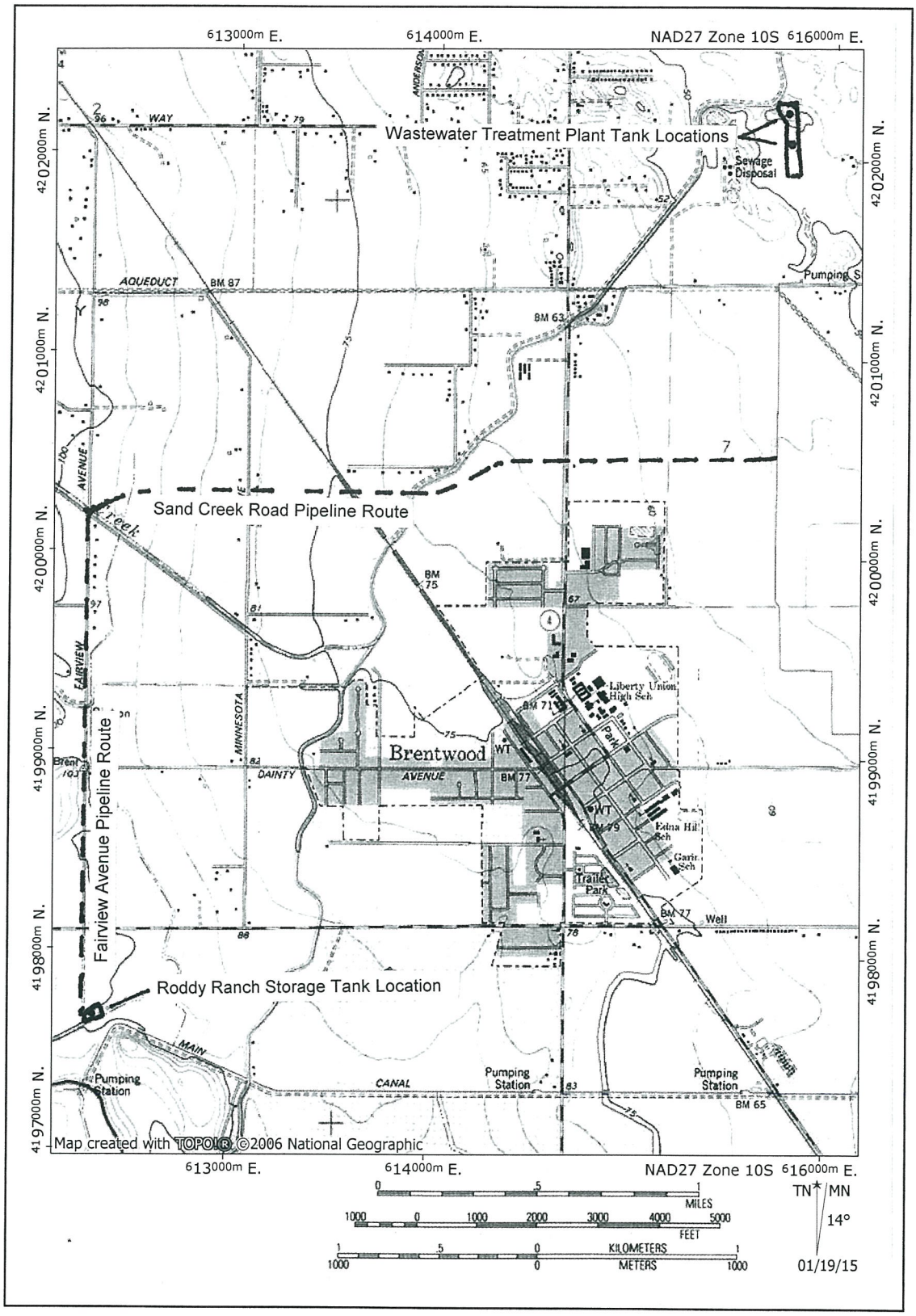

Figure 2. Project location.

for a historical resource if the lead agency determines that testing or studies already completed have adequately recovered the scientifically consequential information from and about the archaeological or historical resource . . ." [CEQA Guidelines §15126.4(b)(3)(D)].

CEQA also requires agencies to consider the effects of a project on "unique archaeological resources." If an archaeological site meets the definition of a unique archaeological resource (Public Resources Code §21083.2), then the site must be treated in accordance with the special provisions for such resources, which include time and cost limitations for implementing mitigation.

California law protects Native American burials, skeletal remains and associated grave goods regardless of their antiquity, and provides for the sensitive treatment and disposition of those remains (Health and Safety Code §7050.5, Public Resources Code §5097.94 *et seq.*).

Like archaeological resources, paleontological resources are non-renewable and once destroyed, they are lost forever. Appendix G (Part V), CEQA Guidelines states that a project may have a significant impact on the environment if it will destroy a unique paleontological resource or site of unique geological feature(s). The guidelines require the assessment and mitigation of impacts to paleontological resources on all discretionary projects. Public Resources Code §5097.5 regulates the unauthorized removal of paleontological remains. Penal Code §622.5 sets penalties for damage to or removal of archaeological (paleontological) resources.

SETTING

The physical setting is largely within the modern built environment of Brentwood, which was formerly a part of Dr. John Marsh's *Rancho Los Meganos*. At the south end of the project area, the proposed location of the Roddy Ranch storage tank lies next to the north bank of Dry Creek in a small undeveloped corner of an existing new residential neighborhood. A canal and pumping station are situated on the south side of Dry Creek. The proposed recycled water line would run north along Fairview Avenue crossing Deer Creek, Sand Creek, then east along Sand Creek Road crossing Marsh Creek and ending in a residential development currently under construction. The proposed two locations for a new tank at the existing wastewater treatment plant lie adjacent to agricultural land and the built portion of the wastewater treatment plant (see Figures 3 and 4 and Appendix A: Photographs).

Geology/Paleontology

The Brentwood area is located on flat terrain consisting mostly of young sedimentary deposits, ranging from Pliocene to Holocene in age (Graymer *et al* 1944; Helley and Graymer (1997; Dibblee 2006). Animal or plant remains in Holocene deposits are too young to be considered fossils. Two units mapped in the area, dune sands (Qds) and gravel (Qtu), however, have the potential to yield significant paleontological resources. The undifferentiated Holocene/ Pleistocene dune sands unit is mapped in the northeast and includes the wastewater treatment plant location. The undifferentiated Pleistocene/Pliocene gravel unit occurs in the southwestern portion of the map and includes a portion of the pipeline route along Fairview Avenue (see paleontologist's database search results, Appendix B).

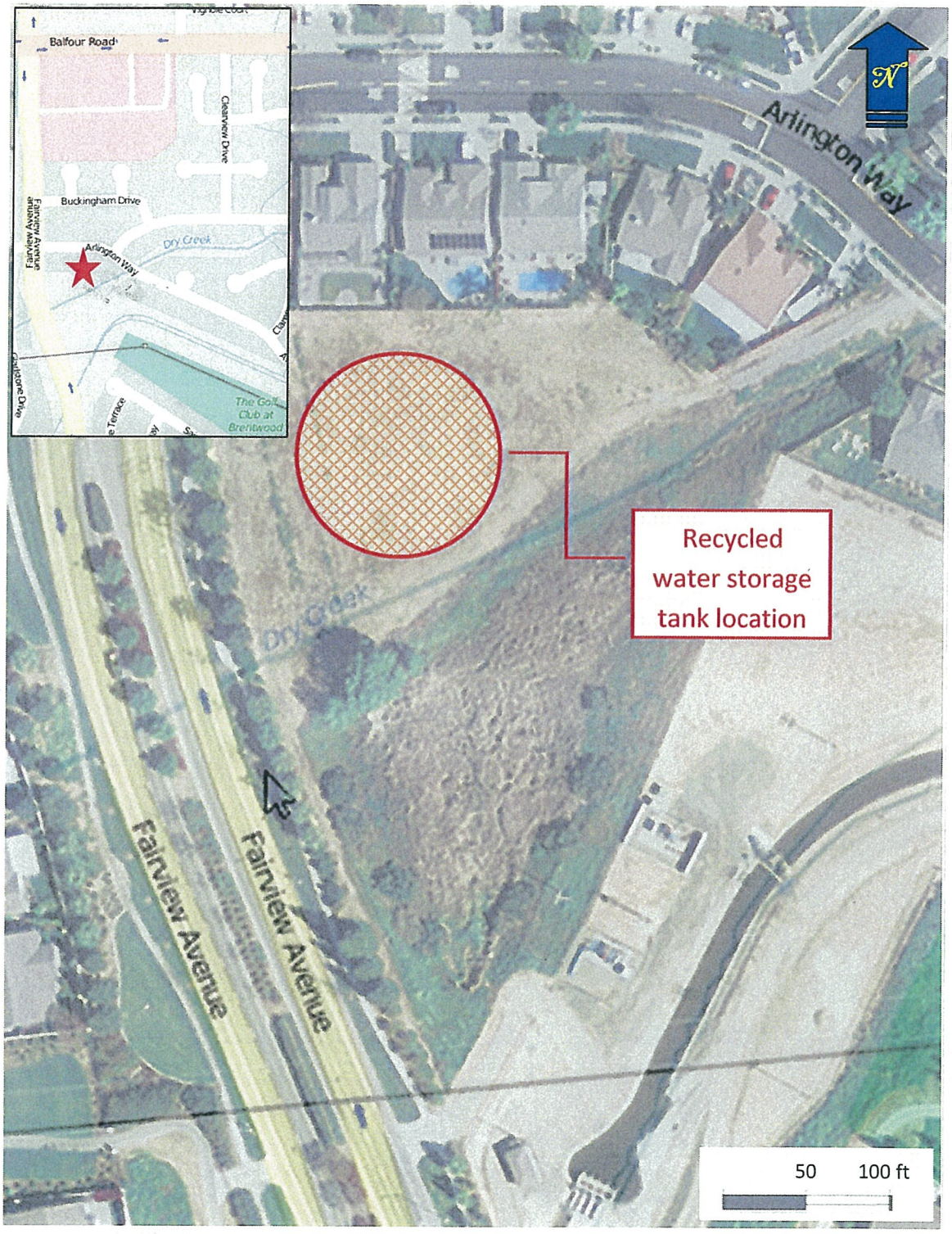

Figure 3. Site plan for recycled water storage tank at the Roddy Ranch Pump Station location.

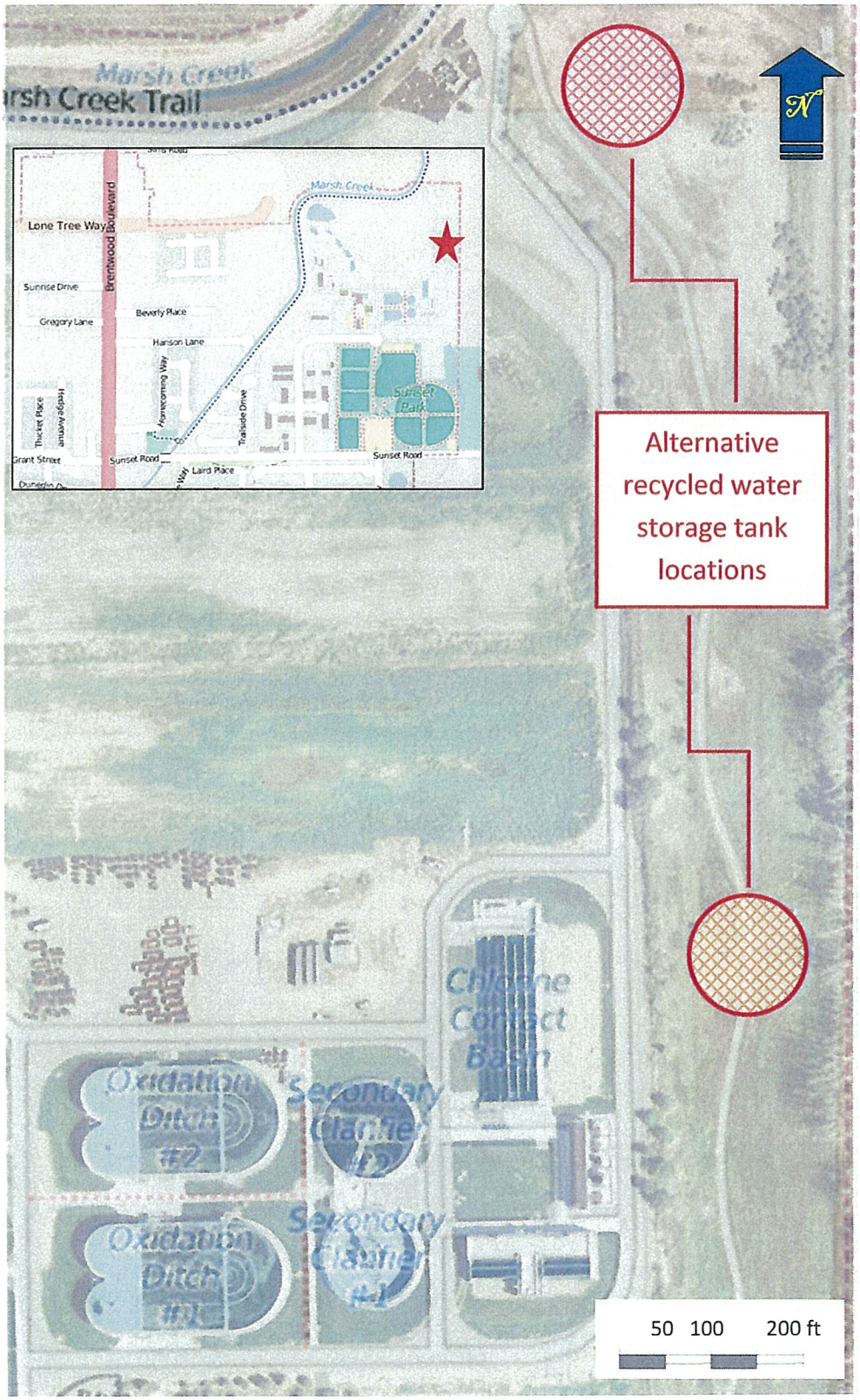

Figure 4. Site plan for alternative recycled water storage tanks locations at the wastewater treatment plant.

Prehistory

The greater San Francisco Bay area was inhabited by diverse peoples for more than 10,000 years. When the bay and delta formed, the region emerged ". . . as a distinctive cultural center with influences extending to and from the Central Valley and Coast Ranges" (Moratto 1984:218).

Until 1970, most of the archaeological sites investigated were middens, deposits of refuse at village and camp sites, dating back 3000-4000 years. Radiocarbon-dated finds between San Francisco and Monterey bays indicated that human beings were in the region as early as 8000 B.C. In addition, a dozen or more archaeological sites in the Bay Area have been dated to the period, 5000-2000 B.C. A Contra Costa County site (CA-CCO-308) situated near Walnut Creek was dated to this latter period. The location of these early settlements, whether in hill country, bay or ocean shores, are marked by earth or sand deposits with relatively sparse shell. Artifacts from this early period include large projectile points and milling stones.

A new and distinctive culture of bayshore and marsh-adapted people appeared after 2000 B.C. By the beginning of the Christian era, numerous villages were established throughout the San Francisco Bay region. The late archaeologist David Fredrickson identified these settlements collectively as the "Berkeley Pattern," a variant of his "Windmiller Pattern" of the interior valley and distinct from the late "Borax Lake Pattern" of the north coast ranges (Fredrickson 1973:116-133).

In his 1984 synthesis of California archaeology, Moratto contended that the Early Bay Culture was a relict Hokan population in contact with early Costanoans (Moratto 1984:279). The Berkeley Pattern, represented Utian (Miwok-Costanoan) speaking people who were settling older Hokan territories in the Bay Area and along California's central coast. It appeared to Moratto that people belonging to Utian language groups first occupied eastern Contra Costa County around 2500-2000 B.C., coincidental with the rise in sea level and birth of the delta region. The Utians expanded westward to San Francisco Bay by *circa* 1900 B.C. By 1500 B.C., ancestral Costanoans had settled at the southern end of San Francisco Bay and by 500 B.C., their territory had expanded to include the Santa Clara Valley (Moratto 1984:279).

Concurrently, ancestral Miwok-speaking groups moved into the North Bay area. Yukian and possibly Hokan language groups on the Marin coast were displaced by ancestral Miwokans between 1000 and 500 B.C. However, the way in which older populations were displaced by new ones is still poorly understood.

The subsequent Augustine Pattern, which began *circa* A.D. 300-500, did not appear to mark a replacement of Utian populations in the bay region, according to Moratto. However, artifacts characteristic of the Augustine Pattern denoted, in the northeast Bay Area, the southward expansion of Wintuan (ancestral Patwin) peoples into Bay Miwok territory (Moratto 1984:283).

In 1987, James Bennyhoff provided an updated overview of Middle and Late period West Delta and Bay Area prehistory (Bennyhoff 1994:81-89). Bennyhoff contended that the earliest phase of the Berkeley Pattern was not simply a variant of the Windmiller Pattern suggested by Moratto (*cf.* Bennyhoff 1994:83 and Moratto 1984:207ff). Based on an analysis of human remains, it appeared to Bennyhoff that two separate populations were represented. The Windmiller Pattern included early period sites in the Sacramento, Cosumnes, Stockton districts and well into the West Delta. Lower Berkeley Pattern sites were located around San Francisco, San Pablo and Suisun bays (Bennyhoff 1994:Figure 8.1).

Bennyhoff further contended that the Meganos Culture, which he identified in 1968, was the result of a "hybrid" Windmiller population intermarrying with people of the Berkeley Pattern. "Meganos" meant

"sand mound," referring to the non-midden cemeteries found in the sand mounds on West Delta islands. Bennyhoff asserted that the Meganos Culture rose between 500 and 200 B.C., that it was always centered in the San Joaquin Valley, but expanded into parts of the Bay Area by the late Middle period circa A.D. 300-700.

The Middle-Late transition, A.D. 700-900, was a period of disruption across Central California, suggested Bennyhoff. With the southward expansion of Wintuan peoples, probably the bearers of the Augustine Pattern, the Meganosans appear to have retreated to the Sacramento Delta. The intruding Patwin, a Wintuan-speaking people, moved deep into the Solano District and apparently forced the resident ancestral Bay Miwok across the West Delta to the south side of Suisun Bay. Ancestral Karkin Costanoans, who lived on the north side of San Pablo and Suisun bays, also moved to the south across Carquinez Strait to join other Costanoans from whom they had been physically separated for 300 years. It was during this time, A.D. 700-900, that the Meganos cemeteries in the Alameda and Diablo districts were abandoned.

During the earliest phase of the Late period, A.D. 900-1100, Bennyhoff indicated that the Bay Miwok expanded eastward into the West Delta, occupying the Hotchkiss Mound (CA-CCO-138) located near the present-day community of Bethel Island. Concomitantly, the nearby Meganos cemeteries at CA-CCO-20 and CA-CCO-139 were abandoned. The study of a late period Meganos cemetery in Stockton (CA-SJO-154) showed that the Meganos survivors integrated with Valley Yokuts people. By the period A.D. 1100-1300, a new settlement pattern was evident for the Stockton District (Bennyhoff 1994:83).

A recent updated synthesis has taken the generally recognized cultural periods and updated the time span of each period based on new radiocarbon determinations adjusted with modern calibration curves (Rosenthal *et al.* 2007:150):

Paleo-Indian (11,550-8550 cal B.C.)
Lower Archaic (8550-5550 cal B.C.)
Middle Archaic (5550-550 cal B.C.)
Upper Archaic (550 cal B.C.-cal A.D. 1100)
Emergent (cal A.D. 1100-Historic)

Like Europe, the prehistory of California is a complex story of movement, displacement as well as integration of entire populations. While the broad patterns of this prehistory are understood, archaeologists are still discovering who was living where and during which time periods. We have much to learn about these extinct societies, their relations with each other and with the environment.

Ethnography/Ethnohistory

History records that Dr. John Marsh, who acquired *Rancho Los Meganos* in 1842, made mention of the *Pulpines* (*Pulpunes*) on the southeastern flanks of Mount Diablo and on islands in the delta (Collier 1983:15). The Brentwood Recycled Water project would have been located in a border area between Bay Miwok and Northern Valley Yokuts-speaking peoples. The Bay Miwok ranged from Mount Diablo northeastward to Antioch and the West Delta. The Northern Valley Yokuts lived, hunted, fished and gathered in the central valley.

However, Bennyhoff in his definitive work on the *Ethnogeography of the Plains Miwok* stated that the territory of the West Delta *Julpun* tribelet of Miwok-speaking people probably extended to lower Marsh Creek. John Marsh found a few returned 'Pulpunes' neophytes in 1838. This would place the Brentwood

Recycled Water project within pre-mission period *Julpun* (Bay Miwok) territory.

> Excavations in CCO-138 (the Hotchkiss Mound), about six miles north of the Brentwood Recycled Water project and the largest site yet known in the Diablo district, revealed a long history of occupation that was terminated at or just prior to the historic period. This site may well have been the aboriginal *Julpun* tribelet center (Bennyhoff 1977:144).

Bennyhoff continued his speculative reconstruction of *Julpun* history by suggesting that the *Julpun* may have moved its tribelet center to an unidentified island on the north bank of the San Joaquin River shortly after intensive mission contact began in 1810 (Bennyhoff 1977:144).

Miwok-speaking people organized themselves into tribelets. Several more or less permanent settlements and a larger number of seasonal campsites combined to make an independent, land-holding group within a well-defined territory (Levy 1978:398).

Each tribelet included a number of lineages. The lineage was an extended kinship group in which descent was reckoned from a known ancestor who lived usually not more than five or six generations back. Lineages were tied to specific settlements and were named for that locality.

Miwok people living along the waterways of the West Delta were fishermen, hunters and gatherers. Some villages may have specialized in fishing, while others relied on seasonal rounds of hunting, fishing and seed gathering.

Miwok-speaking people lived in dome-shaped houses covered with tule mats or tule thatch. Semi-subterranean lodges were also constructed. In the central valley, large semi-subterranean structures were used as assembly houses and were found mainly in the principal village (or center) of each tribelet. Other structures in a village included a sweathouse built over a pit 2-3 feet deep, a menstrual hut, acorn granaries and shelters over mortars where acorns were pulverized for meal.

By 1797, the Mission Delores was founded. Settlement at the mission led to a renewed interest in the East Bay region. Explorers and missionaries penetrated the San Joaquin-Sacramento Delta in search of neophytes. Much of the territory of Bay Miwok tribelets was cleared of its entire native population by 1824, if not earlier. Many were sent to Mission San Jose (Levy 1978:400). By 1832, as a consequence of missionization, the population of the Bay Miwok in general had declined by 80 percent.

The 1824 Kotzebue map and several diaries written during the period between 1796 and 1817 indicate that the *Julpun* ". . . controlled the islands and adjacent west bank of the San Joaquin River where the three branches reunite" (Bennyhoff 1977:144).

Bennyhoff indicated that baptismal dates for *Julpun* end in 1827; he suggested that *Julpun* territory southeast of the mouth of the San Joaquin River was abandoned by that time. Yet, it was apparent to Bennyhoff that the few *Julpunes* who survived secularization of the missions and left the Indian settlements around the missions, returned to their native territory. As a consequence, Marsh was able to find and use local Native American labor when he settled on *Rancho los Meganos*, which he named, "Farm of the Pulpunes" (a variation of *Julpun*) (Bennyhoff 1977:62).

History

The *Rancho Los Meganos* ("sand hills") land grant was made to Jose Noriega, who came to California

on the ship "Natalie" in 1834. It was during the following year, 1835, that Noriega became treasurer at the pueblo of San Jose and was ceded the land, *Rancho Los Meganos*. In the following years between 1834 and 1841, Noriega also became co-owner of *Rancho Las Positas* with Robert Livermore and shared another land grant, *Rancho Quito* with Jose Zenon Fernandez (Collier 1983:89).

Noriega and his wife occupied *Rancho Los Meganos* until the spring of 1842, when he officially sold the place to Dr. John Marsh. An early survey resulted in a figure of 52,083 acres describing the land grant. With the assistance of local native labor, Marsh built an adobe house with four rooms, an attic and a thatched roof. He later constructed a stone house (Collier 1983:89-90).

Brentwood was named after the Brentwood in Essex, England, home of John Marsh's family. In the 1860s and early 1870s, two schools, a few businesses and a saloon were established. In 1867, the Brentwood Coal Mine was opened.

Coal (lignite) was discovered at a site about halfway between Mount Diablo and Antioch in 1858. Most notable among the mines later developed were the Black Diamond Coal Mine, the Cumberland Mine, Pittsburg Mine, Central Coal Mine, Union Mine, Independence Mine and the Brentwood Coal Mine, which was located on the old Marsh *rancho* (Munro-Fraser 1882:131-132).

Construction of the San Pablo and Tulare Railroad prompted the owners of the old Marsh land grant to donate a tract of land to lay out the town. Fish & Blum of Martinez constructed a warehouse to accompany the new train depot (Munro-Fraser 1882:496-497).

Although coal was responsible for a brief fluorescence of the region, agriculture became its mainstay. John Marsh is reported to have made the first attempt at cultivating cereal crops in Contra Costa County. In 1846, Marsh wrote:

> The agricultural capabilities of California are but very imperfectly developed. The whole of it is remarkably adapted to the culture of the vine. Olives, figs and almonds grow well. Apples, pears and peaches are abundant and in the southern part, oranges. Cotton is beginning to be cultivated and succeeds well. Maize produces tolerably well, but not equal to some parts of the United States. Hemp, flax and tobacco have been cultivated on a small scale, and succeed well. The raising of cattle is the principal pursuit of the inhabitants and the most profitable (Munro-Fraser 1882:55-56).

Like other agricultural areas throughout the delta and San Joaquin Valley regions, the Brentwood area was on the forefront of California's wheat boom of the 1880s and 1890s. By1890, Brentwood was the largest shipping point for grains between New Orleans and San Francisco. It was during this same period that coal declined and California oil became the fuel of industry.

The beginning of the twentieth century brought many changes in both ownership and agricultural production in the area. In 1910, Balfour, Guthrie and Company purchased the Marsh Ranch. Three years later, the company subdivided 12,616 acres bringing more small farmers and ranchers to the area. During the 1920s, local farmers planted the first orchards.

By an overwhelming vote, the residents of Brentwood established the first Contra Costa water district to serve the town with a domestic water supply. This was the first district in Contra Costa County under the County Water District Act. In addition, the East Contra Costa Irrigation District was established. The new district consolidated Lone Tree, Knightsen, and Brentwood Irrigation companies.

The change to orchards in the early 1920s attracted more large-scale farming operations. H.P. Garin, for example, leased 600 acres in Brentwood in 1926. By 1935, Garin controlled over 30,000 acres throughout California.

The City of Brentwood was incorporated in 1948. While the city remained a predominantly rural agricultural community, the post war population boom in the Bay Area changed the economic focus of the entire region. People could live in Brentwood and commute to factory jobs in Pittsburgh and Martinez. The trend away from a rural agricultural community towards a suburban city began slowly. The 1978 USGS Brentwood quadrangle shows that none of the proposed recycled water pipeline route was yet developed beyond agriculture and scattered rural residences.

PALEONTOLOGICAL DATABASE SEARCH RESULTS

On September 22, 2014, Kenneth L. Finger, Ph.D., conducted a search of the University of California, Museum of Paleontology's database. The database records search revealed 63 Pleistocene and 12 Pliocene vertebrate fossil localities from Contra Costa County represented by 9,924 and 1,267 specimens, respectively. One of the localities (V92081) yielded remains of the American mastodon, *Mammut americanus* located within the proposed project area.

RECORDS SEARCH RESULTS

On October 6, 2014, the Northwest Information Center, California Historical Resources Information System completed a cultural resources records search of the proposed tank locations at the wastewater treatment plant and the location for the Roddy Ranch tank plus a quarter mile radius around each location, as well as the pipeline route along Fairview Avenue and Sand Creek Road plus a one-eighth mile radius (NWIC File No. 14-0315).

As a result of the records search, information center staff identified one cultural resource located within the project area. The resource is designated "P-07-000813," the old San Pablo-Tulare Railroad route illustrated on the 1978 USGS Brentwood quadrangle as "Southern Pacific." The referenced technical reports for the segment of railroad that crosses only the one portion of proposed recycled water project is S-035244, a series of archaeological, architectural/historical evaluation, field study and management reports conducted by Archaeological/Historical Consultants in 2007-2008 (Baker and Shoup 2007a; Baker and Shoup 2007b; Shoup 2007; Hill *et al.* 2007; Baker and Shoup 2008).

Information center staff found no listing in the Archaeological Determinations of Eligibility, California Inventory of Historic Resources or local inventories. There were no apparent relevant listings in Brentwood on the Office of Historic Preservation's Directory of Properties in the Historic Property Data File for Contra Costa County provided with the records search and dated April 5, 2012. Two bridges are listed in the August 2013 Caltrans Structure Maintenance and Investigations Historical Significance-Local Agency Bridges in the project area. The O'Hara Avenue at Marsh Creek bridge (Bridge No. 28C0258) is located on the proposed pipeline route along Sand Creek Road. Caltrans identifies the bridge as built in 2002 and evaluated as "not eligible for the National Register of Historic Places.

The second bridge, Sand Creek Road at Sand Creek (Bridge No. 28C0399) is located at the cross-roads where the pipeline turns east from Fairview Avenue to Sand Creek Road. Caltrans identifies the bridge as built in 1966 but widened/extended in 2002. The 2013 Caltrans bridge inventory indicates that the bridge is not eligible for the National Register. No further bridges are listed by Caltrans for the proposed

pipeline route.

The records search included copied segments of historic maps. The General Land Office plat dated September 1862 showed roads roughly paralleling Marsh Creek northwest and southeast of the proposed wastewater treatment plant storage tank locations. The much smaller scale and undated Map of Contra Costa County illustrated the boundaries of Los Meganos and the San Pablo and Tulare Railroad in the project area. The 1862 Plat of the Rancho Los Meganos Finally Confirmed to Alice Marsh illustrates a half dozen roads and few other man-made features.

The 1914 USGS Byron 7.5' quadrangle illustrates the diminutive town of Brentwood situated largely on the east side of the Southern Pacific Railroad tracks. The town is also centered on a cross-roads of north-south and east-west vehicle roads. In the immediate surroundings, 1-6 houses per square mile are illustrated. The 1916 USGS Byron 15' quadrangle illustrates much the same distribution of man-made features. The 1940 USGS Byron 15' quadrangle illustrates a small Brentwood on the railroad (Southern Pacific) and houses scattered along north-south and east-west roads around the town.

The 1954 USGS Brentwood 7.5' quadrangle illustrates a larger Brentwood surrounded mainly by orchards. A small sewage disposal plant surrounded by orchards is illustrated at the location of the modern wastewater treatment plant. The Sand Creek Road pipeline route is divided between orchard and open land. A house and barn are illustrated on the east side of Brentwood Boulevard south of the San Creek Road pipeline route. The San Creek Road pipeline route crosses the Southern Pacific Railroad with open land to the east and orchards to the west. The route crosses Minnesota Avenue with several houses illustrated on both sides of Minnesota in the near vicinity. The pipeline route south along Fairview Avenue shows orchards on both sides of the road to the south side of Dainty Avenue where a triangular area of open ground with five buildings lie on the east side of Fairview. A vineyard is illustrated on the same east side of the road south to Balfour Road. South of Balfour, an orchard is illustrated. On the north side of Dry Creek in the area proposed for the Roddy Ranch storage tank, the map illustrates bare ground (see Appendix B: Records Search Results for a copy of the records search report).

NATIVE AMERICAN COORDINATION

On September 3, 2014, the Native American Heritage Commission completed a search of its sacred lands file for the Brentwood Recycled Water Pipeline project. In the commission's letter report, staff indicated that the file search failed to indicate the presence of Native American cultural resources in the immediate project vicinity. Staff enclosed a short list of Native American individuals and organization that may have knowledge of Native American cultural resources in the area.

- Ms. Katherine Erolinda Perez;
- Mr. Andrew Galvan, The Ohlone Indian Tribe;
- Ms. Ramona Garibay, Representative, Trina Marine Ruano Family

The above individuals were contacted by US mail in a letter dated September 15, 2014. The letter indicated that the Native American Heritage Commission recommended contacting each individual for information he or she may have regarding specific knowledge of cultural resources. The letter included a brief description of the proposed project and included a location map. There was no response from the letter (see Appendix C: Native American Coordination).

FIELD METHODS

On November 5, 2014, a field inspection was conducted of the pipeline route, the location of the proposed Roddy Ranch storage tank and two storage tank locations at the wastewater treatment plant. Ric Windmiller, M.A., Registered Professional Archaeologist led the pedestrian field survey. Windmiller has more than 40 years experience directing archaeological field surveys and excavations. Windmiller was assisted by Steve Laumann with eight seasons experience in archaeological field surveys.

Archaeological survey of the proposed pipeline route was conducted of exposed ground, which was limited to existing open space within 15 meters of each side of Sand Creek Road from the east end of Sand Creek Road to its intersection with Fairview Avenue. In and around the east end of Sand Creek Road, new residential construction was underway and the ground surface was exposed for inspection, as well. However, along Fairview, vacant land was primarily north of the southeast corner of Fairview and Central. Here, visual inspection was conducted within 15 meters of the road's edge. In each case ground visibility was good with very little vegetation.

At the Roddy Ranch Pump Station location, a triangular-shaped area of vacant land between Fairview on the west, a new residential neighborhood on the north and Dry Creek on the south was inspected on foot along zig-zagging transects about five meters apart. This is the location for the Roddy Ranch recycled water storage tank. The gravelly ground surface was largely bare of vegetation. Visibility was good.

At the wastewater treatment plant, two alternative storage tank locations lie within a narrow strip of land bordered on the east by a fence and on the west by the treatment plant. The area was weedy; visibility of the ground surface varied between 20 and 80 percent. The area around the proposed tank locations and the area between the two locations appears to have been graded at some time in the past. The area was inspected along zig-zagging transects approximately five meters apart.

DESCRIPTION OF CULTURAL RESOURCES

No "new" cultural resources were identified along the pipeline route, the Roddy Ranch Pump Station location for a proposed water storage tank or the two alternative locations for a water storage tank at the wastewater treatment plant. However, three structures were previously identified along the proposed pipeline route: the O'Hara Avenue (and Sand Creek Road) at Marsh Creek bridge (Bridge No. 28C0258); Southern Pacific (aka Central Pacific or San Pablo-Tulare) Railroad (P-07-000813) and; the Sand Creek Road at Sand Creek bridge (Bridge No. 28C0399). While no paleontological resources were identified during the archaeological field survey, there is a reported nearby fossil locality.

Paleontological Resources

No paleontological resources were identified during the field inspection, nor were any previous finds reported in the database search specifically at the proposed storage tank locations or along the proposed pipeline. However, the database search did conclude that one of reported fossil localities (V92081) is within the project vicinity. That locality yielded remains of the American mastodon, *Mammut americanus* (also see "Paleontological Database Search Results," above).

Prehistoric/Historic Archaeological Resources

No prehistoric or historic archaeological resources were identified along the pipeline route or at the three proposed water storage tank locations.

Buildings/Structures

Bridge No. 28C0258 (O'Hara Avenue and Sand Creek Road at Marsh Creek Bridge)

According to the listing of historical significance-Local Agency Bridges, the California Department of Transportation's (Caltrans) August 2013 Structure Maintenance & Investigations, the O'Hara Avenue at Marsh Creek Bridge was constructed in 2002.

Bridge No. 28C0399 (Sand Creek Road at Sand Creek Bridge)

The Caltrans listing of Historical Significance-Local Agency Bridges of August 2013 indicates that the bridge was constructed in 1966, but widened/extended in 2002.

P-07-000813 (Southern Pacific aka Central Pacific or San Pablo-Tulare Railroad

The old San Pablo-Tulare Railroad was identified by the Northwest Information Center as crossing the proposed pipeline route on Sand Creek Road. The railroad in the Sand Creek Road vicinity lies on a high earthen berm with wooden ties and standard gauge tracks.

EVALUATION

Under the California Environmental Quality Act (CEQA), historical resources are recognized as a part of the environment [Public Resource Code §21001(b), §21083.2, §21084(e), §21084.1]. A historical resource includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript that is historically or archaeologically significant, or important in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military or cultural annals of California (Public Resources Code §5021.1).

The California Register is an authoritative listing and guide for state and local agencies and private groups and citizens in identifying historical resources. The California Register includes historical resources that are listed automatically by virtue of their appearance on or eligibility for certain other lists of important resources. The Register includes historical resources nominated by application and listed after public hearing. Also included are historical resources listed as a result of an evaluation by specific criteria and procedures adopted by the State Historical Resource Commission.

The criteria used for determining what is a historical resource are similar to those developed by the National Park Service for listing on the National Register of Historic Places. However, criteria of eligibility for the California Register were reworded to better reflect California history.

Any building, site, structure, object or historic district that meets one or more of the following criteria and retains sufficient integrity to convey its importance in history or prehistory may be a historical

resource.

1. It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States;

2. It is associated with the lives of persons important to local, California, or national history;

3. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or

4. It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

In addition to meeting one or more of the above criteria, eligibility for the California Register also depends on the integrity, or the survival of characteristics of the resource that existed during its period of significance. Historical resources must not only meet at least one of the above criteria, but also they must retain enough of their historic character or appearance to convey the reasons for their importance, or retain the potential to yield significant scientific or historical information or specific data.

Like the process of evaluating historical resources for National Register eligibility, California Register evaluations include the consideration of seven aspects of integrity: location, design, setting, materials, workmanship, feeling and association. The evaluation of integrity must be judged with reference to the particular criterion or criteria under which a resource may be eligible for the California Register. However, the implementing regulations specifically caution that alterations of a historic resource over time may themselves have historical, cultural or architectural significance.

Most often, historical resources will be 50 years old or older. However, a resource less than fifty (50) years old may be considered for listing in the California Register if it can be demonstrated that sufficient time has passed to recognize its historical importance. If an archaeological resource does not meet the definition of a historical resource, it may meet the definition of a "unique archaeological resource" under Public Resource Code §21083.2. An archaeological resource is "unique" if it:

1. Is associated with an event or person of recognized significance in California or American history or recognized scientific importance in prehistory;

2. Can provide information that is of demonstrable public interest and is useful in addressing scientifically consequential and reasonable research questions;

3. Has a special or particular quality such as oldest, best example, largest, or last surviving example of its kind;

4. Is at least 100 years old and possesses substantial stratigraphic integrity;

5. Involves important research questions that can be answered only with archaeological methods.

Paleontological Resources

No paleontological resources were identified during the field inspection, nor were any previous finds reported in the database search specifically at the proposed storage tank locations or along the proposed

pipeline. However, the database search did conclude that one of reported fossil localities (V92081) is within the project vicinity.

Prehistoric/Historic Archaeological Resources

No prehistoric or historic archaeological resources were identified along the pipeline route or at the three proposed water storage tank locations.

Buildings/Structures

Bridge No. 28C0258 (O'Hara Avenue and Sand Creek Road at Marsh Creek Bridge)

According to the listing of historical significance-Local Agency Bridges, the California Department of Transportation's (Caltrans) August 2013 Structure Maintenance & Investigations show that the O'Hara Avenue at Marsh Creek Bridge is not eligible for the National Register of Historic Places. The bridge does not appear to have been evaluated for California Register of Historical Resources eligibility. However, the bridge was constructed in 2002. Most often, historical resources (eligible for listing) will be 50 years old or older.

Bridge No. 28C0399 (Sand Creek Road at Sand Creek Bridge)

The Caltrans listing of Historical Significance-Local Agency Bridges of August 2013 indicates that the bridge was constructed in 1966, but widened/extended in 2002. The listing states that the bridge is not eligible for the National Register of Historic Places. The bridge does not appear to have been evaluated for California Register eligibility, although it is just under 50 years old and it was altered in 2002 according to the Caltrans listing.

P-07-000813 (Southern Pacific aka Central Pacific or San Pablo-Tulare Railroad)

The old San Pablo-Tulare Railroad was identified by the Northwest Information Center as crossing the proposed pipeline route on Sand Creek Road. However, the Office of Historic Preservation's Directory of Properties in the Historic Property Data File for Contra Costa County dated April 5, 2012 and provided by the information center had no listing for the railroad. Either this particular segment of the railroad has not been evaluated for National Register and/or California Register eligibility, or the railroad segment has been deemed eligible (or not eligible) for listing after the date of the directory printout provided by the information center. In either case, a cultural resource can be considered eligible for one or both registers until eligibility is established by legal authority.

POTENTIAL EFFECT

Under current CEQA regulations, "A project with an effect that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment [Public Resources Code §15064.5(b)]. The significance of a historical resource is materially impaired when a project demolishes or materially alters in an adverse manner those physical characteristics of a resource that convey its historical significance, unless the evidence demonstrates that

the resource is not historically or culturally significant [Public Resources Code §15064.5(b)(2)(A-C)].

Current plans call for the use of existing pipelines for the transmission of recycled water along San Creek Road at Marsh Creek (Bridge No. 28C0258) and at the Sand Creek-Sand Creek Road/Fairview Avenue intersection (Bridge No. 28C0399). In addition, current plans call for the use of an existing pipeline for the transmission of recycled water under the railroad (P-07-000813). Therefore, the proposed project will have no adverse effect on either of the two bridges or the railroad.

However, ground disturbing activities associated with the proposed project do have the potential to adversely impact buried archaeological and unique paleontological resources. Along Fairview Road, trenching may encounter fossils in the geologic Qtu gravel unit.

Ground disturbing activities may also impact buried archaeological resources, as the lack of surface indications does not always insure that there will be no buried archaeological sites, features or objects of significance.

RECOMMENDATIONS

The following measures are recommended to reduce any impacts to historical resources and unique paleontological resources to a less than significant level:

1. A qualified professional paleontologist shall periodically monitor excavation for the proposed pipeline along Fairview Avenue to check for fossils that may be unearthed in the Qtu gravel unit.

2. If vertebrate fossils (*e.g.*, teeth, bones) are unearthed by the construction crew anywhere on the project, the finds should be set aside and all excavation activity cease at the specific place of discovery until the paleontologist has assessed the find and, if deemed significant, salvaged the find in a timely manner. Work may proceed on other parts of the project while assessment and/or salvage by the paleontologist is underway. Finds determined significant by the paleontologist shall be conserved and deposited with a recognized repository such as the University of California Museum of Paleontology.

3. In the event of the accidental discovery or recognition of any human remains, there shall be no further excavation or disturbance of the find or any nearby area reasonably suspected to overlie adjacent human remains, until compliance with the provisions of §15064.5(e)(1) and (2) of the CEQA Guidelines has occurred. The Guidelines specify that in the event of the discovery of human remains other than in a dedicated cemetery, the county coroner must be notified to determine if an investigation into the cause of death is required. If the coroner determines that the remains are Native American, then, within 24 hours, the coroner must notify the Native American Heritage Commission, which in turn will notify the most likely descendant who may recommend treatment of the remains and any grave goods. If the Native American Heritage Commission is unable to identify a most likely descendant or the most likely descendant fails to make a recommendation within 24 hours after notification by the Native American Heritage Commission, or the landowner or his authorized agent rejects the recommendation by the most likely descendant and mediation by the Native American Heritage Commission fails to provide a measure acceptable to the landowner, then the landowner or his authorized representative shall rebury the human remains and grave goods with appropriate dignity at a location on the property not subject to further disturbances.

4. If any prehistoric or historic artifacts, or other indications of archaeological resources such as unusual deposits of stone, bone or shell, stone artifacts, or historic trash deposits or foundations are discovered once ground-disturbing activities are underway, the find(s) shall be immediately evaluated by a qualified archaeologist. If the find is determined to be a historical or unique archaeological resource, contingency funding and a time allotment to allow for implementation of avoidance measures or appropriate mitigation shall be made available, as provided in §15064.5 of the CEQA Guidelines. Work may continue on other parts of the project site while historical or unique archaeological resource mitigation takes place on-site.

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APPENDIX A: PHOTOGRAPHS

Figure 5. Looking southwest across proposed storage tank site at Roddy Ranch Pump Station location. Fairview Avenue is in the background.

Figure 6. Looking north along east side of Fairview Avenue at vacant land from the southeast corner of Fairview and Central.

Figure 7. Looking west along Sand Creek Road towards Fairview Avenue.

Figure 8. Looking north across south location for storage tank towards the north location of storage tank at wastewater treatment plant.

APPENDIX B: RECORDS SEARCH RESULTS

This appendix may contain information on the specific locations of archaeological resources. This information is not for publication or release to the general public. It is for planning, management and research purposes only. Information on the locations of prehistoric and historic sites are exempted from the California Freedom of Information Act, as specified in Government Code §6254.10.

APPENDIX C

Biological Resources Data

Table C-1. Brentwood Project Site Descriptions.

Project Site	Site Description	Soils (NRCS 2014)	Sensitive Habitats (waters/wetlands or riparian habitat)
Roddy Ranch Recycled Water Storage Tank Location	This is a disturbed, flat site with annual grassland habitat and approximately 30% bare ground. There are ornamental shrubs and trees in surrounding residential and street-side landscaping, as well as scattered coyote bush (*Baccharis pilularis*) and rabbit bush (*Ericameria* sp.). Surrounding areas are mostly developed residential.	Soils are classified as Rincon clay loam, which are well-drained alluvial soils.	There are no sensitive habitats the Project area at this site. Outside of the Project area, just to the south of and adjacent to the tank location, there is a small grove of Fremont cottonwoods (*Populus fremontii*) and a patch of emergent wetland vegetation characterized by dense cattails (*Typha* sp.) and bulrush (*Schoenoplectus* sp.) in Dry Creek, a seasonal tributary to Marsh Creek.
WWTP Recycled Water Storage Tank Location 1	This is a disturbed, flat site with coastal scrub and annual grassland habitat. The site has approximately 50-60% bare ground. Surrounding areas are typically agricultural and disturbed barren ground.	Site has Delhi sand soils, which are extremely well-drained and composed of eolian deposits derived from igneous and sedimentary rock. These are the same wind-deposited soils that form the nearby Antioch Dunes.	This site has sand deposits, which are identified as an uncommon landscape feature in the ECC HCP/NCCP. There are no other sensitive habitats in the Project area at this site. Marsh Creek at the current effluent discharge location is approximately 250 feet northwest of the tank site.
WWTP Recycled Water Storage Tank Location 2	This is a disturbed, flat site with annual grassland habitat and less that 5% bare ground. Surrounding areas are typically agricultural and disturbed barren ground.	Soils are classified as Rincon clay loam, which are well-drained alluvial soils.	There are no sensitive habitats in the Project area at this site. There is a small grove of Fremont cottonwoods located just to the east of this site, outside of the Project area.
Proposed Recycled Water Pipeline Alignment	The proposed pipeline alignment follows Fairview Ave. and Sand Creek Rd., crossing mainly residential and commercial areas. The alignment also crosses some undeveloped parcels with annual grassland habitat.	Soils along the pipeline alignment include Capay clay, Brentwood clay loam, and Sycamore silty clay loam.	The alignment crosses two creeks: 1) Sand Creek at the intersection of Fairview Ave. and Sand Creek Rd. and 2) Marsh Creek at the intersection of Sand Creek Rd. and O'Hara Ave.. The pipeline is already installed at these portions of the alignment so no work is proposed within jurisdictional stream banks.
Lower Marsh Creek Below Current Effluent Discharge Site	Treated WWTP effluent is discharged year-round into Marsh Creek, a perennial stream that flows approximately 3.5 miles from the current discharge location at the WWTP to its confluence with the Sacramento-San Joaquin River Delta at Big Break. Areas surrounding the creek corridor are typically agricultural, barren ground, and residential. Portion just below discharge site: The first approximately 3 miles north of the effluent discharge location is channelized by levees on both banks and vegetated with mostly non-native herbaceous vegetation, and no shrub or tree cover. The creek banks, including streamside vegetation, are actively managed by the Contra Costa County Flood Control and Water Conservation District for flood control maintenance. Tidally-influenced portion of lower Marsh Creek: The final approximate 0.3 mile of Marsh Creek near its intersection with the delta is tidally-influenced. This tidally-influenced portion of lower Marsh Creek has an established but discontinuous riparian tree and shrub cover characterized by willows (*Salix* sp.), Fremont cottonwoods, and Hind's walnut (*Juglans Hindsii*).	Soils along the creek are mostly alluvial and include Piper loamy sand, Ryde silt loam, Sacramento clay, and Sycamore silty clay loam.	This portion of the Project area consists of the bed and bank of Marsh Creek.

Table C-2. Vegetation Communities and Wildlife Habitats.

CNPS Vegetation Community/Alliance	CWHR Wildlife Habitat	Characteristic Species	Brentwood Recycled Water Project Components					
			Roddy Ranch Recycled Water Storage Tank Location	WWTP Recycled Water Storage Tank Location 1	WWTP Recycled Water Storage Tank Location 2	Proposed Recycled Water Pipeline Alignment	Lower Marsh Creek Below Current Effluent Discharge Site	Tidally-Influenced Portion of Lower Marsh Creek Below Current Effluent Discharge Site
Tree-Dominated Communities								
Hinds's walnut and related stands (*Juglans hindsii* and Hybrids Semi-Natural Woodland Stands)	Valley Foothill Riparian	Hind's walnut (*Juglans hindsii*), willow (*Salix* sp.), Fremont cottonwood (*Populus fremontii*), giant reed (*Arundo donax*), Himalayan blackberry (*Rubus armeniacus*)						x
Fremont cottonwood stand (*Populus fremontii* Forest Alliance)	Valley Foothill Riparian	Fremont cottonwood	x		x			
Shrub-Dominated Communities								
Bush lupine scrub (*Lupinus* sp. Shrubland Alliance)	Coastal Scrub	Bush lupine (*Lupinus* sp.), telegraphweed (*Heterotheca grandiflora*)		X				
Herb-Dominated Communities								
Various Semi-Natural Herbaceous Alliances	Annual Grassland	Yellow starthistle (*Centaurea solstitialis*), wild oats (*Avena* sp.), bermuda grass (*Cynodon dactylon*), bindweed (*Convolvulus arvensis*), tarweed (*Holocarpha heermannii*),	X	X	X	X	x	x
Bulrush/Cattail Marsh (*Schoenoplectus* sp. /*Typha* sp. Alliances)	Fresh Emergent Wetland	Bulrush (*Schoenoplectus* sp.), cattail (*Typha* sp.), Himalayan blackberry, rush (*Juncus* sp.), cheeseweed (*Malva parviflora*), spearmint (*Menta spicata*)	x			x	X	
Bulrush Marsh (*Schoenoplectus* sp. Alliance)	Saline Emergent Wetland	Bulrush, cattail, willow, water hyacinth (*Eichhornia crassipes*)						X
Non-vegetated areas								
N/A	Barren/Ruderal	N/A	x	x	x	X	X	x
N/A	Urban	N/A	x	x	x	X	x	x
Aquatic								
N/A	Riverine	N/A				x	X	

N/A	Estuarine	N/A						X

X = Vegetation community/wildlife habitat in Project area
x = Vegetation community/wildlife habitat adjacent to or surrounding Project area.

Table C-3. Potentially Occurring Special-Status Plant Species.

Scientific and Common Name	Federal Status	State Status	Habitat	Potential for Occurrence in Project Area	ECCC HCP/NCCP Coverage
Large-flowered fiddleneck *Amsinckia grandiflora*	FE	SE CNPS 1B.1	Grassy slopes below 1,000 feet in the San Joaquin Valley.	Potential for occurrence in annual grasslands within the Project area.	No Take
slender silver moss *Anomobryum julaceum*	-	CNPS 2B.2	Forest floor, damp rock and soil on outcrops; usually on roadcuts. 300 – 3,300 feet.	Unlikely to occur as no appropriate habitat is present.	None
Mount Diablo manzanita *Arctostaphylos auriculata*	-	CNPS 1B.3	Sandstone, upland chaparral near coast; from 450–2100 feet elevation in the San Francisco Bay Area (Mount Diablo and vicinity)	Unlikely to occur. Outside of species geographic and elevational range; not modeled as potential habitat in the ECCC HCP/NCCP (Jones and Stokes 2006).	Covered
Contra Costa County manzanita *Arctostaphylos manzanita* ssp. *laevigata*	-	CNPS 1B.2	Chaparral, rocky outcrops from 700–3600 feet	Unlikely to occur. Project is below this species' geographic range.	None
Ferris' milkvetch *Astragalus tener* var. *ferrisiae*	-	CNPS 1B.1	Vernally moist meadows and seeps in valley and foothill grassland, subalkaline flats, and alkaline flats; below 250 feet.	Potential for occurrence in areas with spring moisture within annual grassland habitats in the Project area.	None
Alkali milkvetch *Astragalus tener* ssp. *tener*	-	CNPS 1.B2	Alkaline flats and vernally moist meadows below 200 feet.	Potential for occurrence in areas with spring moisture within annual grassland habitats in the Project area.	No Take
Heartscale *Atriplex cordulata*	-	CNPS 1.B2	Valley grassland, wetland, riparian, or scrub areas below 1,000 feet.	Potential for occurrence in annual grasslands or coastal scrub habitat within the Project area.	None
Brittlescale *Atriplex depressa*	-	CNPS 1.B2	Alkaline or clay soils in valley grassland, wetland, riparian, or scrub areas below 1,000 feet.	Potential for occurrence in annual grasslands or coastal scrub habitat within the Project area.	Covered
San Joaquin spearscale *Atriplex (Extriplex) joaquiniana*	-	CNPS 1B.1	Alkaline soils below 2,700 feet.	Potential for occurrence in annual grasslands or coastal scrub habitat within the Project area.	Covered
Big tarplant *Blepharizonia plumosa*	-	CNPS 1B.1	Dry slopes in grassland below 1,600 feet.	Potential for occurrence in annual grasslands within the Project area.	Covered
watershield *Brasenia schreberi*	-	CNPS 2B.3	Slow moving water in wetlands, marshes, and ponds below 7,000 feet.	Unlikely to occur as no appropriate habitat is present.	None
Round-leaved filaree *California (Erodium) macrophylla*	-	CNPS 1B.1	Clay soils in cismontane woodland and valley/foothill grassland <4,000 feet.	Potential for occurrence in annual grasslands within the Project area.	Covered

Scientific and Common Name	Federal Status	State Status	Habitat	Potential for Occurrence in Project Area	ECCC HCP/NCCP Coverage
Mount Diablo fairy lantern *Calochortus pulchellus*	-	CNPS 1B.2	Wooded slopes, generally northern aspect; 600-2,700 feet.	Unlikely to occur. Project is outside of species elevational range and no appropriate habitat is present.	Covered
Bristly sedge *Carex comosa*	-	CNPS 2B.1	Wet places, such as marshes and swamps, below 2050 feet in valley and foothill grassland .	Unlikely to occur as no appropriate habitat is present.	None
Congdon's spikeweed *Centromadia parryi* ssp. *congdonii*	-	CNPS 1B.1	Below 1000 feet in floodplains, grasslands, and disturbed sites with alkaline soils.	Potential for occurrence in annual grasslands within the Project area.	None
Bolander's water-hemlock *Cicuta maculata var. bolanderi*	-	CNPS 2B.1	Coastal wetlands, including the marshes around the Suisun Bay.	Potential for occurrence in the tidally-influenced portion of Marsh Creek near its confluence with San Joaquin River.	None
Soft bird's-beak *Chloropyron molle molle (Cordylanthus mollis mollis)*	FE	SR CNPS 1B.2	Coastal salt marshes; below 30 feet elevation.	Potential for occurrence in the tidally-influenced portion of Marsh Creek near its confluence with San Joaquin River.	None
Mount Diablo bird's-beak *Cordylanthus nidularius*	-	SR CNPS 1B.1	Dry, open serpentine in chaparral on the eastern slope Mount Diablo; 1900–2600 feet.	Unlikely to occur. Project is outside of species elevational range and no appropriate habitat is present.	None
Hoover's cryptantha *Cryptantha hooveri*	-	1A	Inland dunes below 500 feet.	Unlikely to occur. Extirpated in California. Historic records for this species in Contra Costa County.	None
Livermore tarplant *Deinandra bacigalupii*	-	1B.2	Alkaline meadows and seeps in the Livermore Valley, from 300–700 feet.	Unlikely to occur. Project area is outside of this species elevational and geographic range.	None
Hospital Canyon larkspur *Delphinium californicum* ssp. *interius*	-	CNPS 1.B2	Poorly drained, fine, alkaline soils in grasslands below 2,000 feet. Slopes in foothill woodland on the eastern side of the coast ranges between 900–4000 feet.	Unlikely to occur. Project area is outside of this species elevational range.	None
Recurved larkspur *Delphinium recurvatum*	-	CNPS 1B.2	Poorly drained, fine, alkaline soils in grassland, *Atriplex* scrub; <2,000 feet.	Unlikely to occur as no appropriate habitat is present. Project area does not contain modeled suitable habitat (Jones and Stokes 2006).	Covered
Dwarf downingia *Downingia pusilla*	-	CNPS 2.2	Moist sites and vernal pools in valley and foothill grassland below 1,600 feet.	Unlikely to occur as no appropriate habitat is present.	None
Antioch Dunes buckwheat *Eriogonum nudum var. psychicola*	-	CNPS 1B.1	Inland dunes and sandy soils; Below 100 feet. Deltaic Great Central Valley.	Potential for occurrence on sandy soils at WWTP recycled water storage tank location 1.	None
Mount Diablo buckwheat *Eriogonum truncatum*	-	CNPS 1B.1	Sand; 600–1300 feet	Unlikely to occur. Project area is outside of this species elevational range.	No Take
Delta button-celery *Eryngium racemosum*	-	SE CNPS 1B.1	Seasonally flooded clay depressions in floodplains below 100 feet.	Potential for occurrence in annual grasslands within the Project area.	None

Scientific and Common Name	Federal Status	State Status	Habitat	Potential for Occurrence in Project Area	ECCC HCP/NCCP Coverage
spiny-sepaled button-celery *Eryngium spinosepalum*	-	CNPS 1B.2	Vernal pools, swales, roadside ditches; 100–1270 m	Unlikely to occur. Project area is outside of this species elevational range.	None
Contra Costa wallflower *Erysimum capitatum capitatum (angustatum)*	-	SE CNPS 1B.1	Known only from the Antioch Dunes, which are considered USFWS Critical Habitat.	Potential for occurrence on sandy soils at WWTP recycled water storage tank location 1.	None
Diamond-petaled poppy *Eschscholzia rhombipetala*	-	CNPS 1B.1	Open areas and grasslands below 1,000 feet.	Potential for occurrence in annual grasslands within the Project area.	No Take
Fragrant fritillary *Fritillaria liliacea*	-	CNPS 1B.2	Open fields near the coast below 700 feet.	Potential for occurrence in annual grasslands within the Project area.	None
Diablo helianthella *Helianthella castanea*	-	CNPS 1B.2	Open grassy sites from 600-4,300 feet.	Unlikely to occur as Project area is below species' elevational range. Project area does not contain modeled suitable habitat (Jones and Stokes 2006).	Covered
Brewer's dwarf flax *Hesperolinon breweri*	-	CNPS 1B.2	Serpentine soils in woodland, grassland, and chaparral habitats.	Unlikely to occur as no appropriate habitat is present. Project area does not contain modeled suitable habitat.	Covered
Woolly rose-mallow *Hibiscus lasiocarpus*	-	CNPS 1B.2	Freshwater wetlands, wet banks, and marshes <400 feet.	Unlikely to occur as no appropriate habitat is present.	None
Carquinez goldenbush *Isocoma arguta*	-	CNPS 1B.1	Valley grasslands and alkaline flats below 65 feet in elevation.	Potential for occurrence in annual grasslands within the Project area.	None
Contra Costa goldfields *Lasthenia conjugens*	FE	CNPS 1B.1	Vernal pools and wet meadows in valley grasslands.	Unlikely to occur as no appropriate habitat is present.	No Take
Delta tule pea *Lathyrus jepsonii* ssp. *jepsonii*	-	CNPS 1B.2	Marshes and swamps (freshwater and brackish) in the Central Valley below 100 feet.	Potential for occurrence in the tidally-influenced portion of Marsh Creek near its confluence with San Joaquin River.	None
Mason's lilaeopsis *Lilaeopsis masonii*	-	SR CNPS 1B.1	Marshes and swamps (brackish or freshwater), streambanks, or riparian scrub below 150 feet.	Potential for occurrence in the tidally-influenced portion of Marsh Creek near its confluence with San Joaquin River.	None
Delta mudwort *Limosella australis*	-	CNPS 1B.2	Muddy or sandy intertidal flats (brackish water) below 50 feet.	Potential for occurrence in the tidally-influenced portion of Marsh Creek near its confluence with San Joaquin River.	None
Welsh mudwort *Limosella australis*	-	CNPS 2B.1	Freshwater or brackish marshes.	Potential for occurrence in the tidally-influenced portion of Marsh Creek near its confluence with San Joaquin River.	None
Showy madia *Madia radiata*	-	CNPS 1B.1	Grassy or open slopes, generally clayey soils or shale.	Potential for occurrence in annual grasslands within the Project area.	Covered
Hall's bush mallow *Malacothamnus hallii*	-	CNPS 1B.2	Open chaparral below 2,500 feet.	Unlikely to occur as no appropriate habitat is present.	None
Little mousetail *Myosurus minimus* ssp. *apus*	-	CNPS 3.1	Vernal pools.	Unlikely to occur as no appropriate habitat is present.	None

Scientific and Common Name	Federal Status	State Status	Habitat	Potential for Occurrence in Project Area	ECCC HCP/NCCP Coverage
Adobe navarretia *Navarretia nigelliformis* ssp. *nigelliformis*	-	CNPS 4.2	Vernally mesic areas, including vernal pools and clay depressions, in valley and foothill grassland between 300 and 3,300 feet.	Unlikely to occur as no appropriate habitat is present.	None
shining navarretia *Navarretia nigelliformis* ssp. *radians*	-	CNPS 1B.2	Vernal pools.	Unlikely to occur as no appropriate habitat is present.	None
Colusa grass *Neostapfia colusana*	FT	SE CNPS 1B.1	Vernal pools.	Unlikely to occur as no appropriate habitat is present.	None
Antioch Dunes evening primrose *Oenothera deltoides ssp. howellii*	FE	SE CNPS1B.1	Sandy bluffs, dunes below 100 meters in the Deltaic Great Central Valley (Antioch and Contra Costa Counties).	Potential for occurrence on sandy soils at WWTP recycled water storage tank location 1.	None
Mount Diablo phacelia *Phacelia phacelioides*	-	CNPS 1B.2	Open rocky slopes in chaparral and foothill woodland from 1,600-5,000 feet.	Unlikely to occur as no appropriate habitat is present and Project area is below this species' elevational range.	None
Bearded popcorn-flower *Plagiobothrys hystriculus*	-	CNPS 1B.1	Vernal pools.	Unlikely to occur as no appropriate habitat is present.	None
eel-grass pondweed *Potamogeton zosteriformis*	-	CNPS 2B.2	Freshwater ponds, lakes, and streams.	Unlikely to occur as no appropriate habitat is present.	None
Rock sanicle *Sanicula saxatilis*	-	SR CNPS1B.2	Rocky areas in chaparral or woodland from 2,900-3,600 feet.	Unlikely to occur as no appropriate habitat is present and Project area is below this species' elevational range.	None
Marsh skullcap Scutellaria galariculata	-	CNPS 2.2B	Wet sites, meadows, streambanks, conifer forest; 3,200–6,900 feet.	Unlikely to occur as no appropriate habitat is present and Project area is below this species' elevational range.	None
Side-Flowering skullcap Scutellaria lateriflora	-	CNPS 1B.2	Marshes, wet meadows below 1,700 feet.	Unlikely to occur as no appropriate habitat is present.	None
Rayless ragwort Senecio aphanactis	-	CNPS 2B.2	Dry, open rocky areas below 1,800 feet.	Potential for occurrence in annual grasslands or coastal scrub habitat within the Project area.	None
Keck's checkerbloom Sidalcea keckii	FE	CNPS 1B.1	Grassy slopes above 250 feet elevation.	Unlikely to occur Project area is below this species' elevational range.	None
Most-beautiful jewelflower *Streptanthus albidus* ssp. *peramoenus*	-	CNPS 1B.2	Rocky, serpentine, open areas, on barren slopes from 490-4,500 feet.	Unlikely to occur as no appropriate habitat is present and Project area is below this species' elevational range.	None
Mount Diablo jewelflower Streptanthus hispidus	-	CNPS 1B.3	Chaparral and grasslands from 1,900-4,000 feet.	Unlikely to occur as the Project area is below this species' elevational range.	None
Suisun Marsh aster Symphyotrichum lentum	-	CNPS 1B.2	Brackish and freshwater marshes and swamps below 900 feet.	Potential for occurrence in the tidally-influenced portion of Marsh Creek near its confluence with San Joaquin River.	None
Caper-fruited tropidocarpum *Tropidocarpum capparideum*	-	CNPS 1B.1	Alkaline soils in valley grasslands below 1,400 feet.	Potential for occurrence in annual grasslands within the Project area.	No Take

Scientific and Common Name	Federal Status	State Status	Habitat	Potential for Occurrence in Project Area	ECCC HCP/NCCP Coverage
oval-leaved viburnum *Viburnum ellipticum*	-	CNPS 2B.3	Chaparral and yellow pine forest from 900-5,000 feet.	Unlikely to occur as no appropriate habitat is present and Project area is below this species' elevational range.	None

LEGEND:

State Status

CR = California Rare

CT = California Threatened

CE = California Endangered

CNPS = California Native Plant Society

1A=Extirpated in California, rare or extinct Elsewhere

1B = rare, threatened or endangered in California and elsewhere

2B = rare in California but more common elsewhere

3 = need more information

_.1 = Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)

_.2 = Fairly endangered in California (20–80% occurrences threatened)

_.3 = Not very endangered in California (<20% of occurrences threatened or no current threats known)

Federal Status

FC = Candidate Species

FE = Federal Endangered

FT = Federal Threatened

Table C-4. Potentially Occurring Special-Status Wildlife.

Scientific and Common Name	Federal Status	State Status	Habitat	Potential for Occurrence in Project Area	ECCC HCP/NCCP Coverage
Invertebrates					
Conservancy fairy shrimp *Branchinecta conservatio*	FE	-	Vernal pools.	Unlikely to occur. No appropriate habitat (vernal pools) is present in the Project area.	None
Longhorn fairy shrimp *Branchinecta longiantenna*	FE	-	Vernal pools.	Unlikely to occur. No appropriate habitat (vernal pools) is present in the Project area.	Covered
Vernal pool fairy shrimp *Branchinecta lynchi*	FT	-	Vernal pools.	Unlikely to occur. No appropriate habitat (vernal pools) is present in the Project area.	Covered
Midvalley fairy shrimp *Brachinecta mesovallensis*	-	-	Vernal pools.	Unlikely to occur. No appropriate habitat (vernal pools) is present in the Project area.	Covered
Vernal pool tadpole shrimp *Lepidurus packardi*	FE	-	Vernal pools.	Unlikely to occur. No appropriate habitat (vernal pools) is present in the Project area.	Covered
California freshwater shrimp *Syncaris pacifica*	FE	SE		Unlikely to occur. Project is outside of species' geographic range.	None

Scientific and Common Name	Federal Status	State Status	Habitat	Potential for Occurrence in Project Area	ECCC HCP/NCCP Coverage
Delta green ground beetle *Elaphrus viridis*	FT	-	Vernal pools in Solano County.	Unlikely to occur. No appropriate habitat (vernal pools) is present in the Project area. Project is outside of species' geographic range.	None
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	FT	-	Occurs only in the Central Valley of California, in association with blue elderberry (*Sambucus nigra* ssp. *Caerulea*). Prefers to lay eggs in elderberries 2-8 inches in diameter; some preference shown for "stressed" elderberries.	Unlikely to occur as there are no elderberry shrubs in the Project area. Closest known occurrence is approximately 19 miles east of the Project	None
Lange's metalmark butterfly *Apodemia mormo langei*	FE	-	Endemic to the stabilized Antioch Dunes along the San Joaquin River in Contra Costa County. Primary host plant is *Eriogonum nudum* var *auriculatum*.	Unlikely to occur. No appropriate habitat (Antioch Dunes/*Eriogonum nudum* var. *auriculatum*) is present in the Project area. Nearest record consists of a 2008 record in the Antioch Dunes National Wildlife Refuge approximately 3 miles northwest of the Project area.	None
Callippe silverspot butterfly *Speyeria callippe callippe*	FE	-	Found in native grassland and adjacent habitats with their larval food plant, Johnny-jump- up (*Viola pedunculata*). Known only from seven threatened sites in the San Francisco Bay area.	Unlikely to occur. Outside of species remaining, limited range. Closest known occurrence 2009 CNDDB record 22 miles northwest of the Project area near Vallejo.	None
Amphibians					
California tiger salamander *Ambystoma californiense*	FT	-	Occurs primarily in annual grassland habitat, but is also found in the grassy understory of valley-foothill hardwood habitats, and uncommonly along stream courses in valley-foothill riparian habitats below 3,200 feet. Require vernal pools or ponds for breeding. Can disperse up to one mile from their breeding ponds.	Potential for occurrence. According to the East Contra Costa Habitat Conservation Plan (ECCHCP), no modeled habitat is present in the Project Area (Jones and Stokes 2006). However, there are CNDDB occurrences in the Project area vicinity and CTS could potentially be present in grassy areas at proposed recycled water storage tank sites and along portions of proposed pipeline alignment where appropriate habitat is present.	Covered
Western spadefoot toad *Scaphiophus hammondii*	-	CSC	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands. Vernal pools are essential for breeding and egg-laying.	Unlikely to occur. No appropriate habitat is present. The closest breeding habitat (vernal pools) is approximately 1.5 miles south of the Project area, beyond the home range of this species (Zeiner et al 1990).	None
Foothill yellow-legged frog *Rana boylii*	-	CSC	Perennial rocky (pebble or cobble) streams with cool, clear water in a variety of habitats from valley and foothill oak woodland, riparian forest, ponderosa pine, mixed conifer, coastal scrub, and mixed chaparral at elevations below 6,370 feet.	Unlikely to occur. No appropriate habitat is present. No modeled habitat is present in the Project Area (Jones and Stokes 2006).	Covered

Scientific and Common Name	Federal Status	State Status	Habitat	Potential for Occurrence in Project Area	ECCC HCP/NCCP Coverage
California red-legged frog *Rana aurora draytonii*	FT	-	Breeds in aquatic areas with dense, shrubby, or emergent riparian vegetation and a permanent source of deep (greater than 2 1/3 feet deep) still or slow-moving water below 4,000 feet elevation. Upland dispersal within 1 mile of aquatic breeding habitat with no impassable dispersal barriers (suburban areas, suburban developments, wide or fast flowing rivers or streams, lakes greater than 50 acres, and heavily traveled roads without underpasses or culverts).	Unlikely to occur. No appropriate habitat is present. No modeled habitat is present in the Project Area under the ECCCHCP (Jones and Stokes 2006).	Covered
Reptiles					
Western pond turtle *Emys marmorata*	-	CSC	Perennial wetlands and slow moving creeks and ponds, below 6,000 feet in elevation, with overhanging vegetation and suitable basking sites such as logs and rocks above the waterline.	Potential for occurrence in Marsh Creek, and at proposed recycled water storage tank locations that are within this species dispersal range (within 325 feet of permanent water) (Zeiner et al 1990). Several turtles were observed in the tidally influenced portion of lower Marsh Creek during 2014 surveys.	Covered
California horned lizard *Phrynosoma coronatum frontale*	-	CSC	Most common in sandy washes with scattered low bushes, open areas for sunning, bushes for cover, patches of Loose soil, abundant supply of ants, and other insects.	Potential for occurrence in Project area in annual grassland habitats at proposed recycled water storage tank sites and along portions of proposed pipeline alignment. Closest occurrence consists of a 1994 CNDDB record approximately 5 miles south of the Project area.	None
Silvery legless lizard *Anniella pulchra pulchra*	-	CSC	Sandy or loose loamy soils under sparse vegetation, especially in areas with moist soils.	Potential for occurrence in Project area in annual grassland habitats at proposed recycled water storage tank sites and along portions of proposed pipeline alignment. Multiple CNDDB records within 1 mile of Project area.	Covered
San Joaquin whipsnake *Masticophis flagellum ruddocki*	-	CSC	Inhabits open, dry environments with little or no tree cover in valley grassland and saltbrush scrub in the San Joaquin Valley. Mammal burrows are used for refuge and oviposition sites.	Potential for occurrence in Project area in annual grassland habitats at proposed recycled water storage tank sites and along portions of proposed pipeline alignment. Closest known occurrence is a 1981 CNDDB record approximately 6 miles south of the Project area (occ 121).	None
Alameda whipsnake *Masticophis lateralis euryxanthus*	FT	ST	Typically found in chaparral, such as northern coastal sage scrub and coastal sage. Mating and egg-laying occur in grassland habitats adjacent to chaparral habitats in the spring.	Unlikely to occur. Project area does not contain suitable habitat and is not within the modeled habitat distribution for the species (Jones and Stokes 2006).	Covered
Giant garter snake *Thamnophis gigas*	FT	ST	Uses a wide variety of habitats including forests, mixed woodlands, grasslands, chaparral, and agricultural lands. Often occurs near aquatic habitat including ponds, marshes, and streams where it freely enters and retreats to when alarmed.	Potential for occurrence in the Project area in and around lower Marsh Creek, as well as at proposed recycled water storage tank locations. Portions of the Project area in and around Marsh Creek were modeled as Core Habitat and Movement and Foraging Habitat (Jones and Stokes 2006).	Covered

Scientific and Common Name	Federal Status	State Status	Habitat	Potential for Occurrence in Project Area	ECCC HCP/NCCP Coverage
Birds					
Black-footed Albatross (nb) *Phoebastria nigripes*	BCC	-	Off-shore waters of the Pacific.	Unlikely to occur as the Project area is outside of this species' range and no appropriate habitat is present.	None
Pink-footed Shearwater (nb) *Puffinus creatopus*	BCC	-	Off-shore waters of the Pacific.	Unlikely to occur as the Project area is outside of this species' range and no appropriate habitat is present.	None
Black-vented Shearwater (nb) *Puffinus opisthomelas*	BCC	-	Off-shore waters of the Pacific.	Unlikely to occur as the Project area is outside of this species' range and no appropriate habitat is present.	None
Ashy Storm-Petrel *Oceanodroma homochroa*	BCC	-	Off-shore waters of the Pacific.	Unlikely to occur as the Project area is outside of this species' range and no appropriate habitat is present.	None
California brown pelican (nesting colony) *Pelecanus occidentalis californicus*	-	SE	Inhabits estuarine, marine subtidal, and marine pelagic waters along the California coast as far north as the Monterrey Bay.	Unlikely to occur as the Project area is outside of this species' range.	None
Double-crested cormorant (rookery) *Phalacrocorax auritus*	-	CSC	Nests in rocky coastal cliffs. Forages on inland lakes in fresh, salt, and estuarine waters.	Unlikely to occur as the Project area is outside of this species' range and no appropriate habitat is present.	None
American bittern *Botaurus lentiginosus*	-	CSC	Breeds in the Central Valley. Rare wintertime resident or transient in saline emergent wetland areas.	Potential for wintertime foraging in tidally-influenced portion of lower Marsh Creek.	None
White-faced ibis (rookery site) *Plegadis chihi*	-	CSC	In southern California and occasionally the Central Valley, feeds in fresh emergent wetland, shallow lacustrine waters, muddy ground of wet meadows, and irrigated or flooded pastures and croplands. Nests in dense, fresh emergent wetland.	Unlikely to occur as the Project area is outside of this species' range.	None
Redhead *Aythya americana*	-	CSC	Nests in fresh emergent wetland bordering open water. Forages in shallow open water.	Potential for foraging in lower Marsh Creek. Unlikely to nest in Project area as no appropriate habitat is present.	None
Bufflehead *Bucephala albeola*	-	CSC	Common winter resident in coastal estuarine waters or lacustrine habitats.	Potential for wintertime foraging in tidally-influenced portion of lower Marsh Creek.	None
Greater white-fronted goose (tule) *Anser albifrons elgasi*	-	CSC	Nests in the Cook Inlet, Alaska. Winters in the Sacramento and Suisun marsh areas in moist and wet grasslands, agricultural areas, and emergent wetlands.	Potential for winter foraging in lower Marsh Creek and in the vicinity of proposed recycled water storage tank sites.	None
Golden eagle (nesting and wintering) *Aquila chrysaetos*	BGPA	FP	Grasslands and early successional stages of forest and shrub habitats for foraging at elevations up to 11,500 feet. Secluded cliffs with overhanging ledges or large trees in open areas with unobstructed view for nesting.	Potential for foraging in Project area in annual grassland habitats at proposed recycled water storage tank sites and along portions of proposed pipeline alignment., and surrounding lower Marsh Creek.	Covered

Scientific and Common Name	Federal Status	State Status	Habitat	Potential for Occurrence in Project Area	ECCC HCP/NCCP Coverage
Swainson's hawk *Buteo swainsoni*	-	CSC	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, & agricultural or ranch lands with groves or lines of trees. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	Potential for foraging and nesting in the Project area. Several CNDDB records in the direct vicinity of the pipeline alignment, water storage tanks, and Marsh Creek.	Covered
White-tailed kite *Elanus leucurus*	-	FP	Rolling foothills and valley margins with scattered oaks & river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	Potential for foraging in the Project area. Unlikely to nest in the Project area as no appropriate habitat is present.	No Take
Ferruginous hawk (wintering) *Buteo regalis*	-	CSC	Winter resident or migrant at low elevations and open grasslands.	Potential for wintertime foraging in Project area at proposed recycled water storage tank sites and along portions of proposed pipeline alignment where appropriate habitat is present.	None
Northern harrier *Circus cyaneus*	-	CSC	Year-round breeding resident in open grasslands and wetlands in the Central Valley. Nesting season extends from April through September.	Potential for foraging or nesting in the Project area and surrounding vicinity where appropriate habitat is present.	None
Bald eagle (nesting and wintering) *Haliaeetus leucocephalus*	FPD/ BGPA/ BCC	SE	Year-round resident in ice-free regions of California. Foraging areas include regulated and unregulated rivers, reservoirs, lakes, estuaries, and coastal marine ecosystems. Majority of bald eagles in California breed near reservoirs and nests are usually located within 1 mile of foraging habitat.	Potential winter migrant in and around Project area where appropriate habitat is present.	None
American peregrine falcon (nesting) *Falco peregrinus*	FD, BCC	SE/FP	Breeds in woodlands, forests, coastal habitats, and riparian areas near wetlands, lakes, rivers, or other water on high cliffs, banks, dunes, or mounds. Migrants occur along the coast and the western Sierra Nevada in spring and fall.	Potential forager or migrant in Project area. Unlikely to nest in the Project area as no appropriate habitat is present.	No Take
California black rail *Laterallus jamaicensis coturniculus*	BCC	ST/FP	Inhabits freshwater marshes, wet meadows & shallow margins of saltwater marshes bordering larger bays. Needs water depths of about 1 inch that does not fluctuate during the year & dense vegetation for nesting habitat.	Potential for occurrence in tidally-influenced portion of lower Marsh Creek.	None
Yellow Rail (nb) *Coturnicops noveboracensis*	BCC		Occurs year round in California, breeding in the northeastern interior and as a winter visitor in the Suisun marsh region.	Potential winter migrant or forager in tidally-influenced portion of lower Marsh Creek.	None
California clapper rail *Rallus longirostris obsoletus*	FE	SE/FP	Forages in saline emergent wetlands and along tidal creeks. Nests in saline emergent wetlands near tidal sloughs. Veg	Potential for foraging or nesting in tidally-influenced portion of lower Marsh Creek.	None

Scientific and Common Name	Federal Status	State Status	Habitat	Potential for Occurrence in Project Area	ECCC HCP/NCCP Coverage
Sora *Porzana carolina*	-	CSC	Forages and breeds in fresh emergent wetlands.	Potential for foraging in lower Marsh Creek. Unlikely to nest in the Project area due to routine vegetation management conducted for flood control along Marsh Creek.	None
Greater sandhill crane (nesting and wintering) *Grus canadensis tabida*	-	ST/FP	This species breeds only in Siskiyou, Modoc, and Lassen counties, and in Sierra Valley, Plumas and Sierra counties. In summer it occurs in and near wet meadow, shallow lacustrine, and emergent wetland habitats. It winters in the Sacramento and San Joaquin valleys, in grassland/cropland habitats and open, emergent wetlands.	Potential winter migrant in and around Project area where appropriate habitat is present.	None
Mountain plover (wintering) *Charadrius montanus*	BCC	CSC	Winter resident from September through March in short grasslands and plowed fields in the Central Valley. Does not breed in California.	Potential winter migrant or forager in annual grassland habitats in the Project area.	None
Snowy Plover *Charadrius nivosus*	BCC	-	Common on sandy marine and estuarine shores in fall and winter.	Potential winter migrant or forager in tidally-influenced portion of lower Marsh Creek.	None
Black Oystercatcher *Haematopus bachmani*	BCC	-	Forages and nests in rocky coastal habitats.	Unlikely to occur in the Project area as no appropriate habitat is present.	None
Short-billed Dowitcher (nb) *Limnodromus griseus*	BCC	-	Spring and fall migrant along coast in intertidal mudflats, including portions of western Contra Costa County.	Unlikely to occur in the Project area as no appropriate habitat is present.	None
Long-billed curlew *Numenius americanus*	BCC	CSC	Breeds from April to September in wet meadow habitat in northeastern California. Potential winter visitant from early July to early April in grasslands and croplands in the Central Valley. Additionally, non-breeders may remain in the Central Valley through the summer.	Potential winter migrant in and around Project area where appropriate habitat is present.	None
Whimbrel (nb) *Numenius phaeopus*	BCC	-	Nests in the arctic. Forages in California on rocky intertidal and sandy beach marine habitats, on the intertidal mudflats of estuarine habitats, and on wet meadow and pasture habitats adjacent to the immediate coast. Occasionally forages on lawns or golf courses. Inland, prefers flooded fields, wet meadows, croplands and the margins of riverine and lacustrine habitat.	Potential spring or fall migrant or wintertime forager in the Project area vicinity.	None
Marbled Godwit (nb) *Limosa fedoa*	BCC	-	Spring and fall migrant along coast in intertidal mudflats, including portions of western Contra Costa County.	Unlikely to occur in the Project area as no appropriate habitat is present.	None
Red Knot (*roselaari* ssp.) (nb) *Calidris canutus*	BCC	-	Breeds in northern Alaska and Canada. Occasional migrant or winter resident in estuarine habitats in the San Francisco Bay area.	Potential winter forager in tidally-influenced portion of lower Marsh Creek.	None

Scientific and Common Name	Federal Status	State Status	Habitat	Potential for Occurrence in Project Area	ECCC HCP/NCCP Coverage
Black Skimmer *Rynchops niger*	BCC	-	Forages and nests at the Salton Sea and occasionally other California coastal estuaries, including the southern tip of the San Francisco Bay.	Unlikely to occur as the Project area is outside of this species' range.	None
California least tern (nesting colony) *Sternula antillarum browni*	FE	SE/FP	Breeding areas include abandoned salt ponds and estuarine shores along the southern San Francisco Bay. Feeds primarily in shallow estuaries or lagoons	Unlikely to occur as the Project area is outside of this species' range and no appropriate habitat is present.	None
Gull-billed Tern *Gelochelidon nilotica*	BCC	-	Breeds in low sandy islets in the Salton Sea and near the Mexican border.	Unlikely to occur. Project area is north of this species' geographic range.	None
Cassin's Auklet *Ptychoramphus aleuticus*	BCC	-	Marine pelagic waters off California.	Unlikely to occur as the Project area is outside of this species' range.	None
Xantus's Murrelet (a) *Synthliboramphus scrippsi*	BCC	-	Channel Islands and islands off Baja.	Unlikely to occur as the Project area is outside of this species' range and no appropriate habitat is present.	None
Yellow-billed Cuckoo *Coccyzus americanus*	BCC FC	SE	Breeds and forages in riparian areas with low woody vegetation in lowland California, especially willow-cottonwood habitat.	Potential for nesting or foraging in tidally-influenced portion of lower Marsh Creek.	None
Short-eared owl (nesting) *Asio flammeus*	-	CSC	Winter migrant or year round breeder in the Central Valley in open areas with tall grasses, brush, or wetlands for cover.	Potential for foraging in Project area and potential for nesting in vicinity of Project area in places with dense vegetation.	None
Western burrowing owl *Athene cunicularia*	BCC	CSC	Open, dry annual or perennial grasslands, deserts & scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	Potential for foraging and nesting in the Project area. Several CNDDB records in the direct vicinity of the pipeline alignment, water storage tanks, and Marsh Creek.	Covered
Flammulated Owl *Psiloscops flammeolus*	BCC	-	Summer resident in coniferous habitats from ponderosa pine to red fir forests from 6,000 to 10,000 feet in elevation; prefers low to intermediate canopy closure. Breeds in the North Coast and Klamath Ranges, Sierra Nevada, and in suitable habitats in mountains in southern California.	Unlikely to occur as the Project area is outside of this species' range and no appropriate habitat is present.	None
Spotted Owl *Strix occidentalis occidentalis* ssp.) (c)	BCC	-	Dense, old growth, multi-layered mixed conifer, redwood, Douglas fir, and oak woodland habitats, from sea level to elevations of approximately 7,600 feet.	Unlikely to occur as no appropriate habitat is present.	None
Vaux's swift *Chaetura vauxi*	-	CSC	Nests in hollow trees and snags in redwoods and Douglas fir habitats. Forages over most habitats, especially rivers and lakes.	Unlikely to occur in Project area as no appropriate habitat is present.	None
Black swift *Cypseloides niger*	BCC	-	Nests in moist crevices or caves on sea cliffs. Forages over a variety of habitats.	Potential for foraging over the Project area.	None

Scientific and Common Name	Federal Status	State Status	Habitat	Potential for Occurrence in Project Area	ECCC HCP/NCCP Coverage
Allen's hummingbird *Selasphorus sasin*	BCC	-	Summer resident and migrant along the California Coast.	Unlikely to occur as the Project area is inland of this species' range.	None
Costa's hummingbird *Calypte costae*	BCC	CSC	Desert, chaparral, and riparian areas, largely in southern California.	Unlikely to occur. Project area is north of this species' geographic range.	None
Belted kingfisher *Ceryle alcyon*	-	CSC	Forages in riparian and aquatic habitats. Nests in ground burrow or tree cavity near water.	Unlikely to occur in Project area as no appropriate habitat is present.	None
Lewis' woodpecker *Melanerpes lewis*	BCC	-	Breeds east of the Sierra Nevada crest in cavity excavated in sycamore, cottonwood, oak, or conifer trees. Winter resident in open oak savannas, broken deciduous and coniferous habitats with sufficient supply of acorns and insects.	Unlikely to occur in the Project area as no appropriate habitat is present.	None
White-headed Woodpecker *Picoides albolarvatus*	BCC	-	Forages and nests in mature montane coniferous forests, including occasionally in the Coast Range.	Unlikely to occur as the Project area is outside of this species' range and no appropriate habitat is present.	None
Nuttall's Woodpecker *Picoides nuttallii*	BCC		Low elevation riparian deciduous and oak habitats.	Unlikely to occur as no appropriate habitat is present.	None
Little willow flycatcher (nesting) *Empidonax trailii brewsteri*		SE	Wet meadows and montane riparian habitats.	Unlikely to occur in Project area as no appropriate habitat is present.	None
Loggerhead shrike *Lanius ludovicianus*	BCC	CSC	Open habitats with scattered trees or other perches in the Central Valley.	Potential winter migrant in and around Project area where appropriate habitat is present.	None
Island Scrub-Jay *Aphelocoma insularis*	BCC	-	Oak woodlands on Santa Cruz Island.	Unlikely to occur as Project is outside of species' geographic range.	None
Yellow-billed Magpie *Pica nuttalli*	BCC	-	Nests in trees; forages in valley foothill hardwood, valley foothill hardwood-conifer, valley foothill riparian, orchard, vineyard, cropland, pasture, and urban habitats.	Potential for foraging in annual grassland habitats in the Project area.	None
California horned lark *Eremophila alpestris*	-	CSC	Forages and nests in open, lowland habitats.	Potential for nesting or foraging in annual grassland habitats in the Project area.	None
Bank swallow (nesting) *Riparia riparia*	-	ST	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, or the ocean to dig nesting hole.	Unlikely to nest in the Project area as no appropriate habitat is present. Potential for foraging over the Project area where appropriate habitat is present.	None
Oak Titmouse *Baeolophus inornatus*	BCC	-	Primarily associated with oak woodlands.	Unlikely to occur in Project area as no appropriate habitat is present.	None
Cactus Wren *Campylorhynchus brunneicapillus*	BCC	-	Desert areas of southern California.	Unlikely to occur. Project area is north of this species' geographic range.	None
Swainson's thrush *Catharus ustulatus*	-	CSC	Breeds and forages near water in wooded riparian habitat.	Unlikely to occur in Project area as no appropriate habitat is present.	None

Scientific and Common Name	Federal Status	State Status	Habitat	Potential for Occurrence in Project Area	ECCC HCP/NCCP Coverage
Leconte's Thrasher *Toxostoma lecontei*	BCC	-	Desert habitats in southern California.	Unlikely to occur as the Project area is outside of this species' range and no appropriate habitat is present.	None
Saltmarsh common yellowthroat *Geothlypis trichas sinuosa*	BCC	CSC	Requires extensive wetlands with adjacent riparian thickets. Breeding range includes portions of western Contra Costa County along the coast of the San Pablo Bay.	Unlikely to occur. Project area is outside of this species' geographic range and no appropriate habitat is present.	None
Yellow Warbler *Setophaga petechia* (*brewsteri*ssp.)	BCC	-	Breeds in riparian woodlands from coastal and desert lowlands at elevations below 8,000 feet. Also breeds in montane chaparral, open ponderosa pine, and mixed conifer habitats with substantial amounts of brush.	Unlikely to occur as the Project area is outside of this species' range and no appropriate habitat is present.	None
Spotted Towhee *Pipilo maculates* (*clementae* ssp.)	BCC	-	Channel Islands.	Unlikely to occur as the Project area is outside of this species' range.	None
Grasshopper sparrow *Ammodramus savannarum*	-	CSC	Forages and nests in dense grasslands on rolling hills, lowland plains, in valleys & on hillsides on lower mountain slopes. Favors native grasslands with a mix of grasses, forbs & scattered shrubs. Loosely colonial when nesting. Nests are built of grasses and forbs in slight depression on ground.	Potential for foraging and nesting in Project area at proposed recycled water storage tank sites and along portions of proposed pipeline alignment where appropriate habitat is present.	None
Bell's sage sparrow (nesting) *Amphispiza belli belli*	-	CSC	Dry chaparral and coastal sage shrub habitats.	Unlikely to occur. No appropriate habitat is present.	None
Suisun song sparrow *Melospiza melodia maxillaris*	BCC	CSC	Year round range is confined to tidal salt and brackish marshes fringing the Carquinez Strait and Suisun Bay east to Antioch.	Potential for occurrence in tidally-influenced portion of lower Marsh Creek.	None
Alameda song sparrow *Melospiza melodia pusillula*	BCC	CSC	Year round range is confined to tidal salt and brackish marshes fringing the San Francisco Bay.	Unlikely to occur as the Project area is outside of this species' range.	None
San Pablo song sparrow *Melospoza melodia samuelis*	BCC	CSC	Year round range is confined to tidal salt and brackish marshes fringing the San Pablo Bay.	Unlikely to occur as the Project area is outside of this species' range.	None
Black-chinned Sparrow *Spizella atrogularis*	BCC	-	Breeds and forages in the foothills bordering the Central Valley in brushy, dense chaparral.	Unlikely to occur as the Project area is outside of this species' range and no appropriate habitat is present.	None

Scientific and Common Name	Federal Status	State Status	Habitat	Potential for Occurrence in Project Area	ECCC HCP/NCCP Coverage
Tricolored blackbird (nesting colony) *Agelaius tricolor*	BCC	CSC	Highly colonial species, most numerous in the Central Valley & vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and a foraging area with insect prey within a few miles of the colony. Nests in emergent wetlands with dense vegetation. Forages on ground in grassland or cropland habitats.	Potential for foraging in the Project area at proposed recycled water storage tank sites, along portions of proposed pipeline alignment where appropriate habitat is present, and in the vicinity of lower Marsh Creek. Project area contains modeled suitable foraging habitat (Jones and Stokes 2006). Potential for nesting in tidally influenced portion of lower Marsh Creek.	Covered
Lawrence's goldfinch *Carduelis lawrencei*	BCC	-	Nests in trees and shrubs in valley foothill woodlands, near water. Forages in herbaceous habitats.	Potential for foraging at annual grassland habitats in the Project area.	None
Mammals					
Suisun ornate shrew *Sorex ornatus sinuosus*	-	CSC	Northern shores of San Pablo and Suisun bays.	Unlikely to occur. Project area is outside of this species geographic range.	None
Townsend's western big-eared bat *Corynorhinus townsendii townsendii*	-	CSC	Throughout California in a wide variety of habitats. Most common in mesic sites. Roosts in the open, hanging from walls & ceilings. Roosting sites limiting. Extremely sensitive to human disturbance.	Potential for foraging in the Project area in lower Marsh Creek. Unlikely to roost in the Project area as no appropriate roosting habitat is present. Closest known record consists of a 1991 CNDDB record approximately 20 miles south of the project near Livermore.	Covered
Western red bat *Lasiurus blossevillii*	-	CSC	Potential year-round resident. Roosts in foliage of large shrubs and trees near forests, rivers, fields and urban areas.	Potential for foraging in the Project area in lower Marsh Creek. Unlikely to roost in the Project area as no appropriate roosting habitat is present. The closest known occurrence consists of a 1998 CNDDB record approximately 5 miles west of the Project area.	None
Pallid bat *Antrozous pallidus*	-	CSC	Deserts, grasslands, shrublands, woodlands & forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	Potential for foraging in annual grasslands in the Project area. Unlikely to roost in the Project area as no appropriate roosting habitat is present. The closest known occurrence consists of a 1929 CNDDB record approximate 9 miles southwest of the Project area.	None
Greater western mastiff bat *Eumops perotis*	-	CSC	Potential year-round resident. Roosts in rock crevices or buildings.	Potential for foraging in the Project area in lower Marsh Creek. Unlikely to roost in the Project area as no appropriate roosting habitat is present. Closest known record is approximately 21 miles southeast of the project.	None
Riparian brush rabbit *Sylvilagus bachmani riparius*	FE	SE	Yearlong resident of dense, brushy areas, and of early successional stages of oak and conifer habitats. The *riparius* subspecies is found only at Caswell Memorial State Park on the Stanislaus River in San Joaquin County.	Unlikely to occur. Project area is outside of this species geographic range.	None
San Francisco dusky-footed woodrat *Neotoma fuscipes annectens*	-	CSC	Forest and shrubland habitats with moderate canopy and year-round cover in the San Francisco Bay area.	Unlikely to occur as no appropriate habitat is present in the Project area. Closest known occurrence is a 2006 CNDDB record approximately 10 miles southwest of the Project area.	None

Scientific and Common Name	Federal Status	State Status	Habitat	Potential for Occurrence in Project Area	ECCC HCP/NCCP Coverage
Riparian woodrat *Neotoma fuscipes riparia*	FE	-	Yearlong resident of riparian woodlands with abundant dead branches and downed woody material. The *riparia* subspecies is found only at Caswell Memorial State Park on the Stanislaus River in San Joaquin County.	Unlikely to occur. Project area is outside of this species geographic range.	None
Saltmarsh harvest mouse *Reithrodontomys raviventris*	FE	SE/FP	Found only in saline emergent wetlands of San Francisco Bay and its tributaries.	Potential for occurrence in the tidally-influenced portion of lower Marsh Creek. Closest known occurrence is a 1985 CNDDB record approximately 7 miles northwest of the Project area.	None
San Joaquin kit fox *Vulpes macrotus mutica*	FE	ST	Grasslands and shrubland areas in the San Joaquin Valley with friable soils for building underground dens. Denning begins around September, mating occurs from December to March, and pups are born February through April.	Unlikely to occur. Project area does not contain suitable habitat and is not within the modeled habitat distribution for the species (Jones and Stokes 2006).	Covered
Ringtail *Bassariscus astustus*	-	CFP	Potential permanent resident in riparian or woodland habitats within 0.6 mile from permanent water. Uses a mixture of forest and shrublands or other habitats that provide vertical structure near rocky or riparian areas.	Potential for occurrence in the tidally-influenced portion of lower Marsh Creek where there is established riparian vegetation.	None
American badger *Taxidea taxus*	-	CSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils & open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	Potential for occurrence in the Project area where appropriate habitat is present at proposed recycled water storage tank sites, along portions of proposed pipeline alignment, and in the vicinity of lower Marsh Creek. Closest known occurrence is a 2007 CNDDB record approximately 2 miles east of the Project area.	None

Federal Status
FT = Federal Threatened
FE = Federal Endangered
FC = Federal Candidate
FPT=Federal Proposed Threatened
FPD = Federal Proposed for Delisting
FD = Delisted Species
BCC = USFWS Birds of Conservation Concern

State Status
SR = California Rare
ST = California Threatened
SE = California Endangered
SCT = Candidate for listing as California Threatened
SCE = Candidate for listing as California Endangered
CFP = California Fully Protected
CSC = California Species of Special Concern

Attachment E

Photos of Vegetation Upstream and Downstream of Point of Diversion

Figure 3. Vegetation existing along Marsh Creek immediately upstream from existing outfall (looking downstream towards outfall). Taken June 30, 2014.

Figure 4. Vegetation existing along Marsh Creek immediately downstream from existing outfall (looking upstream towards outfall). Taken June 30, 2014.