Draft Environmental Impact Report

East Bay Municipal Utility District Bayside Groundwater Project

Prepared for
East Bay Municipal Utility District
375 11th Street
Oakland, California 94607

SCH No. 2000092044

March 2005

CH2MHILL
In Association with Orion Consulting
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ES.1 Introduction

This Draft Environmental Impact Report (DEIR) assesses the potential environmental impacts of the Bayside Groundwater Project (Proposed Project or project) proposed by the East Bay Municipal Utility District (EBMUD or the District). This document has been prepared in accordance with the California Environmental Quality Act (CEQA), Public Resources Code, section 21000, *et seq.* and CEQA's implementing guidelines (CEQA Guidelines), Title 14, California Code of Regulations, sections 15000, *et seq*. The District is the lead agency for the CEQA process. Inquiries about the project should be directed to:

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ES.2 Project Overview

ES.2.1 Need for the Project

In October 1993, EBMUD adopted a Water Supply Management Program (WSMP) that serves as a planning guide for the provision of water to the EBMUD service area through the year 2020. The WSMP demonstrated that EBMUD's existing water supplies are insufficient to meet current and future customer demand during droughts, despite implementation of conservation and water recycling programs and an aggressive dry-year water rationing policy. Without additional near-term water supplies, EBMUD customers will experience potentially severe water shortages during prolonged droughts. These conclusions were later confirmed in the District's Urban Water Management Plan (UWMP), which showed that rationing of up to 67 percent may be necessary in the future without additional drought water supplies, resulting in severe regional economic and quality-of-life impacts (EBMUD 2001).

ES.2.2 Project History

In 1997, EBMUD drilled a demonstration well at the Oro Loma Sanitary District Wastewater Treatment Plant at 2600 Grant Avenue in San Lorenzo to investigate the feasibility of using deep aquifers in the South East Bay Plain Basin (SEBPB) to store water for later recovery and use during droughts. More specifically, EBMUD investigated the feasibility of (1) injecting and storing excess potable drinking water collected in wet years into the deep aquifers, and (2) recovering both injected water and native groundwater for use in drought conditions. Studies of the demonstration well's operation verified the feasibility of both of these components.

In March 2001, EBMUD circulated a Draft Environmental Impact Report (2001 DEIR) on the Bayside Groundwater Project (SCH No. 2000092044). The 2001 DEIR evaluated the impacts of developing multiple injection wells in the San Lorenzo area with a collective annual capacity of 15 million gallons per day (mgd). The DEIR analyzed a number of well locations, a treatment facility location, and pipeline alternatives. Based on comments received on the DEIR, the District subsequently conducted focused studies that have led to substantial project changes that eliminate potentially significant impacts or reduce to less than significant levels the impacts that remain.

Rather than revise and recirculate the 2001 DEIR to analyze the modified project, EBMUD has prepared this new Bayside Groundwater Project Draft Environmental Impact Report (SCH No. 2000092044). An overview of the project is set forth in Section ES.2.4 and is fully described in Section 2.0 (Project Description) of this DEIR.

The project, as revised, involves the injection of potable drinking water into the SEBPB during wet years for later recovery and use during a drought. As analyzed in this DEIR, the project is proposed in two phases. Phase 1 would be implemented immediately to provide an annual capacity of 1 mgd. Phase 2 is the potential future expansion of groundwater facilities with an annual capacity of between 2 and 10 mgd.

EBMUD has made no commitment to implement Phase 2. EBMUD intends to use the information gathered from Phase 1 operations to help inform its future determinations on whether and how to proceed with Phase 2. If EBMUD determines to implement Phase 2, EBMUD would at that time complete a subsequent EIR. However, to the extent EBMUD can analyze the potential impacts of Phase 2 at this time, that analysis is included in Section 4.0 of this DEIR.

ES.2.3 Project Objectives

The District's overall objectives for the Bayside Groundwater Project are:

- To reliably provide more water for customer use during drought periods than would be available from current water supplies alone;
- To make beneficial use of local water resources, and
- To provide water that complies with state and federal drinking water standards while maintaining or enhancing basin water quality.

Additional project objectives are:

- To initiate EBMUD groundwater use within the SEBPB to prepare for both near-term (less than five years) and future drought conditions, and
- To collect data to inform decisionmaking regarding (1) whether it is appropriate to implement Phase 2 a larger-capacity facility and, if so, (2) how to design it.

ES.2.4 Project Description

The Bayside Groundwater Project involves the injection of local runoff and water conserved in the Mokelumne River in wet years into the SEBPB for later recovery and use during a drought. Phase 1 of the project would be implemented immediately to provide (a) annual capacity up to 1 mgd, and (b) information to determine whether to proceed with Phase 2, and if so, to guide EBMUD in developing the Phase 2 design and operation features.

This Bayside Groundwater Project DEIR focuses on Phase 1, which is the immediate project EBMUD proposes to build and operate. At this time, EBMUD does not know whether it will pursue Phase 2, or, if it does pursue Phase 2, exactly what facilities would be necessary, where those facilities would be located, or what would be the specific size of those future facilities, which could range from 2 to 10 mgd in average annual capacity. EBMUD plans to use information gained from operation of Phase 1 to help determine whether and how to proceed with Phase 2. Therefore, although this DEIR contains some discussion of potential Phase 2 impacts, in-depth discussion of Phase 2 impacts is deferred until EBMUD proposes what, if any, Phase 2 facilities should be constructed and where. If and when EBMUD proposes Phase 2 facilities in the future, EBMUD will then complete a subsequent EIR. However, to the extent EBMUD can analyze the potential impacts of Phase 2 at this time, that analysis is included in Section 4.0 of this DEIR.

ES.2.5 Project Location

EBMUD has performed extensive studies to determine the viability of groundwater storage and recovery. These studies included hydrogeologic analysis, analysis of water quality and treatment options, demonstration testing of treatment methodologies, construction of test wells, and construction and operation of a full-size injection/extraction demonstration well. The studies have demonstrated that the best site for storage and extraction of groundwater in the local aquifer is in unincorporated San Lorenzo and the City of San Leandro near the San Francisco Bay shore, an area that encompasses the existing demonstration well and test facilities.

The project site is located within the unincorporated area of Alameda County known as San Lorenzo. Figure ES-1 shows the project location and the boundaries of the groundwater basin and adjacent basins. The SEBPB is located within the western portion of Alameda County. It is bounded on the east by the Hayward Fault and extends beneath San Francisco Bay to the west. The SEBPB thins to insignificance to the north near Berkeley, and its southern boundary is in Hayward near the San Mateo Bridge. Figure ES-2 shows the location of project facilities for Phase 1. Figure ES-1 also shows the area in which facilities for Phase 2 may be located. Table ES-1 lists all project facilities proposed for Phase 1, and to the extent that they can be determined at this time, the potential project facilities for Phase 2.

TABLE ES-1
Project Description Summary

Project Feature	Phase 1	Phase 2
Project Capacity	Average 1mgd extraction (short-term extraction up to 2 mgd rate) [a]; 1 mgd injection	2 to 10 mgd
Source of Injection Water	Several sources, including local runoff and conserved Mokelumne River water	Several sources, including local runoff and conserved Mokelumne River water
Number of Wells	One existing	Up to four additional
Well Locations	Adjacent to Oro Loma plant site in San Lorenzo	Industrial zone, westerly end of westerly Grant Avenue, or venues within a broader area including San Lorenzo, San Leandro, and southern part of Oakland
Treatment after Extraction	At-the-wellhead chloramination, pH control, fluoridation; iron and manganese removal as needed	Not currently identified
Treatment Plant Location	Treatment at well site	Well sites or centralized treatment plant; location not known
Pipeline Alignment	Connection to existing 12”-diameter main in Grant Avenue; approximately 500 feet	Unknown but in the vicinity of well locations
Treatment Prior to Discharge	Settling followed by dechlorination	Not currently identified
Discharge	Filter backwash and well backflush via storm drain system and sanitary sewer, respectively	Not currently known
Operational Parameters	Drought Supply – May initiate operation when October reservoir storage is projected to decline below 500,000 AF	Drought Supply – May initiate operation when October reservoir storage is projected to decline below 500,000 AF
Alternatives	- No Project Alternative - Increased Conservation - Increased Reclamation - Regional Desalination - Groundwater Storage in East Contra Costa County	- No Project Alternative - Increased Conservation - Increased Reclamation - Regional Desalination - Groundwater Storage in East Contra Costa County
Monitoring	Ongoing monitoring of ground surface elevation change (subsidence), water quality, groundwater levels, and model verification	Not currently known; anticipated to be similar to Phase 1; possibly expanded version of Phase 1 monitoring

[a]Short-term extraction rate could be up to 2 mgd; however, the annual average extraction would not exceed 1 mgd.

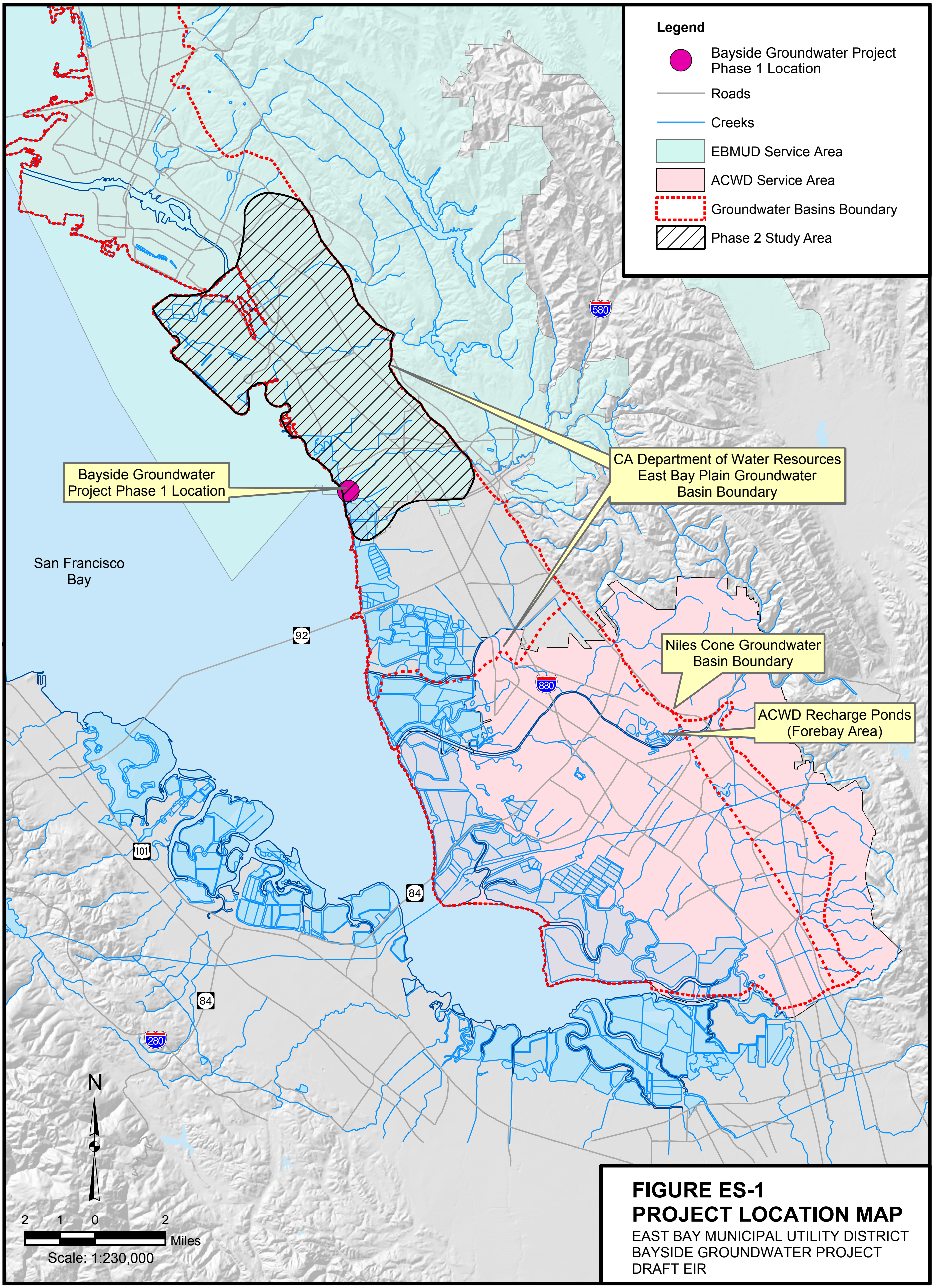

FIGURE ES-1
PROJECT LOCATION MAP
EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

FIGURE ES-2
PHASE 1 FACILITY LOCATIONS
EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

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ES.3 Organization of this DEIR

This DEIR contains each of the elements required by CEQA for an EIR. Section 1, Introduction, describes the background and the need for the project, its relationship to other related projects, the purpose and the use of this DEIR, and the EIR process. Section 2, Project Description, includes detailed information about Phases 1 and 2 of the project, including required facilities, operating parameters, construction methods, subsidence, groundwater and water quality monitoring program, alternatives, the anticipated schedule, and the required approvals for the project. Section 3 describes the existing setting, potential impacts, and mitigation measures for Phase 1. Section 4 presents a similar analysis for Phase 2 to the extent information is available.

The potentially affected resource areas analyzed in Sections 3 and 4 were based on the Initial Study Checklist prepared for the Notice of Preparation for this DEIR (see Appendix A). On the basis of the Checklist, EBMUD determined that implementation of Phase 1 would not have an impact on the following resource areas: Aesthetics, Agricultural Resources, Land Use, Mineral Resources, Population and Housing, Public Services, and Recreation. Although EBMUD has not committed to implementing Phase 2, and as such specific locations and facilities have not been identified, it is assumed that the same resource areas would not be affected, with the exception of Land Use and Visual Resources/Aesthetics, which could be affected, depending on the location of facilities.

Growth-inducing impacts are addressed in Section 5, cumulative impacts are addressed in Section 6, and the alternatives analysis for the project is in Section 7.

ES.4 Summary of Significant Impacts and Mitigation Measures

This DEIR concludes that Phase 1 of the project, as mitigated, would have no significant impact. Specifically, this DEIR concludes that, for the following resource areas, implementation of Phase 1 would have no impact, a less than significant impact with no mitigation required, or a less than significant impact with the implementation of effective and feasible mitigation measures:

(a) groundwater hydrology and quality;
(b) water, quality, treatment and distribution;
(c) surface water hydrology and quality;
(d) biological resources;
(e) geology, soils, and seismicity;
(f) air quality;
(g) hazards;
(h) traffic and transportation;
(i) noise;
(j) utilities;
(k) cultural resources;
(l) growth inducing impacts; and
(m) cumulative impacts.

This DEIR concludes that some of the effects of Phase 2 are presently knowable, and some are presently unknowable. For the presently knowable effects of Phase 2, this DEIR concludes that development of Phase 2 facilities would also have no impact, a less than significant impact with no mitigation required, or a less than significant impact with the implementation of effective and feasible mitigation measures. If and when EBMUD determines to implement Phase 2, a subsequent EIR will be prepared.

Table ES-2A presented at the end of this chapter summarizes the environmental effects of Phase 1 of the project after mitigation, and Table ES-2B summarizes the environmental effects of Phase 2 of the project after mitigation.

Sections 3 and 4 (Environmental Setting, Impacts, and Mitigation Measures), Section 5 (Growth-Inducement Potential), and Section 6 (Cumulative Impacts) each provide a description of the criteria used in making the above significance determinations.

ES.5 Project Alternatives

CEQA Guidelines Section 15126.6 requires that an EIR evaluate a range of reasonable alternatives to a project, or to the location of a project, which would feasibly attain most of the basic project objectives and avoid or lessen significant project impacts. Chapter 7 of this DEIR describes the extensive alternatives analysis conducted for the Bayside Groundwater Project. That analysis resulted in the identification of three project alternatives that could potentially meet the Bayside Groundwater Project objectives:

- Increased Conservation and Recycling
- Bay Area Regional Desalination
- East Contra Costa County Groundwater Project

The alternatives analysis included in Section 7 of this DEIR compares the impacts of these three alternatives with the Proposed Project and the No Project Alternative. The analysis concluded the following:

ES.5.1 Alternative 1 – No Project Alternative

The No Project Alternative would not meet the need for the project, nor would it satisfy the primary project objectives, as described in Section 7.3. As described in Table 7-4, the No Project Alternative would result in fewer overall environmental impacts than the project in most resource area categories. An exception is Public Services and Utilities, where severe water rationing would impact the ability of service providers and utilities to meet customer demand.

ES.5.2 Alternative 2 – Increased Conservation and Recycling

Under Alternative 2, conservation and recycling activities would provide a local water supply during drought periods but would not satisfy the additional project objective being completed in the near term, as described in Section 7.3. The impacts of Alternative 2 are generally dependent on the site selection for recycling facilities but would likely result in impacts similar to those of the project, with the exception of impacts for Groundwater

Hydrology and Quality, Surface Water Hydrology and Quality, and Hazards, for which overall impacts would likely be less than under the project.

ES.5.3 Alternative 3 – Bay Area Regional Desalination

Desalination meets the objectives for developing a supplemental water supply and a local water resource, and meets water quality objectives; however, this alternative is not implementable in the near term. Biological Resources and Surface Water Hydrology and Quality impacts resulting from Alternative 3 are unknown and could be greater or less than those of the Proposed Project, depending on whether an acceptable brine solution disposal option is developed in conjunction with the Regional Water Quality Control Board (RWQCB). In addition, as described in Section 7.3, desalination would require a substantial amount of energy. It is anticipated that this energy requirement would be greater than that of the project.

ES.5.4 Alternative 4 - East Contra Costa Groundwater Development

East Contra Costa Groundwater Development would meet the need for a supplemental water supply, would develop a local resource, and would meet water quality objectives, but it is unlikely to be accomplished in the near term because of the institutional complexity of its implementation. Agreements with local partners and groundwater users are also needed to further develop this alternative. To date, attempts to create such agreements have been unsuccessful. Implementation of Alternative 4 would likely result in similar impacts as those of the project, except for Traffic and Transportation and Land Use impacts, which may be greater than for the project.

ES.5.5 Environmentally Superior Alternative

CEQA Guidelines 15126.6(e)2, Consideration and Discussion of Alternatives to the project, states, "If the environmentally superior alternative is the No Project Alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives." For this project, Alternative 1, the No Project Alternative, is environmentally superior to the others for the reasons stated in Section 7.3; therefore, the next environmentally superior alternative is discussed below.

Conservation and Recycling would likely have less environmental impact than the project and the other alternatives. Alternative 2 is, therefore, the environmentally superior alternative. However, Alternative 2 does not meet one of the project objectives: near-term implementation. EBMUD is therefore proceeding with Phase 1 of the project.

ES.6 Project Schedule

The following schedule milestones are effective at the time this DEIR is released for public comment. Dates following the release of the DEIR for public comment are subject to change.

- Opening of 45-day public comment period for DEIR, March 2005
- Closing of public comment period, April 2005
- Certification of EIR and approval of Phase 1 by District Board of Directors, August 2005
- Completion of final design, March 2006

- Award of construction contract, October 2006
- Completion of construction, October 2007
- Duration of startup operation, September 2007 to September 2008
- Project in service, October 2008

ES.7 Topics of Controversy

Numerous comments were received from members of the public and potentially affected agencies on the 2001 project DEIR. The comments received primarily expressed concerns regarding potential subsidence, air quality, water quality, and groundwater supply and movement. EBMUD has responded to these comments by significantly revising the project. Some of the concerns expressed about the original project have been eliminated by changing it to a smaller, two-phased project. This DEIR would permit development of Phase 1 only. A subsequent EIR will be required if and when EBMUD decides to proceed with Phase 2. Phase 1, with the mitigation measures recommended in this DEIR, reduces all potential impacts to less than significant levels. The comments received on the 2001 EIR are summarized in Table B-1 in Appendix B. Table B-1 also describes how and where the comments on the 2001 DEIR are addressed in this DEIR.

ES.8 References – Executive Summary

EBMUD. 2001. *Urban Water Management Plan 2000*. Water Resources Projects Division. February.

TABLE ES-2A
Summary of Potentially Significant Impacts and Mitigation Measures for Phase 1

Environmental Resource	Potential Impact	Mitigation	Level of Significance
3.1 Groundwater Hydrology and Quality	**Phase 1 Potential Impact 3.1-1.** Adverse change in native groundwater quality	None required.	Less than significant
	Phase 1 Potential Impact 3.1-2. Change in groundwater levels affecting ACWD operations in the NCGWB	None required.	Less than significant
	Phase 1 Potential Impact 3.1-3. Changes in groundwater level affecting users of the SEBPB	**Mitigation Measure 3.1-3a**. EBMUD will inventory existing wells within the areas of the SEBPB where groundwater modeling indicates that drawdown effects could be observed in response to Phase 1 extractions and water levels could rise above the ground surface in response to injections, including existing use, screened intervals, total depth, and depth of pump. This information will be compared to predicted drawdown and drawup at each well location, and key wells that could be affected by operation of Phase 1 of the project will be identified. **Mitigation Measure 3.1-3b.** EBMUD will regularly monitor water levels in key deep zone wells that could experience flowing conditions or be rendered inoperable in accordance with the water level monitoring program. For wells operating at the time the Bayside EIR is certified that are rendered inoperable because of predicted drawdown effects, EBMUD will provide modifications such as deepening of the well or pump to ensure that well operation is retained. Alternatively, an affected well owner within EBMUD's service area could be connected to the EBMUD system if the well cannot be appropriately modified. **Mitigation Measure 3.1-3c.** For abandoned or inactive wells located in areas where predicted water levels could be raised above the ground surface in response to injection, EBMUD will work with the property owners to properly destroy the wells in accordance with state standards. **Mitigation Measure 3.1-3d.** For active wells located in areas where water levels are anticipated to rise above ground surface during injection, prior to initiating injection EBMUD will retrofit wells that could be pressurized. EBMUD will regularly monitor water levels and conduct surface surveys for "flowing wells." Should monitoring and field observations indicate that a well is flowing due to injection during Phase 1, injection of water will be immediately decreased or stopped. EBMUD will enter into discussions with affected well owners to assess whether the wellheads could be modified to allow for pressurization. Injection rates will not	Less than significant after mitigation

TABLE ES-2A
Summary of Potentially Significant Impacts and Mitigation Measures for Phase 1

Environmental Resource	Potential Impact	Mitigation	Level of Significance
		be increased to levels that will produce well overflow again until such modifications are made to the affected wells, or until overflow conditions have stopped.	
	Phase 1 Potential Impact 3.1-4. Changes in groundwater levels affecting operations of the City of Hayward emergency supply wells	**Mitigation Measure 3.1-4a**. EBMUD will provide up to $50,000 of funding to the City of Hayward for the City to add additional emergency capacity to the City's well system or for the City to make other system improvements to mitigate impacts to that system resulting from Phase 1 of the project. EBMUD will also provide surplus water to Hayward through existing or planned emergency interties consistent with existing emergency intertie agreements.	Less than significant after mitigation
		Mitigation Measure 3.1-4b. If water level rises in response to injection into the Deep Aquifer render the Hayward emergency supply wells inoperable due to pressurized conditions, EBMUD will retrofit the wellheads to allow for pressurization.	
	Phase 1 Potential Impact 3.1-5. Saltwater intrusion in the SEBPB and NCGWB and/or movement of pre-existing plumes of brackish water in the NCGWB	None required.	Less than significant
	Phase 1 Potential Impact 3.1-6. Permanent land subsidence resulting from exceeding historic low water levels	**Mitigation Measure 3.1-6.** Monitoring for subsidence will be conducted on a real-time continuous basis throughout operation of the project. Phase 1 of the project will be implemented incrementally initially to allow observations of the response of the groundwater system and surrounding soils to project operations. This slow startup and ongoing monitoring will provide the ability for EBMUD to respond quickly should monitoring indicate that permanent subsidence is occurring at a level that could adversely affect overlying land uses. The accuracy of well-constructed extensometers is on the order of micrometers (0.001 millimeters). After project startup, extensometers will be monitored on a daily or more frequent basis, and data continuously reviewed to assess whether subsidence is occurring and whether it is elastic or inelastic. If any inelastic subsidence is detected the accuracy of the extensometers is such that it will be a very small amount measurable near the Bayside Well No. 1, and EBMUD will implement corrective action, such as reducing pumping rates or ceasing extractions.	Less than significant after mitigation

3.2 Water Quality, Treatment, and Distribution	**Phase 1 Potential Impact 3.2-1**. Potential drawing of contamination into the water supply through pumping	**Mitigation Measure 3.2-1a.** Using information generated under Mitigation Measures 3.1-3a, b and c, work with parties responsible for contamination and owners of deep wells within 200 feet of known contaminant plumes to destroy those wells or retrofit them if they remain active. **Mitigation Measure 3.2-1b.** As part of the Bayside Groundwater Project monitoring program, annually collect and test water quality samples from multiple monitoring wells screened in specific aquifers for contaminants known to exist in the SEBPB aquifer. This will provide an early warning system in the event contaminants move into the Deep Aquifer. **Mitigation Measure 3.2-1c.** Monitor water quality in the Phase 1 production well and implement a wellhead protection program as required by the Department of Health Services.	Less than significant after mitigation
3.3 Surface Water Hydrology and Quality	**Phase 1 Potential Impact 3.3-1**. Potential stormwater-related erosion, sedimentation, and transport of fuels, oils, or grease to surface waters	**Mitigation Measure 3.3-1.** Implement Best Management Practices (BMPs) designed to reduce contact between exposed soil and rainfall, minimize erosion of exposed soil, and minimize the contact of construction materials, equipment, and maintenance supplies (e.g., fuels, lubricants, paints, solvents, and adhesives) with stormwater. BMPs may include, but are not limited to, the use of silt fencing, straw wattles, and silt and sediment traps. Additional protective actions may include, but are not limited to, adjusting the Phase 1 layout and controlling access during construction. The area will be monitored after storm events to determine whether BMPs need to be adjusted to reduce erosion. If necessary, adjustments to BMPs will be implemented.	Less than significant after mitigation
	Phase 1 Potential Impact 3.3-2. Discharge of sediments and other pollutants to surface water from dewatering of excavations	**Mitigation Measures 3.3-2.** Implement Mitigation Measures 3.7-1b (compliance with the District's Trench Spoils Field Management Practice Program), 3.7-1c (preparation of a disposal plan specifying the disposal method for soil), and 3.7-1d (preparation of a detailed discharged water control and disposal plan), as specified below in Section 3.7, Hazards.	Less than significant after mitigation
3.4 Biological Resources	**Phase 1 Potential Impact 3.4-1**. Transport of sediment into sensitive areas during construction	**Mitigation Measure 3.4-1.** Implement standard BMPs for erosion control during construction of the treatment facility. BMPs may include, but are not limited to, the use of silt fencing, straw wattles, and silt and sediment traps. If necessary, adjustments to BMPs will be implemented.	Less than significant after mitigation

	Phase 1 Potential Impact 3.4-2. Accumulation of debris that subsidizes predatory animals	**Mitigation Measure 3.4-2**. EBMUD and its contractor will: (1) dispose of trash routinely and place stored items in bins, containers or other secured facilities to prevent their use as shelter by mammalian predators; (2) maintain locked trash barrels for discarded food items and containers and promptly remove litter, especially food wrappers, bottles, and containers; (3) remove planks and passages over water, and other means of temporary access nightly to prevent mammalian predation of ground nesting birds; and (4) remove all tools, surplus materials, scrap material, debris, and waste from the job site upon completion of construction.	Less than significant after mitigation
3.5 Geology, Soils, and Seismicity	**Phase 1 Potential Impact 3.5-1**: Earthquake damage to Phase 1 facilities	**Mitigation Measure 3.5-1a.** Identify the appropriate UBC design criteria for the Phase 1 facilities on the basis of the subsurface conditions at the site and ensure that the UBC design criteria are incorporated into the final design of the project. **Mitigation Measure 3.5-1b:** Update the EBMUD earthquake preparedness and emergency response program to include Phase 1 facilities.	Less than significant after mitigation
3.6 Air Quality	**Phase 1 Potential Impact 3.6-1**. Particulate and exhaust emissions generated from construction of Phase 1 facilities	**Mitigation Measure 3.6-1.** Construction activities must comply with the Basic Control Measures for dust emissions, as outlined in the BAAQMD *CEQA Guidelines*. These include: (1) water all active construction areas at least twice daily; (2) cover all trucks hauling soil, sand, and other loose debris *or* require all truckloads to maintain at least 2 feet of freeboard; (3) pave, apply water three times daily, or apply nontoxic soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites; (4) sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at construction sites, and (5) sweep streets daily (with water sweepers), if visible soil material is carried onto adjacent public streets.	Less than significant after mitigation
3.7 Hazards	**Phase 1 Potential Impact 3.7-1**. Possible exposure of construction workers and the public to pre-existing hazardous materials in the soil and groundwater during excavation and dewatering	**Mitigation Measure 3.7-1a.** Retain a qualified professional (e.g., a California Registered Environmental Assessor) to conduct a Phase I environmental site assessment of the Phase 1 area for conformance with standards adopted by the ASTM for Phase I Environmental Site Assessments. If the Phase I Environmental Site Assessment indicates that a release of hazardous materials could have affected soil or groundwater quality at the site, retain a qualified environmental professional to conduct a Phase II Environmental Site Assessment to assess the presence and extent of contamination at the site, in conformance with state and local guidelines and regulations. If the results of the subsurface investigation(s) indicate the presence of hazardous materials, alteration of facility design or site remediation may be required by the applicable state or local regulatory agencies. Final design of proposed facilities will comply with all regulatory requirements for facility design and site remediation. **Mitigation Measure 3.7-1b.** Comply with the requirements of the Trench Spoils Field Management Practices Program for all trenching activities. The	Less than significant after mitigation

	requirements include an environmental assessment, a sampling program to evaluate the potential for hazardous materials to be encountered in soil and groundwater during construction, and evaluation of soil and groundwater analytical data to identify appropriate health and safety precautions as well as disposal requirements for soil and groundwater produced during trenching. The environmental assessment will be completed within three months of the time of construction to accurately estimate the conditions that could be expected during construction. **Mitigation Measure 3.7-1c.** In compliance with the District Trench Spoils Program, prepare a plan specifying the disposal method for soil, the approved disposal site, and written documentation that the disposal site will accept the waste. Prepare and implement a site safety plan detailing measures to be taken to alleviate identified risks. The health and safety plan will identify the chemicals present, potential health and hazards, monitoring to be performed during site activities, soils-handling methods required to minimize the potential for exposure to harmful levels of the chemicals identified in the soil, appropriate personnel protective equipment, and emergency response procedures. **Mitigation Measure 3.7-1d.** Prepare a detailed discharged water control and disposal plan detailing requirements for containment and discharge of rainwater and groundwater produced from excavations and use of wash water. The discharge plan shall include requirements for testing and disposal of such liquid. Comply with regulations of the RWQCB, CDFG, ACFCD, and other regulatory agencies having jurisdiction. **Mitigation Measure 3.7-1e.** Develop a contingency plan for sampling and analysis of potential hazardous materials and for coordination with the appropriate regulatory agencies in the event that previously unidentified hazardous materials are encountered during construction. If hazardous materials are identified, modify the health and safety plan to include the new data, conduct sampling to assess the chemicals present, and identify appropriate disposal methods. Perform site investigations or remedial activities in accordance with applicable laws. Typically, the ACEHS would be the responsible agency in San Lorenzo. The RWQCB or DTSC or both could be involved if groundwater or surface water or soil is contaminated.	
Phase 1 Potential Impact 3.7-2. Accidental release of water treatment chemicals during transport, handling, or storage	**Mitigation Measure 3.7-2a.** Construct chemical storage areas in accordance with the UFC. The UFC requires that chemical storage areas be constructed with secondary containment adequate to retain a release of the contents of the largest single tank or container plus a volume based on the design flow rate of the automatic fire-extinguishing system for the area. It also requires that incompatible chemicals (such as acids and bases) be physically separated. **Mitigation Measure 3.7-2b.** Prepare an HMBP for the Phase 1 facilities. The plan will discuss handling and storage, including containment, site layouts, and	Less than significant after mitigation

		emergency response and notification procedures for a spill or release from the tanks, and will include site-specific emergency response procedures prepared in accordance with the District's program plan.	
3.8 Traffic and Transportation	None	None required	No impact
3.9 Noise	**Phase 1 Potential Impact 3.9-1**. Construction of Phase 1 facilities resulting in temporary noise increases at nearby noise-sensitive residential receptors	None required	Less than significant
	Phase 1 Potential Impact 3.9-2. Potential disturbance of nesting birds by construction of Phase 1 facilities	**Mitigation Measure 3.9-2.** If construction work is to be conducted between mid-January and the end of June, conduct pre-construction nesting surveys to determine if species protected by the Migratory Bird Treaty Act are nesting in the vicinity of the work areas. If work is to occur during the clapper rail nesting or breeding period (approximately mid-January to mid-April), and if pre-construction surveys result in discovery of nesting activity, work shall be restricted to activities that do not have the potential to disturb breeding or nesting and that avoid generating percussive noise.	Less than significant after mitigation
3.10 Utilities	None	None required	No impact
3.11 Cultural Resources	**Phase 1 Potential Impact 3.11-1.** Unanticipated discovery of subsurface archaeological deposits	**Mitigation Measure 3.11-1.** Require through project specifications that if cultural resources such as chipped or ground stone, historic debris, building foundations, or human bone are inadvertently discovered during construction activities, the construction contractor should adhere to the following procedure: (1) Stop work immediately in that area within 100 feet of the discovery. (2) Retain a qualified archaeologist to assess the significance of the find and develop appropriate actions for preservation or relocation of the artifacts in consultation with such experts as the State Historic Preservation Office and Native American tribal interests if appropriate. (3) If human bone is discovered, the contractor will notify the county coroner in compliance with state law, and the EBMUD Office of Regulatory Compliance.	Less than significant after mitigation

TABLE ES-2B
Summary of Potentially Significant Impacts and Mitigation Measures for Phase 2

Environmental Resource	Potential Impact	Mitigation	Level of Significance
4.1 Groundwater Hydrology and Quality	**Phase 2 Potential Impact 4.1-1:** Adverse effect on native groundwater quality	Phase 2 would be required to comply with the Underground Injection Program and associated permit administered by the EPA. This program provides safeguards so that injection wells do not endanger current and future underground sources of drinking water. Prior to issuing the necessary permit, the EPA would review the proposed Phase 2 facilities to ensure that the injected fluids are contained within the target aquifer system and in conformance with federal drinking water standards. Potentially significant until the degree of impact and feasibility of mitigation are determined in a subsequent EIR for Phase 2.	Potentially significant Analysis in subsequent EIR required
	Phase 2 Potential Impact 4.1-2. Change in groundwater levels affecting ACWD operations in the NCGWB	If EBMUD decides to proceed with Phase 2, it would adopt design criteria and, if necessary, mitigation measures to ensure that groundwater is maintained in the Newark Aquifer of the NCGWB within a scientifically reasonable range, consistent with the approach used to evaluate Phase 1 impacts. The Phase 2 criteria and mitigation measures could include providing potable water to the ACWD distribution system or make-up or recharge water to the ACWD recharge facilities, changing pumping strategies, operating at a lower pumping rate, or stopping operations. Specific changes to NCGWB groundwater levels during Phase 2 implementation cannot be identified at this time. Based on presently available information, impacts related to NCGWB groundwater levels, if any, could be reduced to a less than significant level through Phase 2 design and operation requirements and mitigation measures, as discussed above. Until those design and operation requirements and mitigation measures are defined in a subsequent EIR for Phase 2, this impact is considered potentially significant.	Potentially significant Analysis in subsequent EIR required
	Phase 2 Potential Impact 4.1-3. Changes in groundwater level affecting other users of the SEBPB	In connection with Phase 2 implementation, EBMUD would inventory existing wells that could be affected; implement a well-monitoring program; and implement, as necessary, mitigation measures to reduce the effects of water level changes in the SEBPB. Specific changes to SEBPB groundwater levels during Phase 2 implementation cannot be identified at this time. Based on presently available information, impacts related to SEBPB groundwater levels, if any, could be reduced to a less than significant level through Phase 2 design and operation requirements and the implementation of mitigation measures, as discussed above. Until those design and operation requirements and mitigation measures are defined in a subsequent	Potentially significant Analysis in subsequent EIR required

TABLE ES-2B
Summary of Potentially Significant Impacts and Mitigation Measures for Phase 2

Environmental Resource	Potential Impact	Mitigation	Level of Significance
		EIR for Phase 2, this impact is considered potentially significant.	
	Phase 2 Potential Impact 4.1-4. Changes in groundwater level affecting operations of the City of Hayward emergency supply wells	EBMUD would conduct groundwater modeling to predict the effects of the Phase 2 groundwater pumping and injection and use this information to site production wells and design pumping and injection strategies to maintain water levels within an acceptable range. Should water level changes under any scenario be beyond the acceptable limits, EBMUD would implement appropriate measures, including providing additional water to the City of Hayward, retrofitting their wells, or installing a new well to maintain the capacity of the existing well field as specified below. In addition, EBMUD would retrofit the existing Hayward emergency supply wells should injection of water during Phase 2 cause pressurization that interferes with ongoing operation of the wells. Specific effects on the Hayward Emergency Supply wells during Phase 2 implementation cannot be identified at this time. Based on presently available information, any Phase 2 impacts on the Hayward Emergency Supply wells could be reduced to a less than significant level through design and operation requirements and the implementation of mitigation measures, as discussed above. Until those design and operation requirements and mitigation measures are defined in a subsequent EIR for Phase 2, this impact is considered potentially significant.	Potentially significant Analysis in subsequent EIR required
	Phase 2 Potential Impact 4.1-5. Saltwater intrusion in the SEBPB and NCGWB and/or movement of pre-existing plumes of brackish water in the NCGWB	EBMUD would monitor water level and water quality responses in the SEBPB and NCGWB during actual Phase 2 operations; use the regional model to interpret the effects of Phase 2 operations on the SEBPB and NCGWB; verify the regional model using observed groundwater data; and implement mitigation measures to maintain NCGWB groundwater levels within acceptable limits, as described under Phase 2 Impact 4.1-2. EBMUD would implement mitigation measures such as altering pumping operations, decreasing pumping rates, expanding facilities to control saltwater intrusion, or providing recharge of water to the Newark Aquifer. The evaluation would consider the cumulative migration of the salt water plumes under both extraction and injection scenarios. Whether saltwater intrusion would occur in the SEBPB and NCGWB during Phase 2 implementation cannot be identified at this time. Based on currently available information, the potential impacts of saltwater intrusion could be reduced to a less than significant level through design and operation requirements and the implementation of mitigation measures, as discussed above. Until those design and operation requirements and mitigation measures are defined in a subsequent	Potentially significant Analysis in subsequent EIR required

TABLE ES-2B
Summary of Potentially Significant Impacts and Mitigation Measures for Phase 2

Environmental Resource	Potential Impact	Mitigation	Level of Significance
		EIR for Phase 2, this impact is considered potentially significant.	
	Phase 2 Potential Impact 4.1-6. Land subsidence resulting from exceedence of historic low water levels during Phase 2	If necessary, shifting pumping between wells, pumping at reduced capacity if inelastic subsidence approached unacceptable limits, or stopping pumping altogether, could reduce any land subsidence impacts to a less than significant level. Whether land subsidence from exceedence of historic low water levels will occur during Phase 2 implementation cannot be identified at this time. Based on currently available information, the potential impacts could be reduced to a less than significant level through design and operation requirements and the implementation of mitigation measures, as discussed above. Until those design and operation requirements and mitigation measures are defined in a subsequent EIR for Phase 2, this impact is considered potentially significant.	Potentially significant Analysis in subsequent EIR required
4.2 Water Quality, Treatment, and Distribution	**Phase 2 Potential Impact 4.2-1.** Potential drawing of contamination into the water supply through pumping	Whether operation of Phase 2 could result in contamination of the deep aquifer from existing contaminant plumes in the shallow *Newark Aquifer equivalent* zone cannot be determined at this time. Based on currently available information, the potential impacts, if any, could be reduced to a less than significant level through design and operation requirements and the continuation of implementation of Mitigation Measures 3.2-1a, b and c. Specific impacts and mitigations cannot be determined until the District determines whether or not to proceed with Phase 2 and, if so, determines Phase 2 locations. The impact is considered potentially significant until facility locations and feasibility of mitigation are determined in a subsequent EIR for Phase 2.	Potentially significant Analysis in subsequent EIR required
	Phase 2 Potential Impact 4.2-2. Pressure effects could reduce level of service in the water system	Specific impacts and mitigations cannot be determined until the District determines whether or not to proceed with Phase 2 and, if so, determines Phase 2 facility locations. The impact is considered potentially significant until facility locations and feasibility of mitigation are determined in a subsequent EIR for Phase 2.	Potentially significant Analysis in subsequent EIR required
4.3 Surface Water Hydrology and Quality	**Phase 2 Potential Impact 4.3-1**. Construction-related stormwater erosion, sedimentation, and transport of fuels, oils, or grease to surface waters	**Mitigation Measure 4.3-1.** Implement BMPs designed to reduce contact between exposed soil and rainfall; minimize erosion of exposed soil; and minimize the contact of construction materials, equipment, and maintenance supplies (e.g., fuels, lubricants, paints, solvents, and adhesives) with stormwater. If the area of disturbance is greater than one acre, Phase 2 activities will need to comply with the Construction General Permit, including implementation of a construction Stormwater Pollution Prevention Plan (SWPPP) that covers all areas to be disturbed by construction activities.	Less than significant after mitigation

TABLE ES-2B
Summary of Potentially Significant Impacts and Mitigation Measures for Phase 2

Environmental Resource	Potential Impact	Mitigation	Level of Significance
	Phase 2 Potential Impact 4.3-2. Discharge of sediments and other pollutants to surface water from dewatering of excavations	**Mitigation Measures 4.3-2**. Implement Mitigation Measures 3.7-1b (compliance with the District's Trench Spoils Field Management Practice Program), 3.7-1c (preparation of a disposal plan specifying the disposal method for soil), and 3.7-1d (preparation of a detailed discharged water control and disposal plan), as specified in Section 3.7, Hazards.	Less than significant after mitigation
	Phase 2 Potential Impact 4.3-3. Adverse affect on water quality from discharges to the San Francisco Bay	**Mitigation Measure 4.3-3.** Comply with conditions in the existing ACFCWCD NPDES permit for stormwater discharges to San Francisco Bay.	Less than significant after mitigation
	Phase 2 Potential Impact 4.3-4. Increased stormwater runoff from new impervious surfaces	**Mitigation Measure 4.3-4.** Develop and implement stormwater control measures consistent with the requirements of the Alameda Countywide NPDES Municipal Stormwater Permit, and the *Draft Stormwater Management Plan* for the control of stormwater runoff. Stormwater control provisions will be included in the site design to reduce the flow, volume, and pollutant load in site runoff to the maximum extent practicable in accordance with the requirements of the permit. The District will coordinate with Alameda County in the development and implementation of appropriate stormwater control measures.	Less than significant after mitigation
4.4 Biological Resources	**Phase 2 Potential Impact 4.4-1**. Transport of sediment into sensitive areas	Potentially significant until facility locations and feasibility of mitigation are determined in a subsequent EIR for Phase 2.	Potentially significant Analysis in subsequent EIR required
	Phase 2 Potential Impact 4.4-2. Increased turbidity, changed water temperature, reduced levels of salinity, or introduced chlorine from discharge of water into surface waters	Potentially significant until facility locations and feasibility of mitigation would be determined in a subsequent EIR for Phase 2.	Potentially significant Analysis in subsequent EIR required
	Phase-2 Impact 4.4-3. Accumulation of debris that subsidizes predatory animals to the detriment of	Potentially significant until facility locations and feasibility of mitigation are determined in a subsequent EIR for Phase 2.	Potentially significant Analysis in subsequent

TABLE ES-2B
Summary of Potentially Significant Impacts and Mitigation Measures for Phase 2

Environmental Resource	Potential Impact	Mitigation	Level of Significance
	natural habitats near the project area		EIR required
4.5 Geology, Soils, and Seismicity	**Phase 2 Potential Impact 4.5-1**: Earthquake damage to Phase 2 facilities	**Mitigation Measure 4.5-1a:** Identify the appropriate UBC design criteria for the proposed facilities on the basis of the subsurface conditions at the site and ensure that the UBC design criteria are incorporated into the final design of the project. **Mitigation Measure 4.5-1b:** Update the EBMUD earthquake preparedness and emergency response program to include Phase 2 facilities. Potentially significant until feasibility/effectiveness of mitigation is determined in a subsequent EIR for Phase 2	Potentially significant Analysis in subsequent EIR required
4.6 Air Quality	**Phase 2 Potential Impact 4.6-1**. Particulate and exhaust emissions generated from construction of proposed facilities	**Mitigation Measure 4.6-1.** Construction activities must comply with applicable control measures for dust emissions, as outlined in the BAAQMD *CEQA Guidelines*. These include: Basic Control Measures (apply to all construction sites): (1) Water all active construction areas at least twice daily. (2) Cover all trucks hauling soil, sand, and other loose debris *or* require all truckloads to maintain at least 2 feet of freeboard. (3) Pave, apply water three times daily, or apply nontoxic soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites. (4) Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at construction sites. (5) Sweep streets daily (with water sweepers), if visible soil material is carried onto adjacent public streets. Enhanced Control Measures (apply to sites larger than 4 acres): (1) All Basic Control Measures listed above. (2) Hydroseed or apply (nontoxic) soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more). (3) Enclose, cover, water twice daily or apply (nontoxic) soil binders to exposed stockpiles (dirt, sand, etc.). (4) Limit traffic speeds on unpaved roads to 15 mph. (5) Install sandbags or other erosion control measures to prevent silt runoff to public roadways. (6) Replant vegetation in disturbed areas as quickly as possible. Optional Control Measure (apply to larger sites near sensitive receptors or for any other reason where additional emissions reductions are warranted): (1) Install wheel washers for all exiting trucks, or wash off the tires or tracks of all trucks and equipment leaving the site. (2) Install wind breaks, or plant trees/vegetative wind	Potentially significant Analysis in subsequent EIR required

TABLE ES-2B
Summary of Potentially Significant Impacts and Mitigation Measures for Phase 2

Environmental Resource	Potential Impact	Mitigation	Level of Significance
		breaks at windward side(s) of construction areas. (3) Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph. (4) Limit the area subject to excavation, grading, and other construction activity at any one time. Potentially significant until the feasibility and effectiveness of mitigation is determined in subsequent environmental documentation for Phase 2.	
4.7 Hazards	**Phase 2 Potential Impact 4.7-1**. Exposure of construction workers and the public to pre-existing hazardous materials in the soil and groundwater during excavation and dewatering	Exposure to hazardous materials during construction of Phase 2 could be mitigated through a strategy similar to that specified for Phase 1: a Phase I Environmental Site Assessment for the well location and associated treatment facilities (with follow-up requirements for a Phase II Environmental Site Assessment and remediation, if required); compliance with the District's Trench Spoils Field Management Practice program for trenching activities; preparation of a materials disposal plan, including a health and safety plan; preparation of a discharge water control and disposal plan; and preparation of a contingency plan with procedures to be followed in the event that previously unidentified contamination is identified.	Less than significant after mitigation
	Phase 2 Potential Impact 4.7-2. Accidental release of water treatment chemicals	Potentially significant until feasibility/effectiveness of mitigation is determined in a subsequent EIR for Phase 2.	Potentially significant Analysis in subsequent EIR required
4.8 Traffic and Transportation	**Phase 2 Potential Impact 4.8-1**. Traffic delays during construction resulting from reduced number or width of travel lanes on roads	As part of a subsequent EIR for Phase 2, a detailed traffic study would identify location-specific impacts to the transportation system from construction and operation of Phase 2 project facilities, and outline additional mitigation measures to reduce those location specific affects to insignificance. This impact remains potentially significant until feasibility and effectiveness of mitigation is determined in a subsequent EIR for Phase 2.	Potentially significant Analysis in subsequent EIR required
	Phase 2 Potential Impact 4.8-2. Temporarily impeded access to adjacent land uses and streets	Potential mitigations would include notification to police, fire, and other emergency service providers of the timing, location, and duration of construction activities and the location of detours and lane closures. EBMUD would also consult with local agencies and community members to minimize disruption of auto traffic, bus service and pedestrian access to any sensitive land uses, such as schools, hospitals, and retirement homes, located along a proposed pipeline route. Potentially significant until feasibility/effectiveness of mitigation is determined in a subsequent EIR for Phase 2.	Potentially significant Analysis in subsequent EIR required

TABLE ES-2B
Summary of Potentially Significant Impacts and Mitigation Measures for Phase 2

Environmental Resource	Potential Impact	Mitigation	Level of Significance
4.9 Noise	**Phase 2 Potential Impact 4.9-1**. Temporary noise increases at nearby noise-sensitive receptors from construction activities	**Mitigation Measure 4.9-1**. Potential mitigation could include the following measures to minimize construction noise impacts: • Locate construction staging areas away from any nearby sensitive receptors to the extent feasible. • In noise-sensitive work areas, fit equipment with best practically available noise control technology (including mufflers, intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds). • Use hydraulically or electrically powered impact equipment (e.g., jack hammers, pavement breakers, and rock drills) for project construction wherever possible to avoid the noise associated with compressed-air exhaust from pneumatically powered tools. Fit pneumatically powered tools with a muffler on the compressed-air exhaust unit. Use external jackets on the tools where feasible. • Designate a specific EBMUD point of contact with authority to investigate and resolve construction-related noise complaints. • If any project facilities are located near sensitive biological habitat, avoid high noise impact construction activities during critical periods such as the breeding season of sensitive species. Potentially significant until feasibility/effectiveness of mitigation is determined in a subsequent EIR for Phase 2.	Potentially significant Analysis in subsequent EIR required
	Phase 2 Potential Impact 4.9-2. Increase in ambient noise from operation of proposed facilities	**Mitigation Measure 4.9-2.** As part of a subsequent EIR for Phase 2, a detailed noise study will be conducted to identify potential noise-sensitive receptors, estimate potential increases in ambient noise levels from operation of project facilities, and outline mitigation measures, as necessary, to comply with applicable noise ordinance standards. Potentially significant until feasibility/effectiveness of mitigation is determined in a subsequent EIR for Phase 2.	Potentially significant Analysis in subsequent EIR required
4.10 Utilities	**Phase 2 Potential Impact 4.10-1**. Relocation of utility lines.	**Mitigation Measure 4.10-1.** In cooperation with local utility service providers, locate all underground utilities in advance of excavation. Notify owners of underground utilities in the area of proposed pipe installation of the nature, extent, and duration of construction activities. Coordinate design efforts with other service	Less than significant Analysis in subsequent EIR required

TABLE ES-2B
Summary of Potentially Significant Impacts and Mitigation Measures for Phase 2

Environmental Resource	Potential Impact	Mitigation	Level of Significance
		agencies to avoid disruption of existing utility lines. If relocation of existing utility lines is required, coordinate with the appropriate service agency to determine relocation requirements and to identify options to avoid or minimize service outages. Use hand tools as necessary to avoid damage to buried utility lines and appurtenances. If planned utility service outages are necessary, provide advance notice to affected utility customers. Whether Phase 2 will affect utilities cannot be identified at this time. However, based on presently available information, the potential impacts, if any, could be reduced to a less than significant level through the implementation of the mitigation measure discussed above.	
4.11 Cultural Resources	**Phase 2 Potential Impact 4.11-1**. Impacts on pre-historic or historic cultural resources	Potentially significant until potential for impact and feasibility of appropriate mitigation is determined in a subsequent EIR for Phase 2.	Potentially significant Analysis in subsequent EIR required
	Phase 2 Potential Impact 4.11-2. Unanticipated discovery of subsurface archaeological deposits	Implementation of Mitigation Measure 3.11-1 may reduce the level of potential impacts. The impact of Phase 2 associated with the unanticipated discovery of subsurface archaeological deposits cannot be identified until the location of Phase 2 facilities is known. However, to the extent that any impacts may occur, they may be reduced to a less than significant level through the implementation of the mitigation measure discussed above.	Less than significant Analysis in subsequent EIR required
4.12 Land Use	None identified. Impact conclusions regarding compatibility with existing land uses and policies cannot be made until Phase 2 facility locations are determined.	None identified. Potentially significant until potential for impact and feasibility of appropriate mitigation is determined in a subsequent EIR for Phase 2.	Potentially significant Analysis in subsequent EIR required
4.13 Visual and Aesthetic	Impact conclusions regarding significance of	To reduce the visual effects of construction activity, EBMUD standard practice for construction crews and contractors requires the following: a) maintain	Potentially significant Analysis in subsequent

TABLE ES-2B
Summary of Potentially Significant Impacts and Mitigation Measures for Phase 2

Environmental Resource	Potential Impact	Mitigation	Level of Significance
Resources	visual and aesthetic impacts of Phase 2 facilities cannot be made until Phase 2 facilities are designed and located.	construction sites and all stored items in a neat and orderly condition; b) dispose of refuse as often as necessary so that at no time will there be any unsightly accumulation of rubbish; c) sweep the street in the work area; and d) remove scrap material, debris, and waste from the job site. Whether impacts to visual and aesthetic resources would occur as a result of Phase 2 cannot be determined at this time and are therefore considered potentially significant until impact analysis and feasibility of appropriate mitigation is determined in a subsequent EIR for Phase 2.	EIR required

1.0 Introduction

The Bayside Groundwater Project involves the injection of potable drinking water into the South East Bay Plain Basin (SEBPB) during wet years for storage and later recovery and use during a drought. The project consists of two phases. Phase 1 is proposed for immediate implementation and involves the use of an existing well with an annual capacity of 1 million gallons per day (mgd) (maximum operating capacity of 2 mgd), and the construction of associated pumping and treatment facilities adjacent to the well in the San Lorenzo area. Phase 2 is the potential future expansion of groundwater facilities by an average annual capacity of between 2 and 10 mgd. If the Phase 2 expansion is pursued in the future, it may be located in the same general area of San Lorenzo where Phase 1 is proposed to be located, in portions of San Leandro or Oakland, or in some combination of these locations.

Phase 1 is the focus of this Draft Environmental Impact Report. EBMUD has made no commitment to implement Phase 2. EBMUD intends to use the information gathered from Phase 1 operations to help inform its future determinations on whether to proceed with Phase 2, and if so, to guide EBMUD in developing the Phase 2 design and operation features. If EBMUD determines to implement Phase 2, EBMUD will at that time complete a subsequent EIR. However, to the extent EBMUD can analyze the potential impacts of Phase 2 at this time, that analysis is included in Section 4.0 of this DEIR.

In March 2001, EBMUD circulated a DEIR (2001 DEIR) on the Bayside Groundwater Project (SCH No. 2000092044). The 2001 DEIR evaluated the impacts of developing multiple injection wells in the San Lorenzo area with a collective annual capacity of 15 mgd. The DEIR analyzed a number of well locations, a treatment plant facility location, and pipeline alternatives. Based on comments received on the DEIR, the District subsequently conducted focused studies that have led to substantial project changes that eliminate potentially significant impacts or reduce the severity of the impacts that remain.

Rather than revise the 2001 DEIR to analyze the modified project, EBMUD has prepared this new Bayside Groundwater Project DEIR (SCH No. 2000092044). An overview of the project is set forth in Section ES.2.4 and is fully described in Section 2.0 (Project Description) of this DEIR.

The project, as revised, involves the injection of potable drinking water into the SEBPB during wet years for later recovery and use during a drought. As analyzed in this DEIR, the project is proposed in two phases. Phase 1 would be implemented immediately to provide an annual capacity of 1 mgd. Phase 2 is the potential future expansion of groundwater facilities with an annual capacity of between 2 and 10 mgd. The project is fully described in Section 2.0 (Project Description) of this DEIR.

Table B-1 in Appendix B summarizes comments received during the public comment period for the 2001 DEIR and identifies the sections in this DEIR in which these issues are addressed.

A new Notice of Preparation (NOP) was submitted to the State Clearinghouse on October 22, 2004 as required by the CEQA Guidelines.

1.1 Need for the Project

When the original EBMUD system was planned in the early 1920s, the District acquired rights to 200 mgd of water from the Mokelumne River. Pardee Dam was built to store that water during high river flows from spring snowmelt and rains. After World War II, the East Bay population grew rapidly, and EBMUD was granted water rights for another 125 mgd of Mokelumne River water. By the early 1960s, EBMUD was predicting more shortages as growth continued in the East Bay. In 1964, completion of Camanche Reservoir below Pardee Reservoir provided more ways to regulate Mokelumne River flows. Camanche's 417,000-acre-foot (AF) capacity is used to meet agricultural and fishery needs on the lower Mokelumne River, provide flood control, and allow EBMUD to hold a larger supply of water in Pardee Reservoir. Briones Reservoir, north of Orinda, was also completed in 1964 and provides another 60,000 AF of storage for water supplies in the East Bay. Rainfall and snowmelt collected in Pardee Reservoir are transported 82 miles through the Mokelumne Aqueduct system, as shown in Figure 1-1.

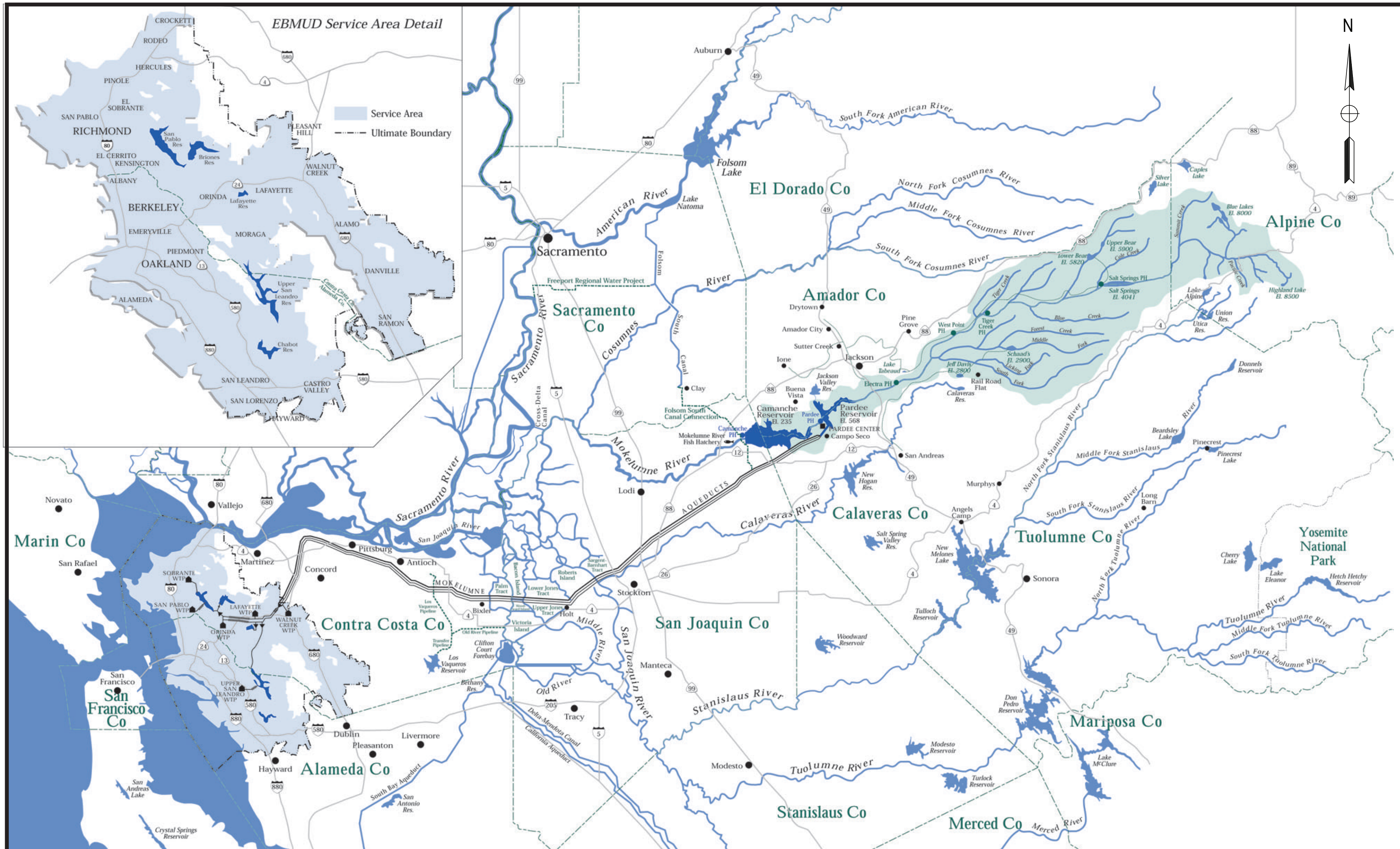
Despite successful water conservation and water recycling programs, EBMUD's Mokelumne River supply is no longer sufficient to provide reliable water supplies during a drought without resulting in substantial economic impacts on its customers. The needs of new residential, business, and industrial customers within the EBMUD service area would be almost entirely offset in normal years by existing and planned conservation and water recycling projects. However, in drought years, EBMUD's present supply is not sufficient to meet its needs, even with substantial rationing. Moreover, in the next 20 years, increased diversions by senior water rights holders and increased flows for resource protection in the Mokelumne River and the San Francisco Bay/Sacramento–San Joaquin River Delta (the Delta) will decrease the available supply of water for the EBMUD service area.

The Bayside Groundwater Project would provide a local supplemental water supply that is not dependent on operation of Pardee facilities and that would reduce the impact of diminished Sierra water supplies during successive dry years.

1.2 Purpose of the EIR

The purpose of this DEIR is to analyze the affects of the Proposed Project on the physical environment, as required by CEQA. The DEIR describes the project and its environmental setting, identifies impacts and mitigation measures for impacts found to be significant, analyzes cumulative impacts, and discusses project alternatives. Impacts are categorized as follows:

- No impact
- Less than significant
- Less than significant with mitigation
- Potentially significant; analysis in subsequent EIR required (Phase 2 impacts only)



Source: EBMUD 2003

FIGURE 1-1
EBMUD WATER SUPPLY SYSTEM
EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
RECIRCULATED DRAFT EIR

CH2MHILL

169710.26.ZZ•Fig 1-1 WaterSupplySystem•7/31/03•ez•SFO

Significance criteria, based primarily on those recommended by the CEQA Guidelines, were established for each environmental topic analyzed in this DEIR and are defined at the beginning of each impact analysis section. The mitigation measures presented in this DEIR are intended to reduce potentially significant impact(s) where identified to a level of insignificance.

In addition to complying with CEQA requirements for approval of the project, the EIR will be used to support issuance of permits by agencies with jurisdiction over certain aspects of the project. A list of required permits for Phase 1 is shown in Table 2-2.

Because EBMUD does not know whether it will pursue Phase 2, or if the District does pursue Phase 2, exactly what facilities will be necessary, this EIR only addresses Phase 2 qualitatively. In-depth discussion of potential impacts of Phase 2, if implemented, would be analyzed in a subsequent EIR that would be prepared when details became available on Phase 2 operation and facilities.

1.3 EIR Process

1.3.1 Notice of Preparation (NOP)

An NOP for the Bayside Groundwater Project (Appendix A) was submitted to responsible and trustee agencies and to the State Clearinghouse on October 22, 2004 in accordance with Section 15082 of the CEQA Guidelines.

As provided in CEQA Guidelines Section 15060(d), EBMUD as lead agency determined that an EIR is clearly required for this project, eliminated development of an Initial Study, and began work directly on the EIR process laid out in the CEQA Guidelines. As indicated in the NOP, EBMUD has focused the EIR on the significant effects of the project. In Section ES.3, the DEIR explains briefly the reasons for determining that certain environmental resources would not be significantly affected by either Phase 1 or Phase 2 of the project.

The impacts identified in this DEIR for the Phase 1 portion of the project are confined to the Alameda County area. The District determined that the Bayside Groundwater Project is not a project of statewide, regional, or areawide significance as defined in CEQA Guidelines Section 15206; hence, the scoping meeting described in Section 15083(c)(1) was not required.

EBMUD has fulfilled the Public Consultation process recommended in CEQA Guidelines Section 15083 through several means. First, District staff has coordinated extensively with those responsible agencies most directly affected by the project through formal and informal consultation before and during the EIR preparation process. Second, EBMUD formed a Community Liaison Group (CLG) to facilitate an orderly exchange of information about the project with local stakeholders. The CLG was created specifically in response to citizen and public official requests for such a forum.

1.3.2 Public Review of the Draft EIR

Notice of Availability of the DEIR was provided in accordance with CEQA Guidelines Section 15105. Specific notice was sent to all persons and agencies that commented on the 2001 DEIR and to all other persons and agencies that requested notice.

Publication of this DEIR marks the beginning of a 45-day public review period, during which written comments may be sent to:

Angela Knight (MS 407)
East Bay Municipal Utility District
375 Eleventh Street
Oakland, California 94607-4240

In accordance with CEQA Guidelines Section 15085, a Notice of Completion was sent to the State Clearinghouse in the Governor's Office of Planning & Research. EBMUD has requested comments from Responsible and Trustee agencies, and agencies with jurisdiction over resources affected by the project, as required under CEQA Guidelines Section 15086.

1.3.3 Action on the Final EIR and Project

Written and oral comments received in response to the DEIR will be addressed in a Response to Comments document that, together with the DEIR, will constitute the Final EIR.

The Final EIR will be subject to certification by the EBMUD Board of Directors prior to approval of Phase 1 of the project. This EIR will not be used to approve the Phase 2 potential future expansion of the project. Phase 2 will not be approved until EBMUD completes a subsequent EIR on Phase 2 facilities and operations, in compliance with CEQA.

1.3.4 Mitigation Monitoring and Reporting

CEQA requires that when an agency makes findings on significant effects identified in an EIR, the agency must adopt a program for reporting or monitoring mitigation measures that were adopted or made conditions of the approval of the project (CEQA Guidelines Sections 15091 [d] and 15097). The purpose of the mitigation monitoring or reporting program is to ensure that the mitigation measures identified in the certified EIR are implemented.

1.4 Water Demands and Water Supply Planning

1.4.1 Demand Projections

EBMUD's estimations of water demand are supported by the 1993 Updated Water Supply Management Program (WSMP) and the Districtwide Update of Water Demand Projections (2000 Demand Study). Both the 1993 WSMP and the 2000 Demand Study based water demand projections on population growth. However, the 2000 Demand Study examined future land use changes designated in the adopted general plans and specific plans of cities and counties in the EBMUD service area. The 2000 Demand Study forecast a demand of 277 mgd by 2020, adjusted to 229 mgd when savings from conservation and recycled water programs are taken into account. Table 1-1 summarizes the water demand projections.

The increase in Districtwide demand between 2000 and 2010 reflects the rapid rate of development anticipated by many of the cities in the service area. The continued but slower increase in demand beyond 2010 reflects a more built-out service area, with changes in land uses resulting in higher density use. These results are consistent with projections in the WSMP, which forecast a 229 mgd demand in year 2020 with conservation and recycling (EBMUD 2001).

TABLE 1-1
Projected Water Demand

	Demand in Millions of Gallons per Day, by year				
	2000	2005	2010	2015	2020
Customer demand[a]	230	242	257	267	277
Adjusted for conservation[b]	(8)	(14)	(20)	(27)	(34)
Adjusted for recycled water[c]	(6)	(9)	(11)	(12)	(14)
Planning level of demand	216	219	226	228	229

a Demand taken from the 2000 Demand Study.
b Conservation water savings taken from the Water Conservation Master Plan 1999 Annual Report. Two mgd in 1999 and 34 mgd for 2020. Linearly interpolated into 5-year increments.
c Recycled water use was obtained from staff in the Office of Recycling and from Chapter 5 of the UWMP.
Source: East Bay Municipal Utility District 2001.

1.4.2 Water Conservation

EBMUD's water conservation programs address both supply and demand. Demand-side conservation programs improve customer water-use efficiency and include incentives, education, support, and regulation. Supply-side water conservation programs improve water-use efficiency, and include distribution system leak detection, repair programs, and water recycling programs. The Amended Water Conservation Master Plan programs are projected to save 17 mgd in 2020. An additional 17 mgd in demand-side conservation is expected to result from installation of conservation hardware such as toilets, showerheads, and faucets independent of an EBMUD program.

EBMUD's water distribution system includes more than 3,900 miles of pipeline. The pipelines are vulnerable to leaks, corrosion, and other damage or water loss. Systematic replacement of troublesome pipes, installation of cathodic protection, and improved leak detection methods have stabilized the leak rate.

1.4.3 Recycled Water

EBMUD completed a draft Water Reclamation Master Plan in 1991. The District currently has six recycled water projects in place, which result in savings of approximately 6 mgd of potable water. Future water recycling efforts are expected to reduce demands on potable water by an additional 8 mgd by the year 2020. The six existing projects use wastewater from four treatment facilities owned and operated by three different utilities in EBMUD's service area, and were selected because they are cost effective.

1.4.4 Mokelumne River Water Supply

Water delivered to EBMUD's customers comes primarily from the Mokelumne River, where it is diverted to the District's Mokelumne Aqueducts or to storage under two State-issued water rights: License 11109 (Pardee Reservoir) and Permit 10478 (Camanche and Pardee Reservoirs). This Mokelumne water supply is supplemented by runoff to local reservoirs, which is sent to treatment plants or stored under three additional water rights: License 1749

(San Pablo Reservoir), License 1750 (Upper San Leandro Reservoir), and License 10797 (Briones Reservoir).

The exercise of these rights is limited by hydrologic conditions and upstream use and by obligations to release water downstream for fishery habitat preservation, use by riparians and other senior right-holders, and inflow to the Delta. Normally, more water is available under EBMUD's rights than the District can actually store or put to use; but during droughts, EBMUD customers' needs cannot be fully and reliably met even when direct diversions are augmented from storage.

Runoff, both to the Mokelumne River and particularly to EBMUD's local reservoirs, varies greatly from year to year. For example, during the past 40 years, runoff to Upper San Leandro (USL) ranged from only 2,000 AF in 1977 to 46,000 AF in 1983. In half of all years during this 40-year period, runoff to USL was 15,000 AF a year or more, greatly exceeding the amount proposed for Bayside groundwater injection.

Storage levels in the local reservoirs are kept within predetermined ranges according to "rule curves," which vary seasonally but not year to year. The rule curves keep local storage levels high enough to meet East Bay customers' water needs for six months in the event of a Mokelumne supply outage, but low enough to capture the runoff from local storms and minimize the risk of uncontrolled spills. When necessary, water is transferred to the local reservoirs from Pardee to maintain the six-month emergency standby reserve.

Hydroelectric generators installed at Pardee and Camanche Dams operate under State-issued water rights, and a Federal Energy Regulatory Commission (FERC) hydropower license as well. In 1998, EBMUD agreed to modifications to its FERC license that ensure greater protection for the downstream fisheries. At the same time, EBMUD agreed to a "gainsharing" provision under which 20 percent of the actual yield of additional water supplies developed by EBMUD from the new facilities, up to a maximum of 20,000 AF during any drought period, would accrue to the Mokelumne fisheries.

Accordingly, 20 percent of the yield of the Bayside Groundwater Project will result in a corresponding reduction in Mokelumne water import during droughts (if the 20,000 AF per drought cap is not reached), and the remaining 80 percent will go to increased water availability and water service reliability during droughts for EBMUD's customers.

1.4.5 Terminal Storage Reservoirs

EBMUD maintains five terminal reservoirs in its East Bay service area that regulate EBMUD's Mokelumne River supply in the winter and spring, augment EBMUD's water supply with local runoff, provide emergency sources of supply, and offer recreational benefits to the communities of the East Bay. Together, the terminal reservoirs have a usable capacity of approximately 138,000 AF.

EBMUD compared the volume of local runoff in the USL (that supplies the service area encompassing the project) to the volume of water that would potentially be injected. To account for the effects of storage operations on the District's ability to develop the local runoff, the District compared the volume of local runoff that is actually delivered to District customers by the USL water treatment plant to the volume of water that would have been needed for Bayside Protect injection.

Given that USL contains both imported Mokelumne water and local runoff, the first step in this analysis was to develop a simple monthly water balance model to account for the quantity of water in the reservoir from each source. The water balance model assumed that initially the reservoir contained an equal amount of water from each source. Then for each month thereafter the volume of water imported from the Mokelumne was added to a Mokelumne account and the local runoff was added to a local account. Monthly reservoir depletions, spills, evaporation, and diversions by the treatment plant were then subtracted from each of the accounts based on the percentage of the total reservoir storage in each account. For example, if 60 percent of the water in the reservoir is local runoff, then 60 percent of the spills, evaporation, and treatment plant use would be taken from the local account. The results of the water balance model, shown in Figure 1-2, indicate that the volume of local runoff produced by the USL treatment plant exceeds the volume that would be injected by the project. Thus, there is sufficient local runoff developed by USL operations alone to supply water for injection into the Bayside aquifer.

EBMUD would divert water for aquifer recharge from any of several sources, including local watershed runoff and conserved Mokelumne River water. The project would not reduce Mokelumne Project storage levels or river flows during times of low runoff, and therefore, Mokelumne water temperatures, fish habitat availability, reservoir recreation, and water availability for consumptive use would not be negatively affected by the project.

1.4.6 USBR Amendatory Water Service Contract and Freeport Regional Water Project

In 1970, EBMUD signed a water service contract with the U.S. Bureau of Reclamation (USBR), which administers the Central Valley Project for the delivery of American River water from the Folsom South Canal. In 2001, this contract was amended to provide for delivery of water from three possible diversion points, with defined water amounts for each location.

At Freeport on the Sacramento River, EBMUD can take delivery of up to 133,000 AF of American River water annually, not to exceed a total of 165,000 AF in a three-consecutive-year period of drought in any year when EBMUD's total system storage is forecast to be below 500,000 AF. At Site 5 on the American River (upstream of I-5 crossing), as defined in the December 2000 Environmental Impact Statement (EIS) for the Amendatory Contract, and from the Folsom South Canal diverting water from the Nimbus Dam, EBMUD can take delivery of up to 150,000 AF annually. The contract details the required conditions specific to each diversion point that must be met before taking delivery of the entitled water.

In 2002, EBMUD and the Sacramento County Water Agency, in association with the City of Sacramento and with support from the U.S. Bureau of Reclamation, formed the Freeport Regional Water Authority, which is responsible for the joint effort to draw water from the Sacramento River near the unincorporated town of Freeport. The Final EIR/EIS for the Freeport Regional Water Project (FRWP) was certified in April 2004. Engineering design work is planned for completion in Spring 2006, with construction to be completed in 2009.

The FRWP is capable of providing a substantial portion of EBMUD's year 2020 supplemental water supply need. However, the FRWP and the Bayside Groundwater Project together would not fully meet the additional water need for year 2020. Other sources of supplemental water would be needed just to maintain the Districtwide multiple-year drought rationing limit of 25 percent.

1.5 Mokelumne Water Supply Reliability

EBMUD's experiences during recent droughts demonstrate that its water supply system is not sufficiently reliable to provide safe, continuous water service during droughts. The District's "Water Supply Availability and Deficiency" policy limits drought demand reductions to no more than 25 percent Districtwide. Instead of immediately imposing 25 percent rationing whenever dry periods occur or postponing action until drought conditions are severe and supplies severely depleted, EBMUD has developed guidelines (Table 1-2) that call for increasing amounts of rationing as supplies become increasingly diminished. By imposing some rationing in early years of potentially prolonged drought periods, the necessity of more severe rationing in subsequent years is minimized.

TABLE 1-2
Drought Management Program Guidelines

Drought Stage	Projected End-of-September Total System Carryover Storage	Reduction Goal
None	500 TAF or more	None
Moderate	500-450 TAF	0 to 15%
Severe	450-300 TAF	15 to 25%
Critical	300 TAF or less	25%

Source: East Bay Municipal Utility District 2001

Note: TAF = thousand acre-feet

EBMUD has developed a three-year drought planning sequence. Based on its long-term water supply planning, the District has determined that a supplemental supply of 185,000 AF over that three dry-year sequence would be sufficient to meet the District's water supply needs, taking into account implementation of the planned conservation and reclamation programs (Freeport Regional Water Authority 2003). This determination also assumes implementation of emergency water-use reduction programs during droughts to reduce demand by an additional 25 percent. The earlier a supplemental water supply is delivered during a drought, the more effective it becomes for water supply purposes.

1.6 Other EBMUD Water Planning Activity

1.6.1 San Joaquin County Conjunctive Use

EBMUD began working with San Joaquin County water interests for a groundwater banking and conjunctive use program in 1992. However, County water interests and EBMUD have been unable to agree upon a project. Discussions continue about potential conjunctive use, but no project had been defined at the time that this DEIR was published.

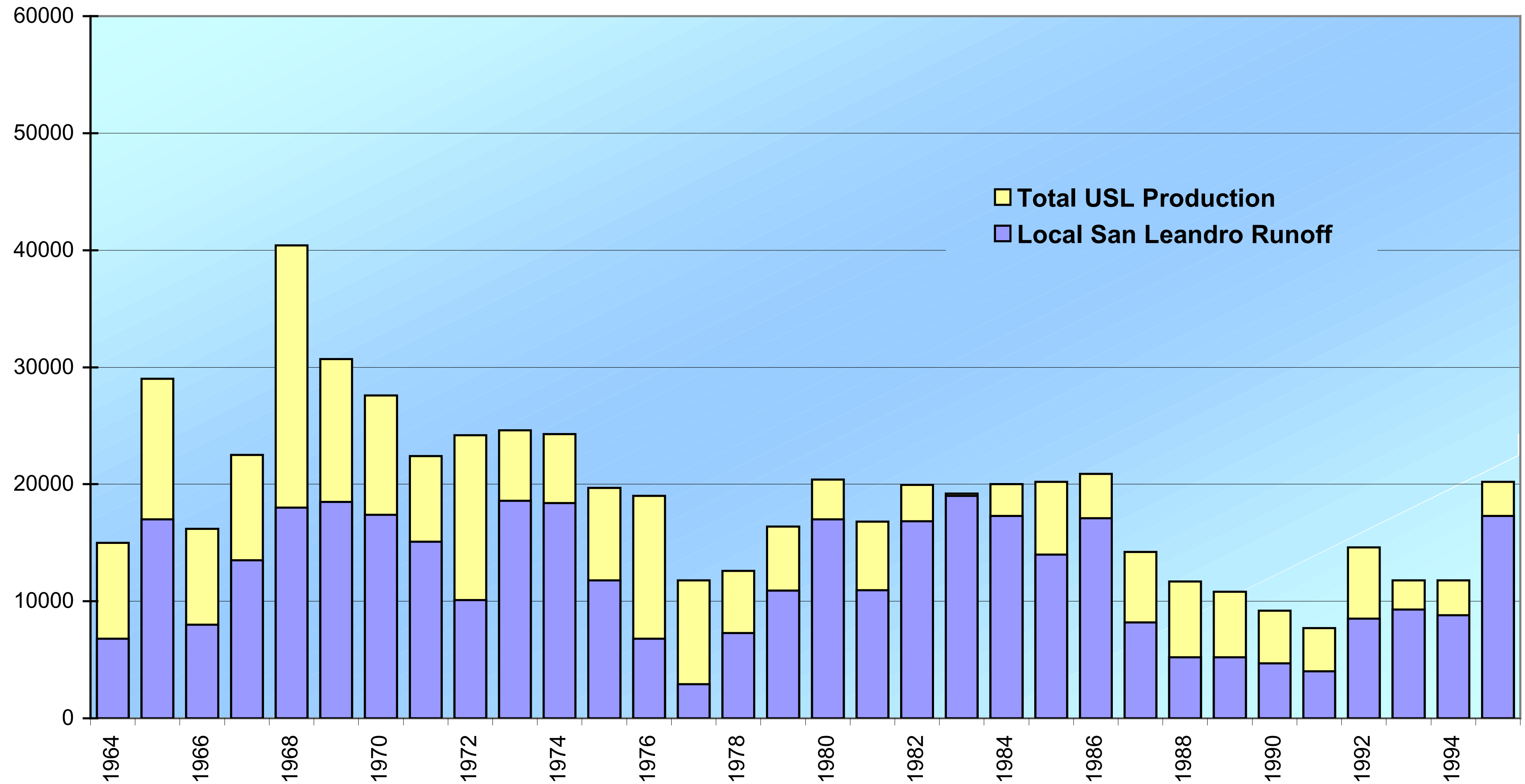


FIGURE 1-2
UPPER SAN LEANDRO RESERVOIR PRODUCTION
EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

1.6.2 Enlarge Pardee Reservoir

Pardee Dam, completed in 1929, is a 350-foot-high curved concrete gravity dam with a crest length of approximately 1,330 feet. A replacement dam to enlarge Pardee Reservoir would be located 4,200 feet downstream of the existing dam, near the confluence of Rag Gulch with the Mokelumne River. The replacement dam would be approximately 42 feet higher than the existing dam. Major project elements would include: (1) replacement of the concrete dam and spillway, powerhouse, and saddle dams, (2) modifications to the intake tower, (3) modifications to Pardee Tunnel, and (4) development of a pressure reduction facility.

Predesign, design, and construction activities for the replacement dam are anticipated to require a minimum of seven years. EBMUD is not pursuing this option because of the cost and the extensive water rights amendments that would be necessary.

1.6.3 East Bay Groundwater Program

In October 1996, the EBMUD Board of Directors directed staff to study the feasibility of conjunctive use[1] within the District's service area as a dry-year water supply. The District's efforts included hydrogeologic evaluations of groundwater resources in the SEBPB, Castro Valley, San Ramon Valley, Berkeley, Richmond/San Pablo, and Walnut Creek. EBMUD also undertook cooperative studies of the SEBPB with the Alameda Flood Control and Water Conservation District and the U.S. Geological Survey. These studies demonstrated that within the District service area, the area with the greatest potential for groundwater development is western San Lorenzo and San Leandro, including the project area for the Bayside Groundwater Project. Subsequently, the EBMUD Board directed staff to initiate the technical and environmental analyses necessary to develop a conjunctive use project in the SEBPB, as described in this DEIR.

1.6.4 Regional Intertie Project

In April 2003, EBMUD, the San Francisco Public Utility Commission (SFPUC), and the City of Hayward approved the Intertie Project for emergency maintenance and operations. The Intertie would originate from EBMUD's southwestern service area through the City of Hayward distribution network and could provide water to EBMUD or Hayward customers during emergencies. The intent of this project is to give the District and neighboring agencies increased flexibility to provide water throughout the region during an emergency. However, this project does not provide a supplemental water supply.

Construction of the Intertie Project is anticipated to take up to 12 months. The projected start of construction is early 2005.

1.6.5 Regional Desalination Project

Desalination removes salts from seawater to produce fresh water through distillation or filtration. In 2002, several Bay Area water agencies including EBMUD, SFPUC, Contra Costa Water District, and the Santa Clara Valley Water District began jointly exploring development of regional desalination facilities. The agencies developed the conceptual Bay

[1] Use of a groundwater aquifer to store potable drinking water and subsequent recovery of both the stored water and native groundwater.

Area Regional Desalination Project, which could (1) provide additional source(s) of water during emergencies, (2) provide an alternative water supply that would allow major facilities to be taken out of service for an extended time for inspection, maintenance, or repairs, and (3) provide a supplemental supply during drought periods.

At the time that this DEIR was published, the partner agencies were actively working on additional studies to identify project sites and capacity.

1.7 References – Introduction

EBMUD. 2001. *Urban Water Management Plan 2000*. Water Resources Projects Division. February.

EBMUD. 2000. *District-wide Update of Water Demand Projections*.

__________. 1993. *Final EIR for the Updated Water Supply Management Program (WSMP): Prepared for East Bay Municipal Utility District*.

Freeport Regional Water Authority. 2003. *Freeport Regional Water Project Draft Environmental Impact Report/Environmental Impact Statement*. July.

2.0 Project Description

2.1 Introduction

The Bayside Groundwater Project involves the injection of potable drinking water into the South East Bay Plain Basin during wet years for storage and later recovery and use during a drought. The project consists of two phases. Phase 1 is proposed for immediate implementation and involves the use of an existing well with an annual capacity of 1 mgd, and the construction of associated conveyance and treatment facilities adjacent to the well in the San Lorenzo area. Phase 2 is the potential future expansion of project capacity to between 2 and 10 mgd. If the Phase 2 expansion is pursued in the future, required facilities may be located in the same general area of San Lorenzo where Phase 1 facilities are proposed to be located, in portions of San Leandro or Oakland, or in some combination of these locations.

Phase 1 is the focus of this DEIR. EBMUD has made no commitment to implement Phase 2. EBMUD intends to use the information gathered from Phase 1 operations to help inform its future determinations on whether to proceed with Phase 2, and if so, to guide EBMUD in developing the Phase 2 design and operation features. If EBMUD determines to implement Phase 2, EBMUD would at that time complete a subsequent EIR. However, to the extent EBMUD can analyze the potential impacts of Phase 2 at this time, that analysis is included in Section 4.0 of this DEIR.

2.2 Background

In October 1993, EBMUD adopted the Water Supply Management Program, which is a planning guide for providing water to the EBMUD service area through the year 2020. The WSMP demonstrated that EBMUD's existing water supplies are insufficient to meet current and future customer demand during droughts even with implementation of significant water conservation and water reclamation programs and an aggressive dry-year water rationing policy. Thus, if the District does not expand its water supply in the near term, EBMUD customers could experience severe water shortages during prolonged droughts.

In 1997, EBMUD drilled a demonstration well to investigate the feasibility of utilizing deep aquifers in the SEBPB for groundwater storage and recovery. The demonstration well was installed on a site adjacent to the Oro Loma Sanitary District (OLSD) Wastewater Treatment Plant at 2600 Grant Avenue in San Lorenzo. The well was drilled to a depth of 665 feet. Studies of the demonstration well's operation verified that potable water can be injected successfully into the Deep Aquifer and stored for later recovery. Studies also demonstrated that the aquifer has sufficient existing groundwater to contribute a portion of the expanded water supply needed in future drought events.

In March 2001, EBMUD circulated a Draft EIR (SCH #2000092044) that evaluated development of a multiple-well project in the San Lorenzo area with the objective of developing a 10,000- to 15,000-acre-foot (AF) per year (9 to 14 mgd) capacity drought year water supply in the East Bay Groundwater Basin. EBMUD received and carefully reviewed extensive comments on the 2001 DEIR. The District then conducted additional studies of groundwater basin impacts, water quality, and potential subsidence in the EBMUD service area related to pumping. EBMUD also worked closely with other agencies to examine the potential effects of the project on groundwater resources in communities outside of its service area.

As a result of its review of comments on the 2001 DEIR and its subsequent analysis of groundwater issues, EBMUD substantially revised the project. The revisions eliminate or significantly reduce the potential impacts of the project identified in the 2001 DEIR. Rather than edit the 2001 DEIR to analyze the impacts of the revised project, this new Bayside Groundwater Project Draft Environmental Impact Report (DEIR) (SCH No. 2000092044) has been prepared to fully review the revised project.

Under Phase 1 of the Bayside Groundwater Project described in this DEIR, EBMUD would convert the existing 1997 demonstration well at OLSD to a permanent potable water source with an annual capacity of 1 mgd (1,121 AF per year). Water levels, water quality, and ground surface elevations would be monitored extensively during operation of Phase 1 to assess the feasibility and potential effects of expanding capacity to 2 to 10 mgd if and when EBMUD decides to implement Phase 2.

2.3 Project Objectives

The District's overall objectives for the Bayside Groundwater Project are:

- To reliably provide more water for customer use during drought periods than would be available from current water supplies alone,
- To make beneficial use of local water resources, and
- To provide water that complies with state and federal drinking water standards while maintaining or enhancing basin water quality.

Additional project objectives are:

- To initiate EBMUD groundwater use within the SEBPB to prepare for both near-term (less than five years) and future drought conditions, and
- To collect data to inform decision making regarding (1) whether it is appropriate to implement a Phase 2 larger-capacity facility and, if so, (2) how to design it.

2.4 Project Description

The Proposed Project site is located within the unincorporated area of Alameda County known as San Lorenzo. Figure 2-1 shows the Proposed Project location and the boundaries of the affected groundwater basins.

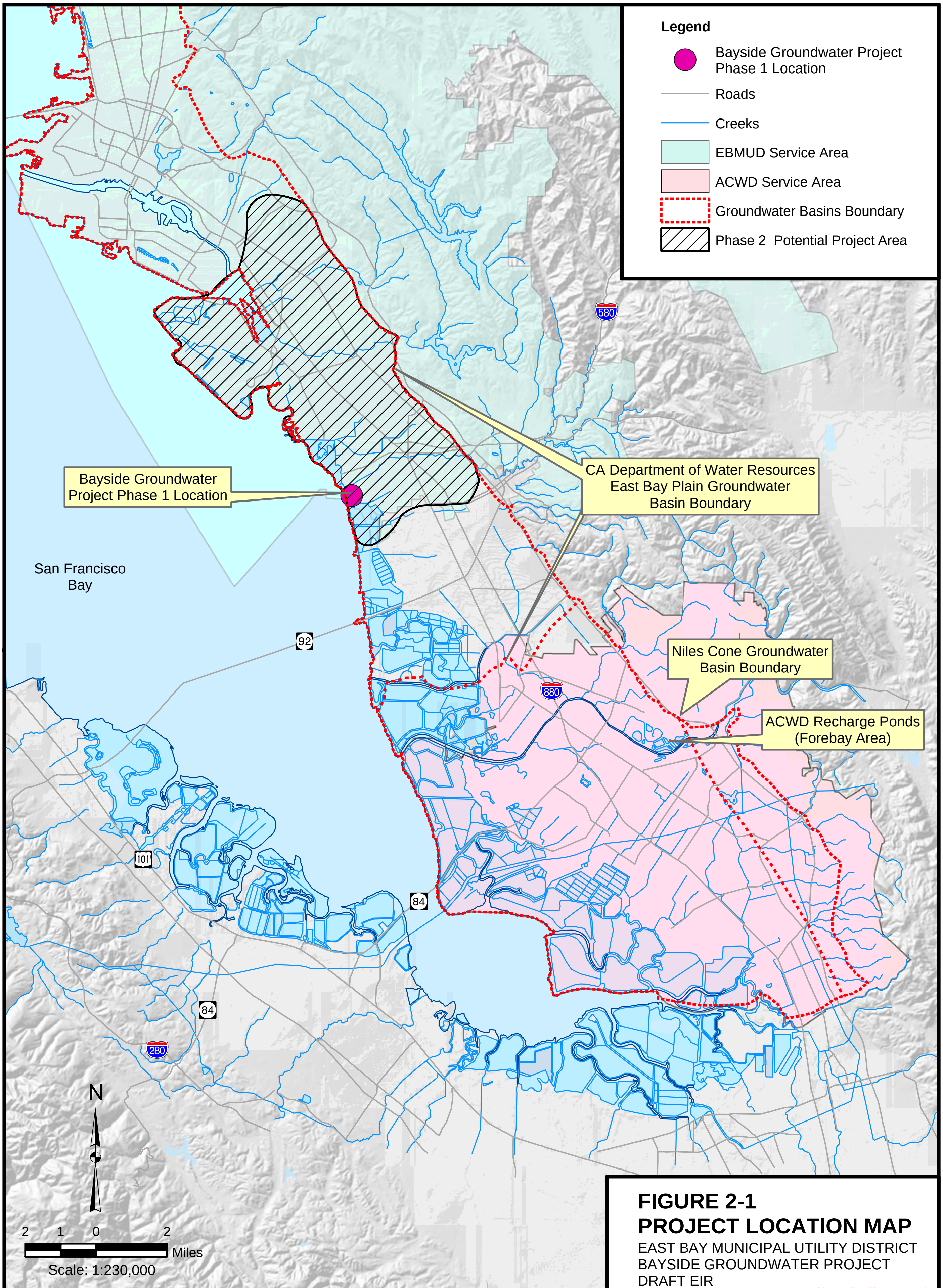


FIGURE 2-1
PROJECT LOCATION MAP
EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

CH2MHILL

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PROJECT_LOCATION_MAP.PDF 2/23/2005 15:26:23

The project is designed to inject potable drinking water into the SEBPB during wet years for storage, and to later recover and use groundwater during a drought. Implementation of the project is planned in two phases:

Phase 1 – Initial project with 1 mgd annual capacity using the existing 1997 demonstration well and constructing associated facilities adjacent to the existing well in the San Lorenzo area.

Phase 2 – Potential future expansion of groundwater facilities to between 2 and 10 mgd average annual capacity. If Phase 2 is pursued, its facilities may be located in the same general San Lorenzo area where Phase 1 is proposed to be located or in a broader geographic area, including venues in San Lorenzo, San Leandro, and/or Oakland.

Figure 2-2 depicts the two phases of the project. Figure 2-2 also indicates the level of environmental analysis provided for the topics addressed in this DEIR. Certification of this DEIR, and acquisition of required permits, would allow for implementation of Phase 1 only.

In this DEIR, Phase 2 (2 to 10 mgd annual capacity) is analyzed to the extent that the location, design features, potential impacts, and required feasible mitigation measures are known.

Table 2-1 shows the features of both Phases 1 and 2. Sections 2.4.1 and 2.4.2 below provide additional details about the facility locations and operations for Phases 1 and 2, respectively.

2.4.1 Phase 1 Project Description

2.4.1.1 Phase 1 Facilities

EBMUD proposes using the existing 1997 demonstration well, with an annual average yield of 1 mgd, to be operated for a portion of drought years at a maximum 2 mgd extraction rate. Annual production would not exceed 1,120 AF. The facilities required for Phase 1 are described below and would be located within the unincorporated area of Alameda County known as San Lorenzo. The location of Phase 1 facilities is shown on Figure 2-3, and a detailed site layout is shown on Figure 2-4**.**

(Existing) Bayside Well No. 1

The existing 1997 demonstration well (referred to in this DEIR as Bayside Well No. 1 and depicted in Figure 2-5) is located on property adjacent to the OLSD Wastewater Treatment Plant at 2600 Grant Avenue in San Lorenzo. This well was developed as a full-scale demonstration well during the pre-project pilot testing period. Access to the well would be from Grant Avenue through the OLSD wastewater treatment plant.

Wellhead Treatment Facility

The treatment facility at Bayside Well No. 1 would consist of an approximately 1,250-square-foot building, filters, tanks, a transformer pad, and a generator pad. A small structure would enclose the wellhead and treatment equipment. The total area of the facilities to be constructed near the wellhead would be about 3,000 square feet. The wellhead treatment facility, if needed, would filter manganese and iron to ensure that the concentrations of these minerals would meet drinking water standards. Wellhead treatment would also include fluoridation and chloramination, pH adjustment for corrosion control, and backwash tanks for settling the well backflush water. The backflush water would be released to the existing storm drain and sanitary sewer systems in accordance with any necessary drainage permits.

The treatment facility would house both storage and dispensing equipment for chemicals required for treatment. The chemicals and required storage capacity are listed below:

Chemical	Storage Capacity (gal)
Caustic (NaOH)	1,000
Chlorine (NaOCl)	1,500
Fluoride (H_2 SiF_6)	400
Ammonia (NH_4OH)	300
Bisulfite ($NaHSO_3$)	300

Although the well and wellhead treatment facilities are minimally visible from the westerly terminus of Grant Avenue, EBMUD would landscape the site and provide fencing and security lighting.

Inlet-Outlet Line

A short steel inlet pipeline would convey treated water to the Bayside Well No. 1 during injection operations. During extraction, an outlet line would convey recovered, treated groundwater to the existing 12-inch-diameter distribution main at Grant Avenue. Phase 1 would not require a new transmission pipeline along Grant Avenue.

Extensometer and Monitoring Well System

A key component of Phase 1 would be extensive monitoring to measure changes in water levels, water quality, and ground level elevations (subsidence). A deep, precision-drilled extensometer with instrumentation below ground at various levels would be installed on EBMUD property just east of Phase 1Bayside Well No. 1 to measure ground movement. EBMUD would use the network of small-diameter monitoring wells already in the Phase 1 area and the extensometer system to collect water level and ground surface elevation data during Phase 1 operation to verify subsidence characteristics. Water-level monitoring would provide information on groundwater basin effects, which would aid in groundwater modeling and management efforts with other water agencies and would help inform EBMUD's future decisions on whether and how to proceed with Phase 2.

2.4.1.2 Phase 1 Operations

The subsections below describe the startup and sustained operations and maintenance of Phase 1.

Startup Testing

EBMUD would operate Phase 1 for up to 1 year after completion, irrespective of whether drought conditions prevail in the service area at that time. This initial operation period would ensure that the facilities function as planned and would allow the District to gather new water-quality data and water-level measurements in the deep and shallow groundwater of both the SEBPB and the Niles Cone Groundwater Basin (NCGWB). These data would assist EBMUD in making future determinations on whether and how to proceed with Phase 2.

BAYSIDE GROUNDWATER PROJECT ENVIRONMENTAL IMPACT REPORT

Project Components
1. Initial 1 mgd Groundwater Project
2. Potential Future Expansion of up tp 10 mgd

Project Objectives
- To reliably provide more water for customer use during drought periods than would be available from current water supplies alone
- To make beneficial use of local water resources
- To provide water that complies with state and federal drinking water requirements, and to maintain and/or enhance basin water quality
- To complete the project in the near-term (2-5 years) to prepare for drought conditions

Will be evaluated in this DEIR. All impacts to be discussed sufficiently to allow for project approval of the 1 MGD project.

Impacts of the up to 10 mgd are discussed to the extent known. A subsequent EIR will be required when details of the potential expansion are developed.

PHASE 1 - Immediate Implementation, 1 MGD

Objectives:
- Same objectives as for overall Project PLUS
- To initiate EBMUD groundwater use within the South East Bay Plain Basin to prepare for both near-term and future drought conditions
- To collect data to inform decisionmaking regarding (1.) whether it is appropriate to proceed with a Phase-2 larger-capacity facility and, if so, (2.) how to design it

PHASE 1 - Facilities:

- Existing Bayside Well No. 1
- 1,250 square-foot building adjacent to well housing treatment chemi_ cals and pressure filters
- Inlet/Outlet Pipeline to 12-inch mainline on Grant Avenue
- Backwash Tanks
- Monitoring well network to measure water levels and water quality
- Extensometer Field to measure ground level changes
- Site security and Landscaping

PHASE 2 - Potential Future Expansion to add between 2 and 10 MGD

Objectives:
- Same objectives as for overall Project

PHASE 2 - Potential Facilities:

- Up to four additional wells (specific sites unknown)
- Transmission pipeline(s)
- Expanded monitoring system
- Treatment at well sites or centralized treatment
- Could occur in increments
- Requires Subsequent EIR Review and Permitting
- Data collection during initial 1 mgd demonstrates that a larger project is feasible.

FIGURE 2-2
RELATIONSHIP OF THE PROJECT COMPONENTS
EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

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FIGURE 2-3
PHASE 1 FACILITY LOCATIONS
EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

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FIGURE 2-4
PHASE-1 SITE LAYOUT
EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

Source: EBMUD

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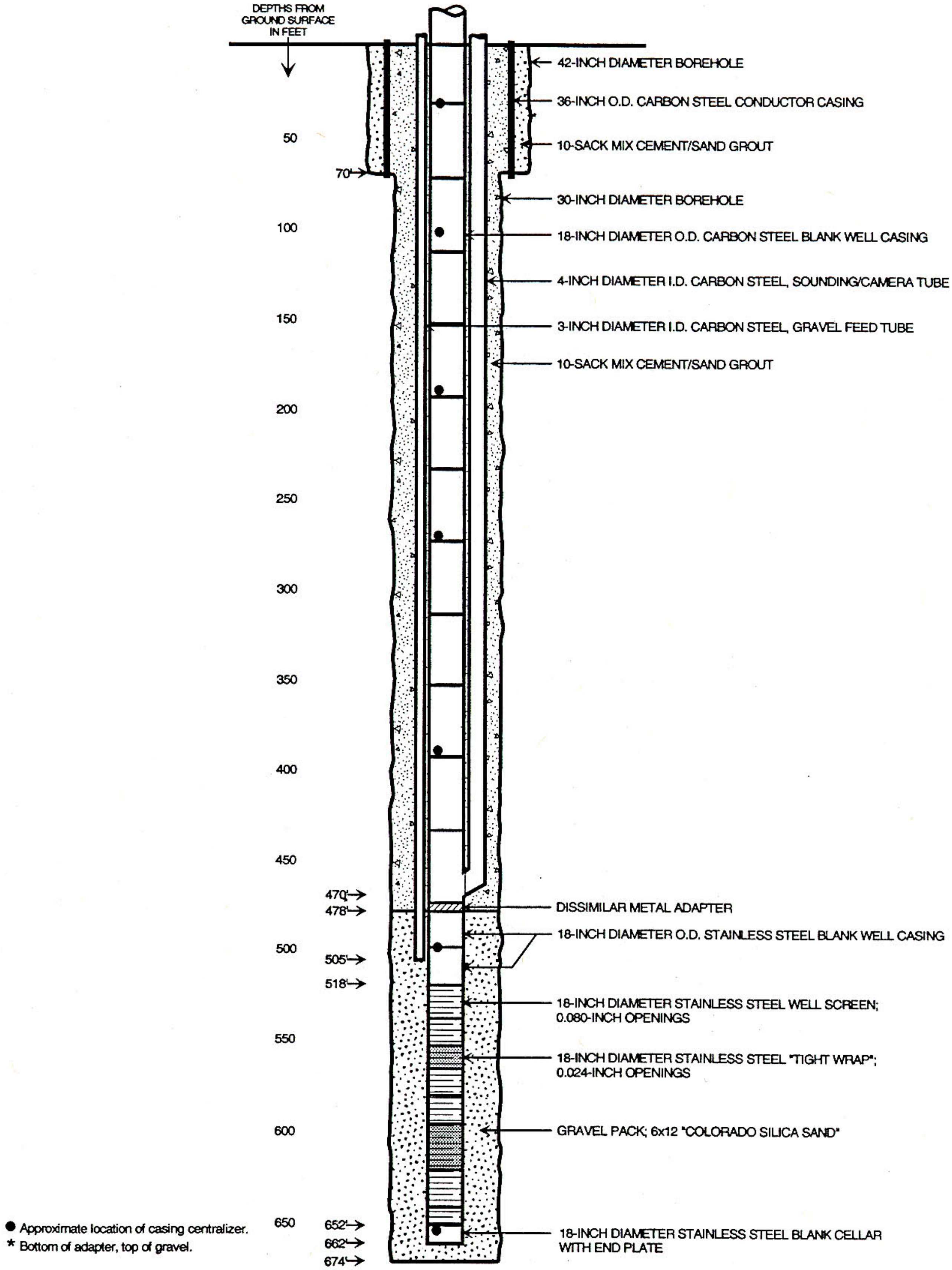

FIGURE 2-5
WELL DIAGRAM FOR BAYSIDE WELL NO. 1
EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

Source: Fugro 1998

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TABLE 2-1
Project Description Summary

Project Feature	Phase 1	Phase 2
Project Capacity	Average 1mgd extraction (short-term extraction up to 2 mgd rate)[a]; 1 mgd injection	2 to 10 mgd
Source of Injection Water	Several sources, including local runoff and conserved Mokelumne River water	Several sources, including local runoff and conserved Mokelumne River water
Number of Wells	One existing	Up to four additional
Well Locations	Adjacent to Oro Loma Wastewater Treatment Plant site	Industrial zone, westerly end of westerly Grant Avenue, or venues within a broader area including San Lorenzo, San Leandro, and southern part of Oakland
Treatment after Extraction	At-the-wellhead chloramination, pH control, and fluoridation; iron and manganese removal as needed	Not currently identified
Treatment Plant Location	Treatment at well site	Well sites or centralized treatment plant; location not known
Pipeline Alignment	Connection to existing 12-inch-diameter main in Grant Avenue; approximately 500 feet	Unknown but in the vicinity of well locations
Treatment Prior to Discharge	Settling followed by dechlorination	Not currently identified
Discharge	Filter backwash and well backflush via storm drain system and sanitary sewer, respectively	Not currently known
Operational Parameters	Drought Supply – May initiate operation when October reservoir storage is projected to decline below 500,000 AF	Drought Supply – May initiate operation when October reservoir storage is projected to decline below 500,000 AF
Alternatives	- No Project Alternative - Increased Conservation - Increased Reclamation - Regional Desalination - Groundwater Storage in East Contra Costa County	- No Project Alternative - Increased Conservation - Increased Reclamation - Regional Desalination - Groundwater Storage in East Contra Costa County
Monitoring	Ongoing monitoring of ground surface elevation change (subsidence), water quality, groundwater levels, and model verification	Not currently known; anticipated to be similar to Phase 1; possibly expanded version of Phase 1 monitoring

a Short-term extraction rate could be up to 2 mgd; however, the annual average extraction would not exceed 1 mgd.

The project monitoring well network is intended to provide regional water level data from aquifers of varying depths in the SEBPB and NCGWB. To monitor the aquifers at varying depths, clusters of wells are to be installed as needed. The network consists of local and regional wells screened in shallow, intermediate, and deep aquifers. The local wells included in monitoring networks are the existing OW2, OW4, OW5, and Wells E and S, and the new or enhanced Davis Street Well, Farmhouse Well, and Hayward Wells D and Q (Figure 2-6). New monitoring wells for shallow and intermediate depth are planned at the Farmhouse Well site and new shallow and deep wells are planned to be drilled as shown on Figure 2-6. In addition, the network would include private and public wells both in the SEBPB and NCGWB. The available water level and water quality monitoring data from ACWD and City of Hayward would also be incorporated into the monitoring program.

Initially, while the quality of the extracted water is tested and the appropriate type of wellhead treatment is brought on-line, extracted groundwater would be pumped to the existing storm drain, located on Grant Avenue adjacent to the project site. Once treatment is in place, the extracted water would be available for use if drought conditions arise during the test period. If there is no drought during the test period, the water would continue to be pumped to the storm drains. Extraction would be limited to 1,121 AF per year (average of 1 mgd).

Sustained Operation

During wet years, EBMUD would inject treated potable drinking water from the distribution system at a rate of 1 mgd for the portion of the water year during which water is available. Conditions under which injection would take place include 1) active flood releases on the Mokelumne River, and 2) sufficient runoff in the local watershed. Historical hydrological data suggest that after sustained operation begins, water would be available for injection approximately 40 percent of the time. During dry years, EBMUD would recover both injected water and native groundwater by operating Bayside Well No. 1 in extraction mode during warm-weather months. The pumps would be operated at a 2-mgd extraction rate during this part-year period to maximize warm-weather yield and well efficiency; however, the well would maintain an annual yield of 1 mgd (1,121 AF per year). Sustained operation would also include regular collection and evaluation of monitoring data on both injection and extraction operations. The facility would be operated from one of the District's operation control centers.

EBMUD would divert water for aquifer recharge from any of several sources, including local watershed runoff and conserved Mokelumne River water. Sections 1.4.4 and 1.4.5 of this DEIR fully describe these sources.

Maintenance

When the well system is not in use, standard maintenance activities would include periodic backflushing and cleaning. Rehabilitation would remove accumulated debris that cannot be dislodged by backflushing. Rehabilitation and cleaning techniques may include mechanical brushing or chemical treatment.

2.4.1.3 Phase 1 Monitoring Program

A key component of Phase 1 would be extensive monitoring programs to measure changes in water levels, water quality, and ground level elevations (subsidence). This work would also provide detailed local field measurements from Phase 1's actual wellfield operations.

Subsidence Monitoring

High-resolution extensometers can detect an increment of permanent (inelastic) subsidence large enough to be definitive but small and restricted enough in area as to have an inconsequential effect at the land surface. Therefore, an extensometer system would be installed and operated as part of the management plan for the project.

The extensometer cluster would be installed with measuring points at depths of about 300 feet, 500 feet, 650 feet, and 1,000 feet. This spacing allows identification of subsidence within distinct units, possibly including: 1) the aquitard below the Deep Aquifer (depth range 650 to 1,000 feet below ground surface [bgs]), 2) the Deep Aquifer system itself (depth range 500 to 650 feet bgs), 3) the aquitards overlying the Deep Aquifer (300 to 500 feet bgs), and 4) the land surface (to 300 feet bgs).

For proper evaluation of subsidence, water-level data must be collected adjacent to and in concert with extensometer data. A number of monitoring wells installed as part of the pilot study for this project would be used for the project monitoring program; however, multiple piezometers would also be required to accurately record stress at distinct depth intervals. Piezometers are small monitoring wells that are open to a very short section of the aquifer-aquitard system, typically containing only 5 to 10 feet of well screen versus the tens to hundreds of feet covered by standard wells. The extensometer-piezometer installation for this project would be placed near the existing Phase 1 Bayside Well No. 1. Water-level measurements would be collected through monitoring wells and piezometers; EBMUD would also rely on regional data collected by its own staff and other agencies.

After the extensometers and piezometers are installed, Bayside Well No. 1 can be pumped and associated water level and subsidence data collected. Water levels and extensometer readings would be collected electronically at intervals ranging from about 1 to 30 minutes. The more frequent readings are appropriate any time the pumping rate changes. Monitoring would occur throughout Phase 1 and would include several cycles of pumping.

For areal definition of subsidence, survey points would also be established in a grid-like pattern throughout the area. Monuments at these locations would be surveyed on a regular basis to measure any subsidence and recovery.

Regional Groundwater Level Monitoring

Regional groundwater level monitoring would provide groundwater basin information to update the regional groundwater model. EBMUD, in coordination with ACWD, would monitor water level responses in the SEBPB and the NCGWB during the initial start-up year of Phase 1 operation to monitor for water level changes that could affect ACWD operations. The monitoring would begin three months prior to operation of the project, continue throughout Phase 1 start-up operations, and for a minimum of three months following the completion of extraction and injection to confirm the accuracy of the regional groundwater modeling performed for the Proposed Project.

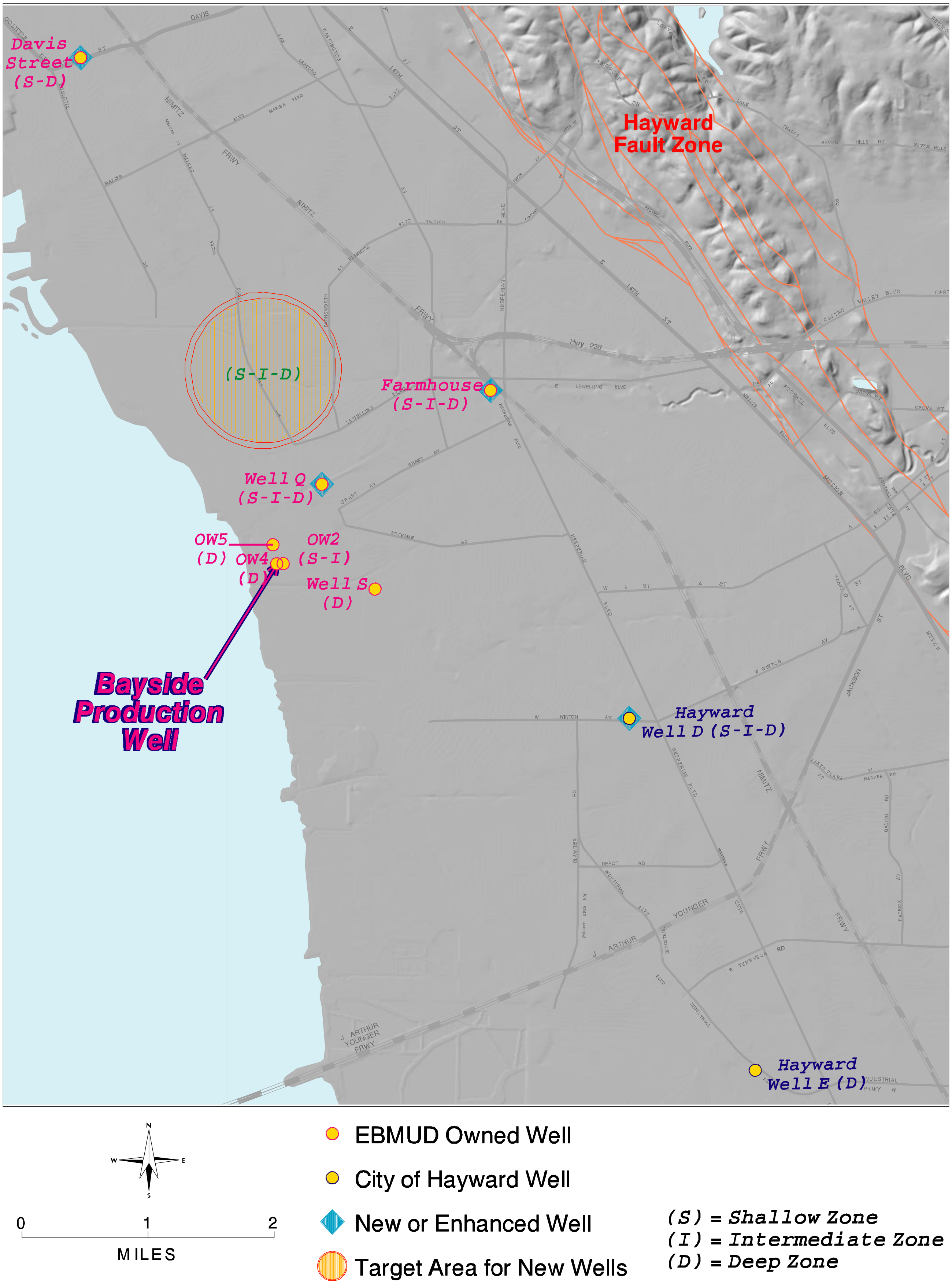

FIGURE 2-6
EBMUD PROPOSED WELL MONITORING NETWORK
EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

CH2MHILL

169710.26.ZZ•Fig 2-6 •1/26/05•ccc•SFO

A detailed monitoring plan specifying water level and water quality monitoring during Phase 1, including monitoring locations, frequency, and required accuracy, would be developed by EBMUD in consultation with local groundwater management agencies prior to initiation of Phase 1 operations.

Water Quality Monitoring
Water quality sampling and analysis would take place throughout the water production and treatment process to assure adherence to water-quality standards. Additionally, periodic samples would be collected from monitoring wells to track water quality in the groundwater basin.

Regional Groundwater Modeling
Collaboration with ACWD and City of Hayward.
Regional groundwater modeling work, including updates, review of model results, verification, and recalibration, impact analysis, and assessment of mitigation strategies, would be conducted in cooperation with ACWD and the City of Hayward. After substantial operation, the regional model would be run with an updated and expanded historical database. EBMUD would share acquired hydrologic input data and model results on an annual basis with ACWD and the City of Hayward.

Review of Model Results/Verification/Recalibration.
Model results would be compared with actual water levels to verify the model and identify areas of uncertainty. This review would be a basis for consideration of additional monitoring wells, if needed. The model would also be used to confirm the effects of project operations on groundwater conditions in the SEBPB and NCGWB. At a minimum, EBMUD would recalibrate the model after Phase 1 start up operations have been completed, but before implementation of Phase 2. The recalibrated model would be used to design a Phase 2 pumping and injection program to minimize effects on water level changes in the SEBPB and NCGWB during long-term operation at higher pumping rates.

2.4.2 Phase 2 Project Description

The subsections below give an overview of the possible future Phase 2 expansion of the project. The area in which Phase 2 facilities may be located is shown on Figure 2-1**.**

2.4.2.1 Decision to Initiate Phase 2 Environmental Review

At this time, EBMUD does not know whether it will pursue Phase 2 or, if it does pursue it, exactly what Phase 2 facilities would be necessary; where those facilities would be located; or what the ultimate size of those facilities would be, other than somewhere in the range of 2-10 mgd average annual capacity. EBMUD plans to use information gained from actual operation of Phase 1 to help inform its future determinations on whether and how to proceed with Phase 2. Selection of technology for treatment facilities, and design and location of treatment (if needed), injection/extraction wells, and delivery facilities for Phase 2 would not be determined until the District confirms that it is feasible to expand the project's capacity (to between 2 and 10 mgd. As a result, the description of facilities and the impact analysis for Phase 2 in this DEIR are qualitative only. If in the future EBMUD determines that Phase 2 facilities are feasible and desirable, it will prepare a subsequent EIR on Phase 2 at that time.

If EBMUD decides that Phase 2 is feasible and desirable, it would be implemented consistent with the overall project objectives stated in Section 2.3 above. Additionally, the following conditions would apply to the future expansion:

- Expansion could occur in one or several increments of capacity increase,
- Expansion would require CEQA review and permitting, and
- Data collection and modeling during operation of Phase 1 must demonstrate that a larger project is feasible.

2.4.2.2 Phase 2 Facilities

Wells. Up to four additional production wells would be needed to attain 10 mgd extraction capacity. If EBMUD does proceed with Phase 2, well locations would be determined based on the monitoring results of Phase 1. Wells might be sited over a large geographic area to minimize the potential for groundwater and subsidence impacts.

Treatment Facility(ies). The treatment technology and location/size of treatment facility for Phase 2 would depend on the location and distribution of extraction wells and water quality. If wells are clustered together, a central treatment facility may be practical. However, Phase 1 monitoring results may indicate that a broader geographic distribution of wells would reduce potential groundwater and subsidence impacts. In that event, a centrally located treatment facility would not be feasible, and wellhead treatment at each well may be more practical.

Transmission Pipeline(s). Implementation of Phase 2 may require a new transmission pipeline to convey water from the wellfield to the EBMUD distribution system, depending on the geographic distribution of wells and the existing capacity of pipelines currently servicing the relevant locations.

2.4.2.3 Phase 2 Monitoring

The Phase 2 monitoring approach would be generally similar to that described for Phase 1, with more intensive concentration in areas of potential impact.

2.5 Phase 1 Project Construction

Although the major facility for Phase 1, Bayside Well No. 1, has already been developed, about 12 months would be required to complete Phase 1 construction. Activities would include site preparation, well rehabilitation, and installation of piping from Bayside Well No. 1 to the Grant Avenue pipeline along with installation of valves, treatment systems, the extensometer cluster, monitoring wells, instrumentation and controls, fencing, security, and landscaping. Most construction activities would occur within the existing Bayside Well No. 1 site and at the extensometer field shown on Figure 2-3.

Because the groundwater level at the site is expected to be high, dewatering would likely be required for site grading and paving, pile driving for the foundation, construction of the treatment facility building and tanks, and the utility and drainage system. The total construction area is approximately 0.5 acres, and the amount of material to be excavated is approximately 750 cubic yards.

The majority of construction would take place during normal work hours, with occasional weekend and evening work. However, the extensometer cluster would require 24-hour drilling operations. Offsite construction would include a short, 12-inch-diameter pipeline connection from Bayside Well No. 1 to the 12-inch-diameter distribution line in Grant Avenue, a storm drain pipeline to the existing catch basin on Grant Avenue, and installation of the extensometer cluster on a portion of EBMUD land northeast of the well site.

2.6 Project Alternatives

CEQA Guidelines Section 15126.6 requires that EIRs evaluate a range of reasonable alternatives to a project, or to the location of a project, that would feasibly attain most of the basic project objectives and avoid or lessen significant project impacts. Section 7.0 of this DEIR describes the extensive alternatives analysis conducted for the Bayside Groundwater Project. EBMUD established evaluation criteria based on the project objectives stated in Section 2.3 above. These criteria were applied to an initial list of 23 potential alternatives. That analysis resulted in the identification of 3 alternatives that could meet the Bayside Project objectives:

- Increased conservation and reclamation,
- Regional desalination, and
- East Contra Costa County groundwater development.

Section 7.0 compares these alternatives and summarizes the alternatives that were considered for evaluation in this DEIR but eliminated during the alternatives analysis. Section 7.0 also describes the “No Project” Alternative.

2.7 Project Schedule and Approvals

The subsections below outline the proposed schedule and permits required for Phase 1.

2.7.1 Schedule

The following schedule milestones are effective at the time this DEIR is released for public comment. Dates following the release of the DEIR for public comment are subject to change.

- Opening of 45-day public comment period for DEIR, March 2005
- Closing of public comment period, April 2005
- Certification of EIR and approval of Phase 1 by District Board of Directors, August 2005
- Completion of final design, March 2006
- Award of construction contract, October 2006
- Completion of construction, October 2007
- Duration of startup operation, September 2007 to September 2008
- Project in service, October 2008

2.7.2 Permit Requirements

In accordance with CEQA Guidelines Section 15124(d)(1)(B), Table 2-2 describes the regulatory agency permits that may be required for Phase 1.

TABLE 2-2
Required Permits for Phase 1

Permit	Administering Agency	Description
Federal Jurisdiction		
Safe Drinking Water Act Section 1421 Underground Injection Permit	U.S. Environmental Protection Agency	Addresses quality of injected water and flow rates.
State Jurisdiction		
Public Water System Permit	California Department of Health Services	Addresses approval of a new potable water source added to a public water system.
Drinking Water Source Assessment and Protection Program compliance	California Department of Health Services	Addresses area around a drinking water source through which contaminants might move and reach the drinking water supply. Also includes an inventory of activities that might lead to the release of microbiological or chemical contaminants within the delineated area.
Local Jurisdiction		
Alameda County Clean Water Program – National Pollutant Discharge Elimination System (NPDES) compliance review	Alameda County Department of Public Works	Addresses discharge of filter backwash and well backflush water to storm drain system.
Sanitary Sewer Discharge Permit	OLSD	Addresses filter backwash discharge to the sanitary sewer.
Encroachment permit	Alameda County Department of Public Works	Addresses connection to distribution pipeline within public street right-of-way.

If EBMUD decides to proceed with Phase 2 in the future, additional permits would be required. Once facility locations are determined and Phase 2 facilities are defined, the agencies with jurisdiction over the various facilities in Phase 2 can be identified. The subsequent EIR that would be prepared for Phase 2 would include a complete list of required permits.

3.0 Phase 1 Environmental Setting, Impacts, and Mitigation Measures

Section 3.0 describes the environmental setting and analyzes the potential impacts and mitigation measures for Phase 1 of the Proposed Project. The environmental setting and analysis of potential impacts of Phase 2, to the extent that they are now known, are addressed in Section 4.0.

3.1 Phase 1 Groundwater Hydrology and Quality

This section describes potential impacts and mitigation for groundwater hydrology and quality related to Phase 1 of the project.

3.1.1 Approach to Analysis

Phase 1 of the project is located in the Southeast Bay Plain Groundwater Basin (SEBPB). The Niles Cone Groundwater Basin (NCGWB) is located immediately to the south. This section evaluates the hydrogeology of both basins to assess: 1) potential impacts related to changing water levels; and 2) groundwater quality impacts related to withdrawal and injection of groundwater during project operation.

A numeric groundwater flow model for the SEBPB and NCGWB was developed cooperatively by EBMUD, Alameda County Water District (ACWD) and the City of Hayward (WRIME 2004). The model, the Niles Cone and South East Bay Plain Integrated Groundwater and Surface Water Model (NEBIGSM), is used to simulate operations of the project and to evaluate potential project impacts on groundwater levels in this area. The model simulates groundwater flow in the aquifers and across the aquitards[1] and provides an estimate of the water budget[2] of the system. Changes in groundwater quality in the Deep Aquifer and saltwater intrusion[3] affecting the aquifers of the NCGWB are evaluated using data from the flow model.

3.1.2 Setting

The subsections below describe the elements of the project setting related to groundwater hydrology and quality.

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[1] An aquifer is a body of permeable rock or sediments saturated with water and through which groundwater moves. An aquitard or aquiclude is a layer of geologic material which generally retards or prevents the movement of groundwater and forms a vertical boundary of an aquifer.

[2] A water budget is the general balance of inflow (recharge), outflow (discharge) and storage in a groundwater system.

[3] Saltwater or seawater intrusion is the increase in salinity of groundwater due to the migration of saltwater caused by groundwater pumping. It can occur in coastal aquifers, such as the SEBPGB or the NCGWB, where freshwater in the groundwater basin occurs in hydraulic contact with a saltwater body such as San Francisco Bay.

3.1.2.1 Regional Geohydrology

Both the SEBPB and the NCGWB have been a source of water supply to residents of the East Bay for over 100 years. The SEBPB extends along the East Bay foothills to the Bay approximately from Richmond to Hayward. The NCGWB begins south of the SEBPB, and extends from about Hayward to Milpitas. The general location of the two groundwater basins is shown in Figure 3.1-1.

Historically, groundwater investigations have focused on one basin or the other, and the relationship between the two basins has not been well understood. However, field testing and computer modeling investigations have evaluated the relationship of these basins and the potential to affect water levels in one basin as a result of pumping from the other. Figure 3.1-2 shows a generalized geologic cross-section of the two basins and indicates the relationship of the various layers of aquifers (water-bearing sediments) within the basins.

Niles Cone Groundwater Basin

The NCGWB is hydraulically separated into two sub-basins by the Hayward Fault. Only the sub-basin located to the west of the Hayward Fault, referred to herein as “Below the Hayward Fault,” is hydraulically connected to the SEBPB and would be potentially affected by implementation of the project.

ACWD was formed in 1914 with the original purpose of protecting groundwater supplies in the NCGWB from development by outside interests. Subsequently, ACWD became the sole operator of the water distribution systems (now one system) serving Fremont, Newark, and Union City. Over the years, ACWD has actively managed and protected the NCGWB through a number of programs, such as artificial recharge/conjunctive use, prevention and reversal of sea water intrusion (described in detail below), administration and enforcement of local well ordinances, and local regulatory oversight of sites with contaminated soil and/or groundwater.

Hydrostratigraphic Units

The Below the Hayward Fault sub-basin of the NCGWB is comprised of three primary regional aquifer units (CH2M HILL 2005):

- The *Newark Aquifer* is the uppermost unit; it consists of a permeable gravel layer between about 40 and 140 feet below ground surface (bgs) except in the Forebay Area (Figure 3.1-1) where it begins at the surface. The thickness of the Newark Aquifer ranges from more than 100 feet at the Hayward Fault to less than 20 feet at certain areas at the western edge of the basin. Over most of the basin, this aquifer is overlain by a thick layer of silt and clay called the Newark Aquiclude.

- The *Centerville and Fremont Aquifers* are typically present within the depth intervals of 180 to 250 and 250 to 390 feet bgs, respectively. In the NCGWB, these aquifers are typically considered to be one unit because of the pervasiveness of the interconnections between these two units throughout the sub-basin.

- The *Deep Aquifer* is present at depths greater than 400 feet bgs and is separated from the Centerville and Fremont Aquifers by a confining layer of fine sediments.

ACWD pumps most of its groundwater from the Newark, Centerville and Fremont Aquifers.

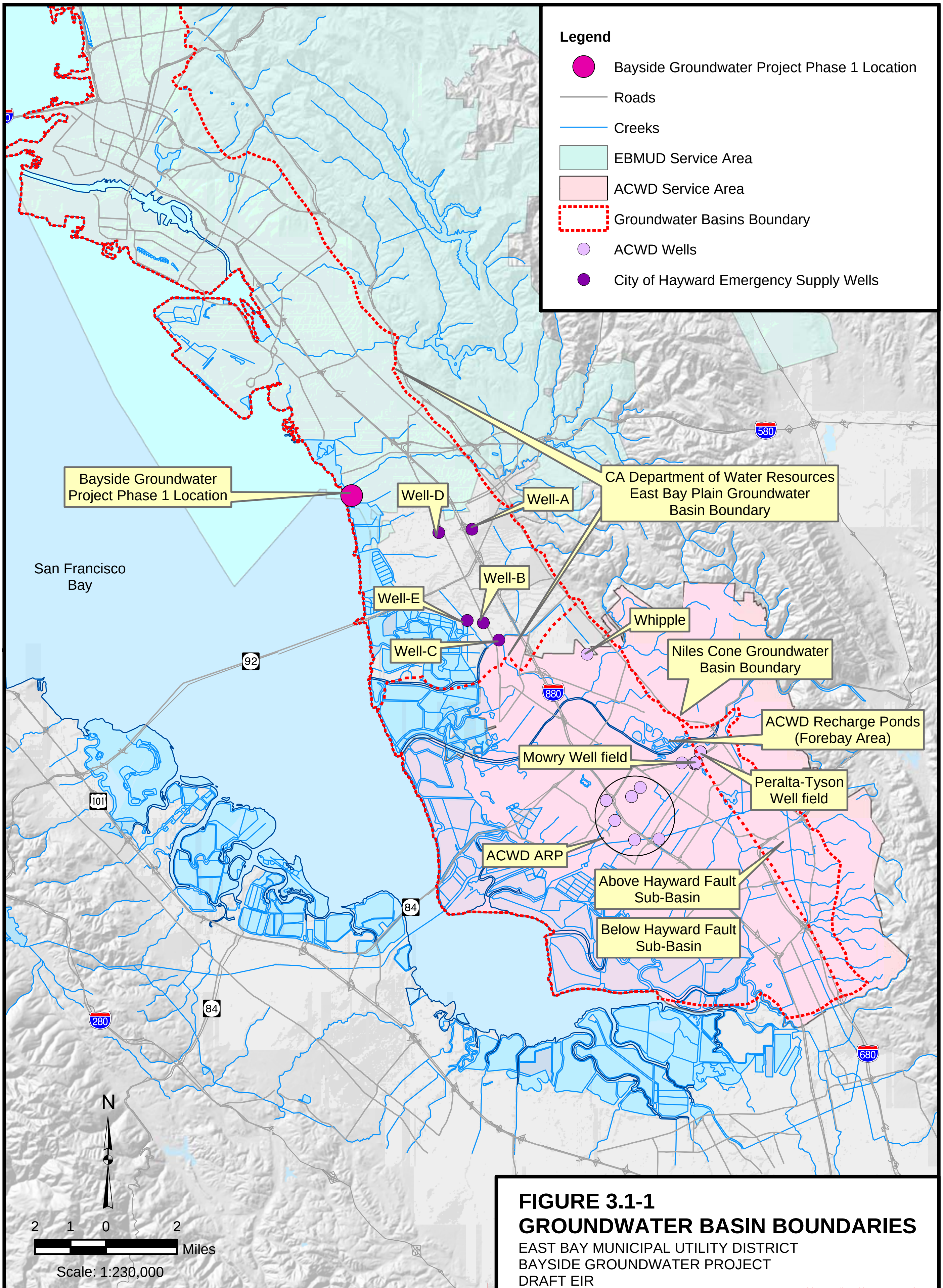

FIGURE 3.1-1
GROUNDWATER BASIN BOUNDARIES
EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

CH2MHILL

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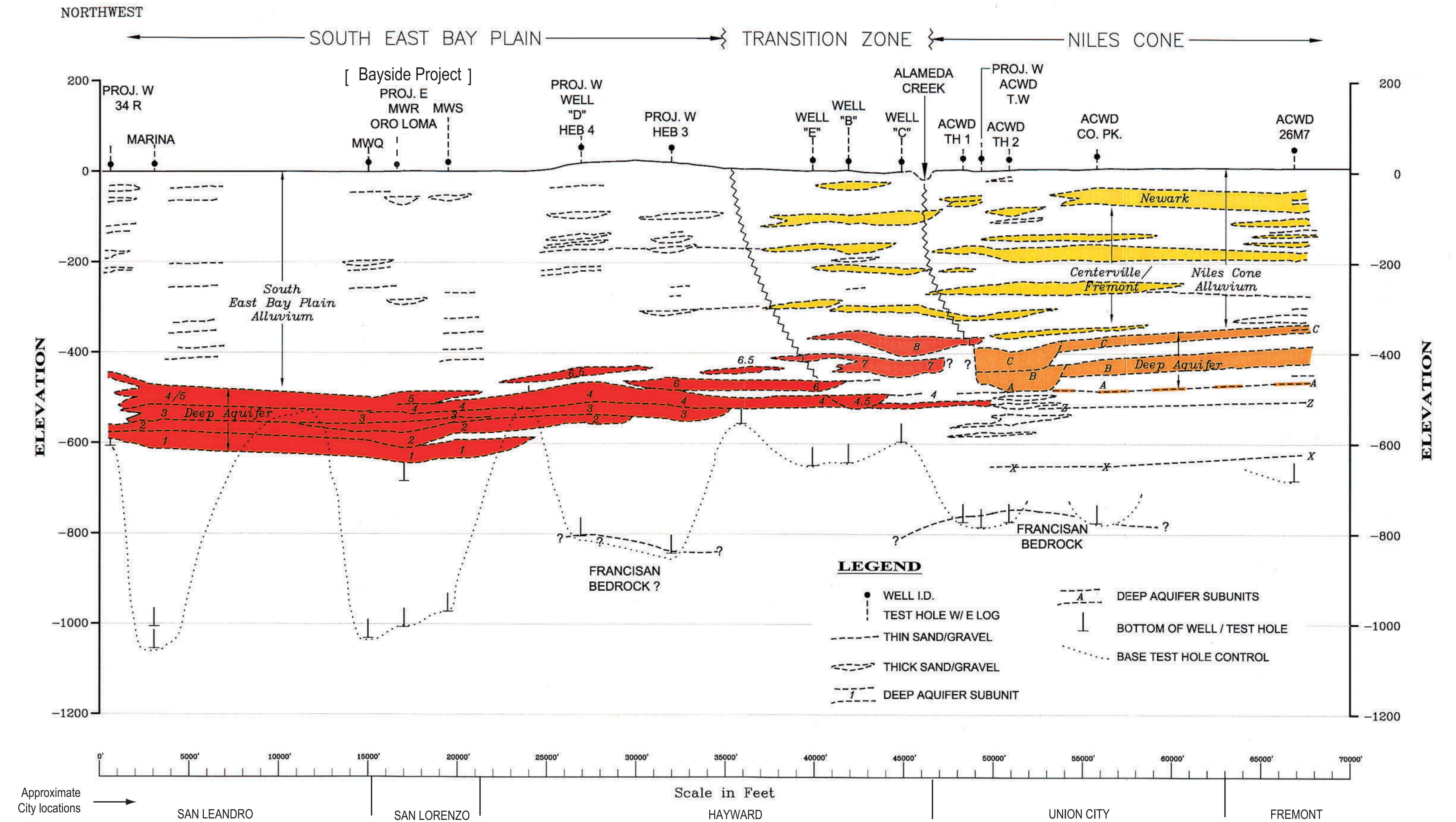


Scale in Feet
0' 1250' 2500' 5000'
Vertical Exag. 25X

Source: Luhdorff & Scalmanini 2002.

FIGURE 3.1-2
GENERALIZED GEOLOGIC CROSS-SECTION OF SEBP,B-&NCGWB
EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

CH2MHILL

169710.26.ZZ•Fig 3.1-2 Generalized Geologic Cross Section_11/11/04_ccc•SFO

In most areas, these aquifers are separated from each other by layers of clay which impede the movement of water vertically between the aquifers. An exception to this is the Forebay Area (Figure 3.1-1) where the layers of clay separating the aquifers become thinner and are discontinuous, allowing for a hydraulic connection between all three aquifers. ACWD has an active program to seal abandoned wells that may provide vertical interconnections, but it is likely some abandoned wells may never be found.

The NCGWB has a limited storage capacity. In general, operating groundwater levels in the Newark Aquifer in the Forebay Area are maintained between 3 feet above mean sea level (msl) and 20 feet above msl, which provides an operational storage capacity of approximately 17,000 acre-feet (AF) within the Below the Hayward Fault sub-basin of the NCGWB (ACWD 2001). Groundwater levels above 20 feet msl result in "overflow" losses to San Francisco Bay through discharges to Alameda Creek and/or other mechanisms. Groundwater levels lower than 3 feet above msl may result in a reversal of groundwater gradients and could lead to saltwater intrusion of the Newark Aquifer (discussed below). During normal to wet years, ACWD operates the NCGWB such that the head of the Newark Aquifer in the Forebay ranges from 10 feet above sea level to 20 feet above sea level. This higher operating range 1) helps to ensure continuation of progress toward expelling of chlorides to San Francisco Bay via subsurface outflow, and 2) reduces the potential or duration that the groundwater basin would be operated near or below minimum operating levels should the ensuing year(s) be dry.

South East Bay Plain Basin

The SEBPB, shown on Figure 3.1-1, is bounded to the east by the Hayward Fault and extends beneath San Francisco Bay to the west. Because the precise location of the western boundary under the Bay is not known, Figure 3.1-1 shows this boundary at the edge of the Bay, consistent with how the California Department of Water Resources depicts this boundary. The SEBPB thins to the north and becomes an insignificant source of groundwater near Berkeley. The southern boundary is in the City of Hayward, approximately near the San Mateo Bridge.

Hydrostratigraphic Units

The SEBPB is comprised of four main aquifer systems. Although only the Deep Aquifer, described below, is connected with the NCGWB, the units are named for their equivalent NCGWB units. The aquifer systems include (CH2MHILL 2000):

- The *Newark Aquifer equivalent* is present throughout the study area at approximately 30 to 130 feet bgs. Aquifers of limited extent occur at depths of less than 50 feet in this unit; they comprise a water table[4] aquifer system with relatively high vertical resistance to flow. This unit is separated from the underlying aquifers by an aquitard comprised of Old Bay Mud (also termed Yerba Buena Mud), a relatively homogenous estuarine mud. The aquitard is typically about 50 feet thick, but pinches out to the east towards the Hayward Fault.

- The *Centerville Aquifer equivalent* includes the upper marine portion of the Alameda Formation, which is comprised of estuarine muds separated by alluvial fan deposits. It is present at depths of about 130 to 220 feet bgs. In the project area, the Centerville Aquifer

[4] A water table is the upper surface of the saturated zone of groundwater which is exposed to atmospheric conditions.

equivalent consists of individual gravel and sand lenses varying in thickness from 5 to 60 feet. Groundwater in this aquifer occurs under confined[5] conditions.

- The *Fremont Aquifer equivalent* includes the lower marine portion of the Alameda Formation. It occurs between 250 and 375 feet bgs and is separated from the Centerville Aquifer equivalent by a thick aquitard. Groundwater in this aquifer occurs under confined conditions.
- The *Deep Aquifer* includes the upper 100 feet of the continental portion of the Alameda Formation and consists of alluvial fan deposits interfingered with lake, swamp, river channel, and floodplain deposits. The Deep Aquifer is present at depths greater than 400 feet bgs. This is the aquifer to be used for injection and extraction of water during operation of the project. Geophysical logs indicate that the aquifer is thickest in the southern portion of the study area, and thins and feathers out to the north; it appears that the unit is not substantially productive north of San Leandro. Based on lithologic logs from the San Mateo Bridge, the aquifer is believed to extend toward the middle of the Bay and interfinger with alluvial deposits shed from the opposite side of the Bay. Fine-grained clays and silts exist below the Deep Aquifer.

Within the SEBPB, the Deep Aquifer is believed to be the highest yielding and most continuous aquifer unit. The shallower units have been characterized as far less productive and continuous in comparison to their counterparts in the NCGWB.

Correlation of Aquifers and Transition Zone

A cross-section between the NCGWB and SEBPB is presented in Figure 3.1-2. The position and sequence of the materials comprising the Newark, Fremont and Centerville equivalent aquifers in the SEBPB correspond to the units in the NCGWB by the period of time the geologic deposits occurred, implying that they were deposited in the same time period.

The bottom of the Deep Aquifer in the SEBPB is considered to be approximately 100 to 150 feet deeper than the NCGWB (Luhdorff & Scalmanini 2002). The precise stratigraphic and structural relationships of the transition zone are not well understood. However, the Deep Aquifers of the SEBPB and the NCGWB appear to converge in a transition zone between the City of Hayward emergency supply wells C and E. Testing conducted by EBMUD, ACWD, and the City of Hayward to evaluate the hydrologic connection between the SEBPB and NCGWB (EBMUD 2003) indicated that the Deep Aquifers of both basins are hydraulically connected, although they do not act as one continuous unit.

Water Budget

A water budget is an accounting of the principle sources of basin recharge and discharge. A net recharge indicates rising basin water levels, while a net discharge indicates falling water levels. The water budget for the SEBPB, as simulated in the IGSM model (WRIME 2004), is presented in Figure 3.1-3. In summary, recharge components consist of rainfall infiltration, stream seepage, agriculture return flow, pipe leakage, and subsurface inflow to the Deep Aquifer from the NCGWB. Discharge components consist of pumpage, subsurface discharge, and evapotranspiration. Recharge to the basin was estimated to average about 8,400 AF per year in the mid-1990s, and discharge was estimated to average about 7,100 AF

[5] A confined aquifer is overlain by an aquiclude and is not directly exposed to atmospheric conditions.

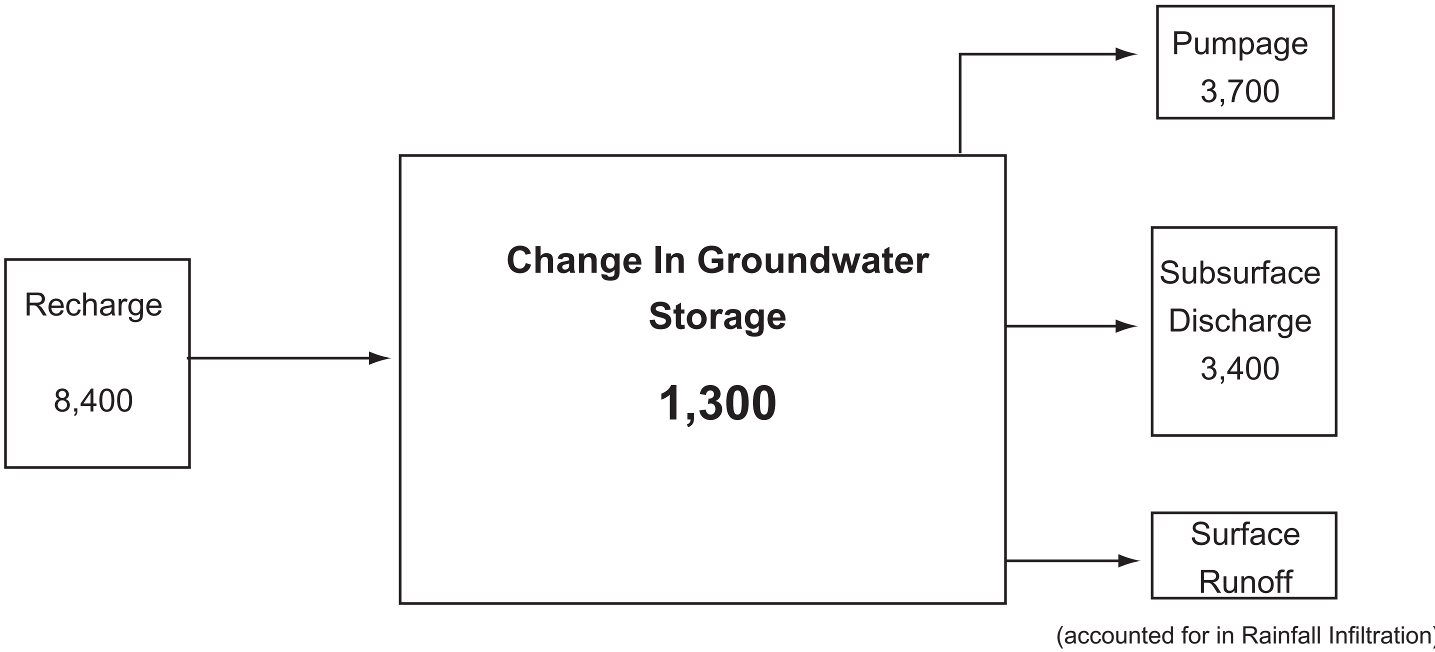


FIGURE 3.1-3
WATER BALANCE DIAGRAM
EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

Note: All values are in acre-feet/year

per year. Total available storage in the East Bay Plain Basin (extending north to San Pablo Bay) is estimated to be 80,000 AF (CA DWR 2004). This water balance results in net recharge of 1,300 AF (Figure 3.1-3), which is reflected in rising water levels in the Deep Aquifer. Historic overpumping and subsequent decline in water levels may have resulted in greater recharge from groundwater movement into the basin from the NCGWB (USGS 2003).

3.1.2.2 Groundwater Movement and Quality

Groundwater Movement

SEBPB

Currently, groundwater in the shallow units of the SEBPB generally flows from east to west, from the Hayward Fault towards San Francisco Bay (CH2M HILL 2000). Groundwater level contours for the Newark aquifer equivalent (Figure 3.1-4) indicate that shallow zone aquifers have an average horizontal gradient of about 0.002. Groundwater level contours for the Centerville and Fremont aquifer equivalents (Figure 3.1-5) indicate that the average horizontal gradient in these units is also about 0.002. Water-level data for the deep zone are sparse, although groundwater level contours for this zone (Figure 3.1-6) indicate a horizontal gradient of about 0.001. The deep zone water levels also indicate more of a northerly component of flow than the shallow aquifers, possibly indicating recharge from the NCGWB area.

Water level maps indicate that vertical downward gradients (i.e., the head in upper unit is higher than that of the adjacent lower unit) are present throughout the SEBPB where the Old Bay Mud is present. Vertical gradients are approximately 0.02 near the Bay margin (from both Newark Aquifer equivalent to Centerville and Fremont Aquifer equivalents, and from these units to the Deep Aquifer), and are very small near the foothills where the Old Bay Mud pinches out.

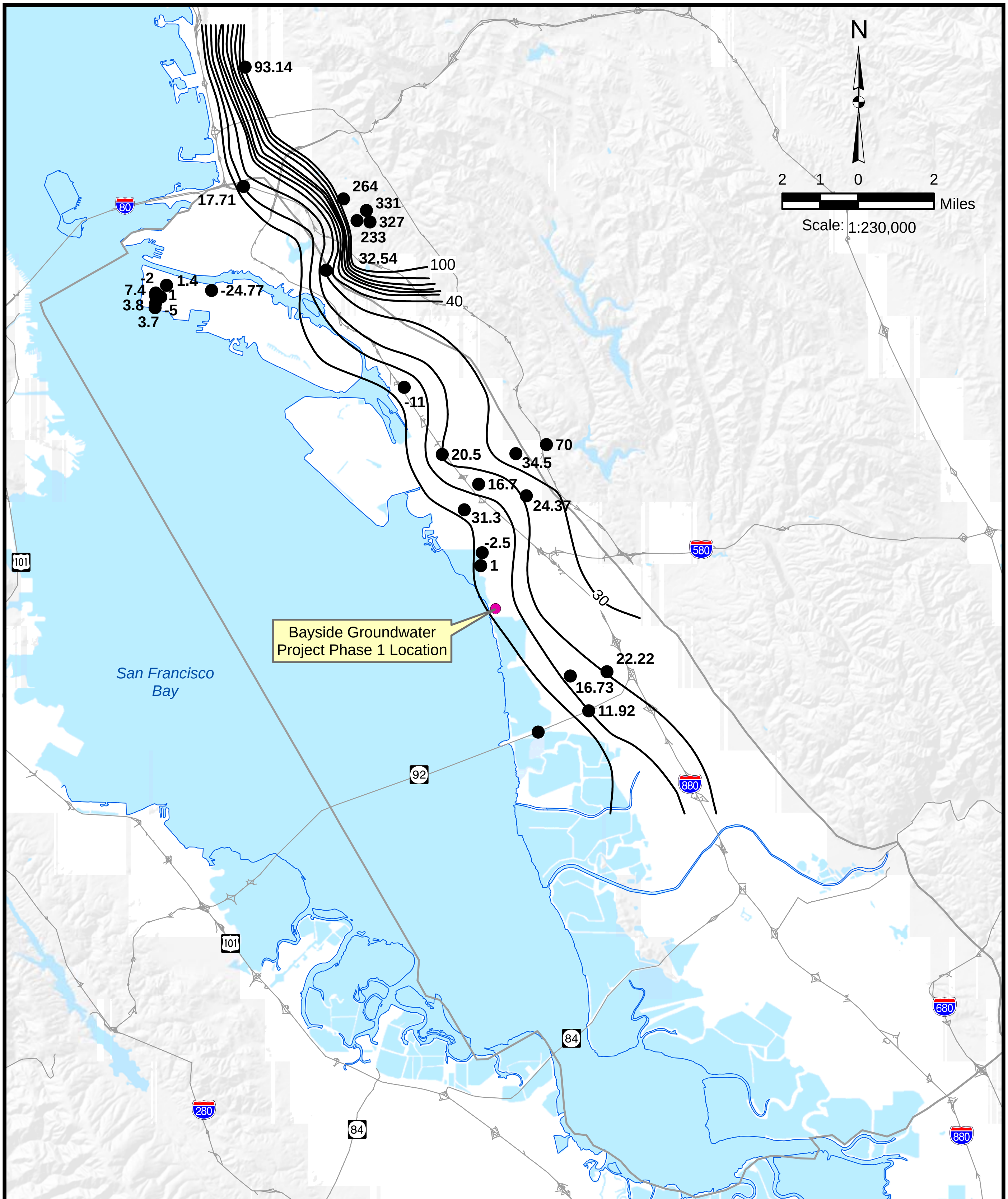
NCGWB

Groundwater levels in the regional aquifers of the NCGWB are significantly influenced by ACWD pumping and artificial recharge operations. ACWD aims to maintain groundwater levels within prescribed ranges in order to conserve supplies, to prevent new sea water intrusion, and to clean up areas that remain brackish from previous years of sea water intrusion. Groundwater flow in the NCGWB is generally east to west in the Newark Aquifer, from the artificial recharge ponds towards the San Francisco Bay.

Vertical groundwater flow in the NCGWB is generally downward, from the Newark Aquifer towards the Deep Aquifer. Downward flow is greatest near the Forebay due to coarse sediments and decreases towards the west as the sediments get more fine-grained. Vertical flow in the west is also influenced by the boundary effect of the San Francisco Bay, which may at certain times cause upward gradients.

Historic Water Levels

Although rough estimates of municipal pumping are available from the late 1800s until 1930, water level data are only available from the 1950s to the present time. Results of model runs simulating historical pumping suggest that water levels in the 1960s likely represent the historical low (CH2M HILL 2005). Water levels were a minimum of about –90 to –110 feet MSL near the project site at this time.



Source: CH2M HILL 2000

FIGURE 3.1-4
GROUNDWATER CONTOURS (FT MSL), NEWARK AND EQUIVALENT AQUIFER (1990-1998 AVERAGE)

EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
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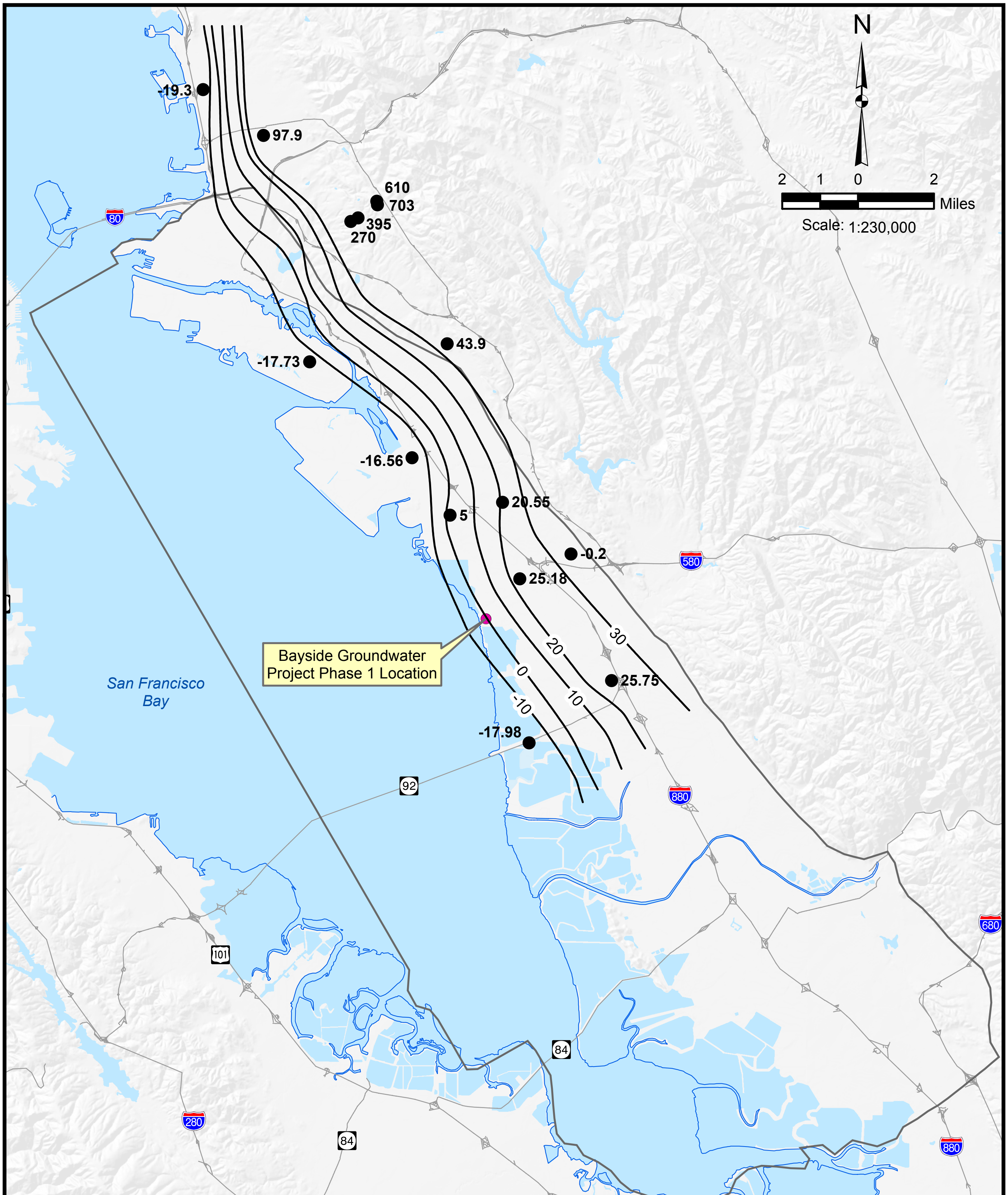

FIGURE 3.1-5
GROUNDWATER CONTOURS (FT MSL), CENTERVILLE, FREMONT AND EQUIVALENT AQUIFER (1990-1998 AVERAGE)
EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

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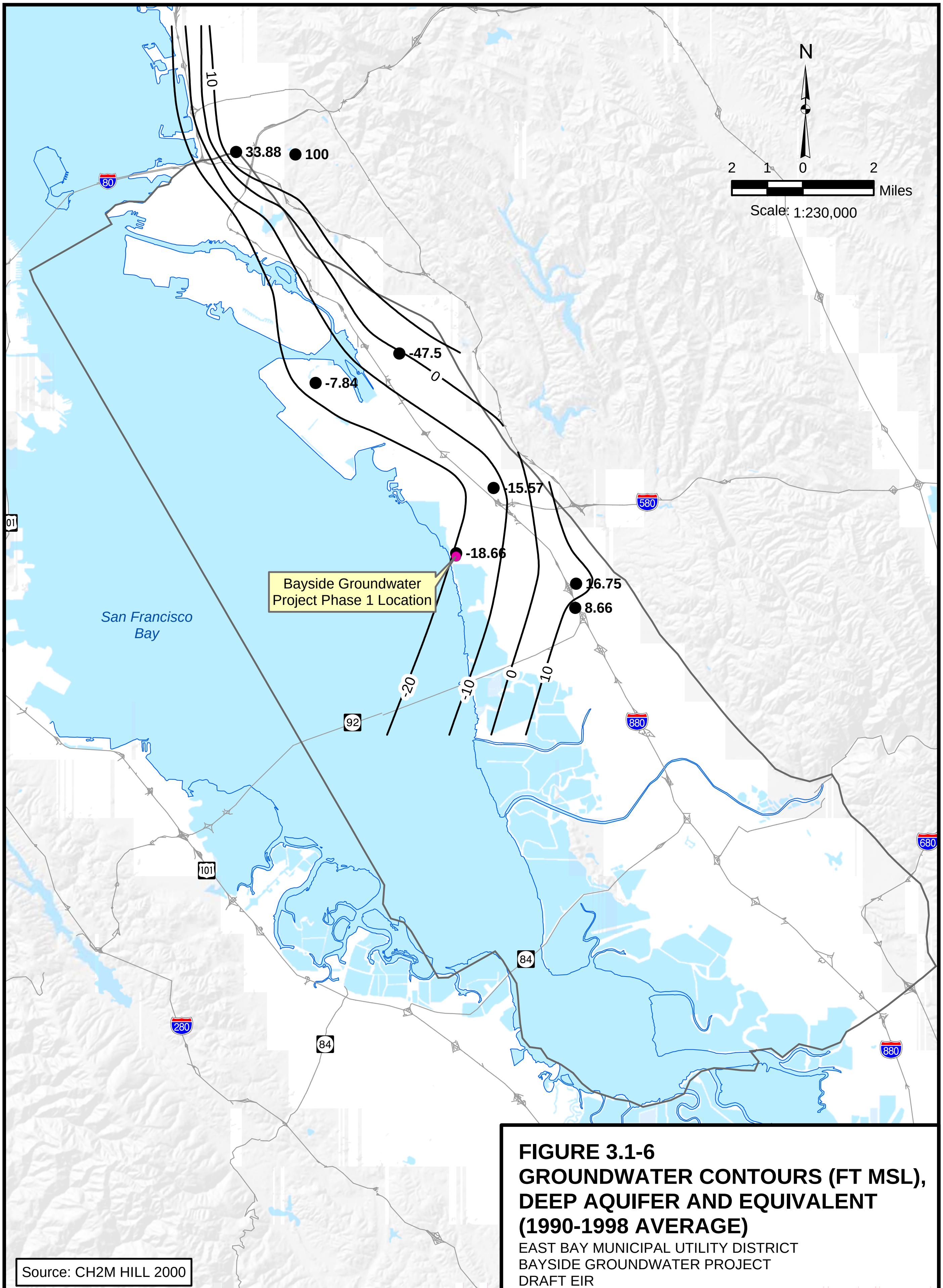

FIGURE 3.1-6
GROUNDWATER CONTOURS (FT MSL), DEEP AQUIFER AND EQUIVALENT (1990-1998 AVERAGE)

EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

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Available historical water level data for select SEBPB and NCGWB wells are presented in Figure 3.1-7. Hydrographs from both basins show similar trends and suggest that the two systems have responded to similar stresses over time and that the basins have some degree of hydraulic connection. Figure 3.1-7 shows the hydrographs of wells completed in the Centerville and Fremont Aquifer equivalents and Deep Aquifer in the SEBPB as well as the corresponding units in the NCGWB. The historic trends indicate a maximum drawdown of the system occurring in the early 1960s with gradual recovery to the present.

Groundwater Quality in the SEBPB

Information on groundwater quality is summarized from the *Regional Hydrogeologic Investigation of the South East Bay Plain* (CH2M HILL 2000). Groundwater of the Newark Aquifer equivalent, based on total depths less than 200 feet, is characterized by relatively high concentrations of total dissolved solids (TDS), chloride, nitrate, and sulfate, especially compared to deeper units, and is more susceptible to contamination from surface sources. Groundwater from some wells completed in this aquifer exceeds the maximum contaminant level (MCL) for nitrate and the secondary MCL for TDS, chloride, sulfate, iron, and manganese. Nitrate levels in groundwater are elevated in large parts of the San Leandro/San Lorenzo area. Iron concentrations in the Newark Aquifer equivalent are typically less than 0.05 parts per million (ppm). Groundwater from wells completed within the Centerville and Fremont Aquifer equivalents, based on total depths of 200 to 500 feet bgs, locally exceeded the secondary MCLs for TDS, chloride, iron, and manganese. High TDS values in at least some of these wells are probably related to shallow screen intervals. Iron and manganese data for this zone are sparse.

Wells completed within the Deep Aquifer, based on depths greater than 500 feet bgs, are located primarily in the southern portion of the study area. Groundwater from these wells is characterized by elevated concentrations of iron and manganese. Chloride, nitrate and sulfate concentrations are relatively low in this unit.

Sampling and analysis of wells screened in the Deep Aquifer near the project area showed that native groundwater meets all current primary (health-based) drinking water standards and, with the exception of manganese, all secondary (aesthetic) drinking water standards. Sampling from Bayside Well No. 1 has indicated levels of manganese at 129 parts per billion (EBMUD 2003), which exceeds the secondary drinking water standard of 50 parts per billion. High manganese content is common in groundwater and is removed through standard treatment methods.

Saltwater Intrusion

Saltwater or seawater intrusion is the increase in salinity of groundwater due to the migration of saltwater into an aquifer caused by groundwater pumping. Saltwater in shallow aquifers underlying the SEBPB has been evident since the late 1800s and was extensively studied in the early 1960s (USGS 2003).

Saltwater intrusion was first noted in the Newark Aquifer of the NCGWB in the 1920s after prolonged pumping in the aquifer caused groundwater levels to drop below sea level (ACWD 2000). Continued over-pumping of the aquifer led to the inward migration of saltwater as far east as the Hayward Fault by the 1950s. Subsequently, saline water migrated downward to the Centerville and Fremont Aquifers and the Deep Aquifer in areas where aquitards separating the aquifers are thin to absent, such as the Forebay area. Saline water may have also migrated downward through abandoned or improperly sealed wells or through wells that are screened in more than one aquifer. The path of salt water intrusion starts from San Francisco Bay and moves laterally into the shallow Newark Aquifer, followed by downward migration of salt water into deeper aquifer systems.

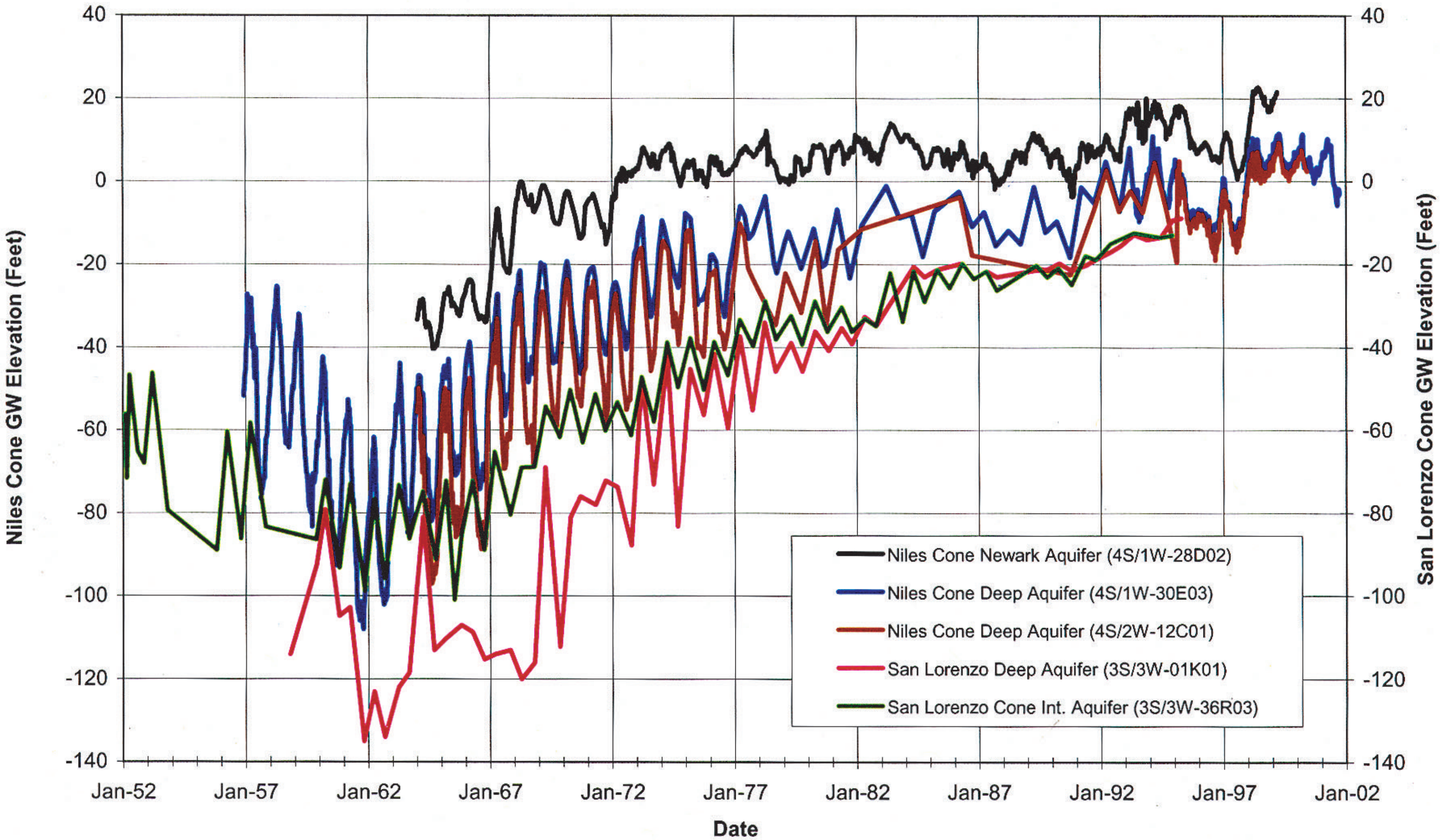
Since the 1960s, ACWD has implemented several measures to control saltwater intrusion and reduce chloride concentrations in the aquifers, including conversion of gravel quarries into a complex of artificial recharge ponds, to supplement natural recharge in the both the Above-Hayward Fault (AHF) and Below-Hayward Fault (BHF) Sub-basins (Figure 3.1-1). At recharge facilities, ACWD impounds surface water in Alameda Creek behind a series of three inflatable dams. Some of the impounded water percolates within the Alameda Creek channel and the rest is diverted off-stream into the adjacent recharge ponds. Percolation from such artificial recharge is received directly to the uppermost regional aquifer, which in the BHF Sub-basin is the Newark Aquifer. In turn, leakage from the Newark Aquifer recharges the Centerville Aquifer, leakage from the overlying Centerville and Fremont Aquifers similarly recharge the Fremont and Deep Aquifers, respectively. Recharge water raises groundwater levels in the Newark Aquifer thereby inhibiting inflow of saltwater and restoring groundwater flow toward the Bay to flush salts out of the aquifer.

The natural source of surface water in Alameda Creek used to artificially recharge the NCGWB is runoff from the Alameda Creek Watershed. However, since 1962, ACWD has augmented this supply with imports from the State Water Project. State Water Project water also supplies ACWD's two water treatment plants.

For 30 years, ACWD has prevented further intrusion of saltwater by maintaining groundwater levels in the Newark Aquifer above sea level. However, a significant amount of the saltwater that previously intruded remains in the basin. A map of the Newark chloride plume in 2002 is presented in Figure 3.1-8. The extent of chloride concentrations greater than the secondary MCL of 250 mg/L in the Centerville and Fremont Aquifers in 2002 is shown in Figure 3.1-9 and the extent in the Deep Aquifer is shown in Figure 3.1-10. While subsurface outflow to San Francisco Bay provides a means of repelling the brackish water plume in the Newark Aquifer from inland areas toward San Francisco Bay, remaining brackish water in the Centerville, Fremont, and Deep Aquifers has been traditionally considered "trapped" because thick aquitards in the western end of the basin prevent vertical upward flow from these deeper aquifer units to San Francisco Bay (via the Newark Aquifer).

In 1974, the ACWD implemented an Aquifer Reclamation Project (ARP) to extract such "trapped" brackish water as another means to reclaim portions of the groundwater basin, particularly in the Centerville-Fremont Aquifer that had been impacted by saltwater intrusion. As part of this program, ACWD utilizes a series of eight ARP wells to pump out brackish water. The location of the ACWD ARP wells, wellfields, and recharge ponds relative to the Proposed Project is illustrated in Figure 3.1-1.

In the fall and spring of each year, ACWD collects water level and water quality data from a number of available wells throughout the NCGWB. This information is reviewed annually to assess the progress of seawater intrusion reversal. Additional monitoring points have been added in the last few years, including wells (added for this project) in the distal northern part of the NCGWB to help characterize the aforementioned transition zone. Water



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LUHDORFF & SCALMANINI CONSULTING ENGINEERS

Source: EBMUD 2003.

Reference: Luhdorf & Scalmanini, Aquifer Test Project: South East Bay Plain and Niles Cone Ground-Water Basins, April 2003.

FIGURE 3.1-7
HISTORIC WATER LEVELS
SEBPB AND NCGWB

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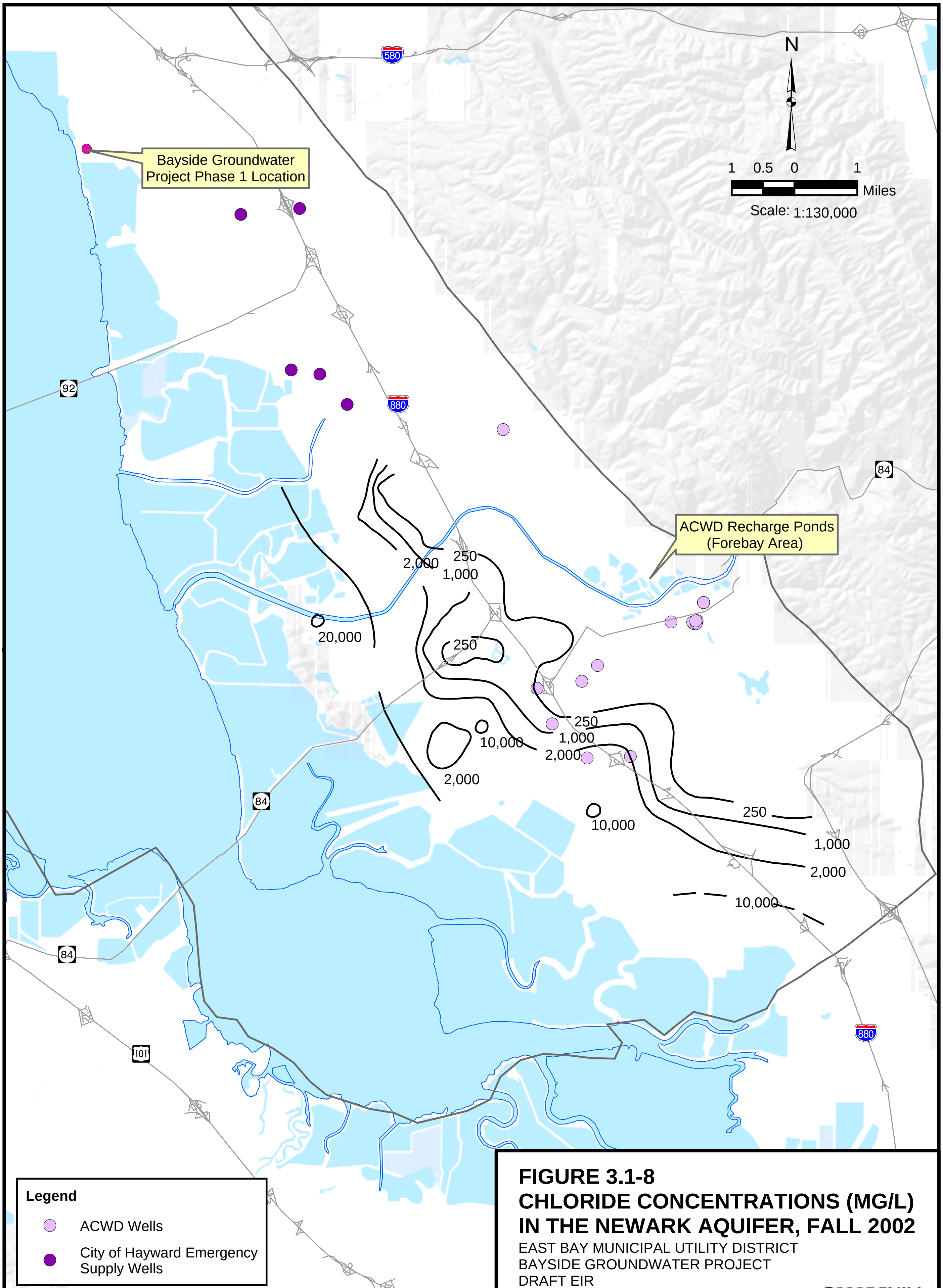

FIGURE 3.1-8
CHLORIDE CONCENTRATIONS (MG/L) IN THE NEWARK AQUIFER, FALL 2002

EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

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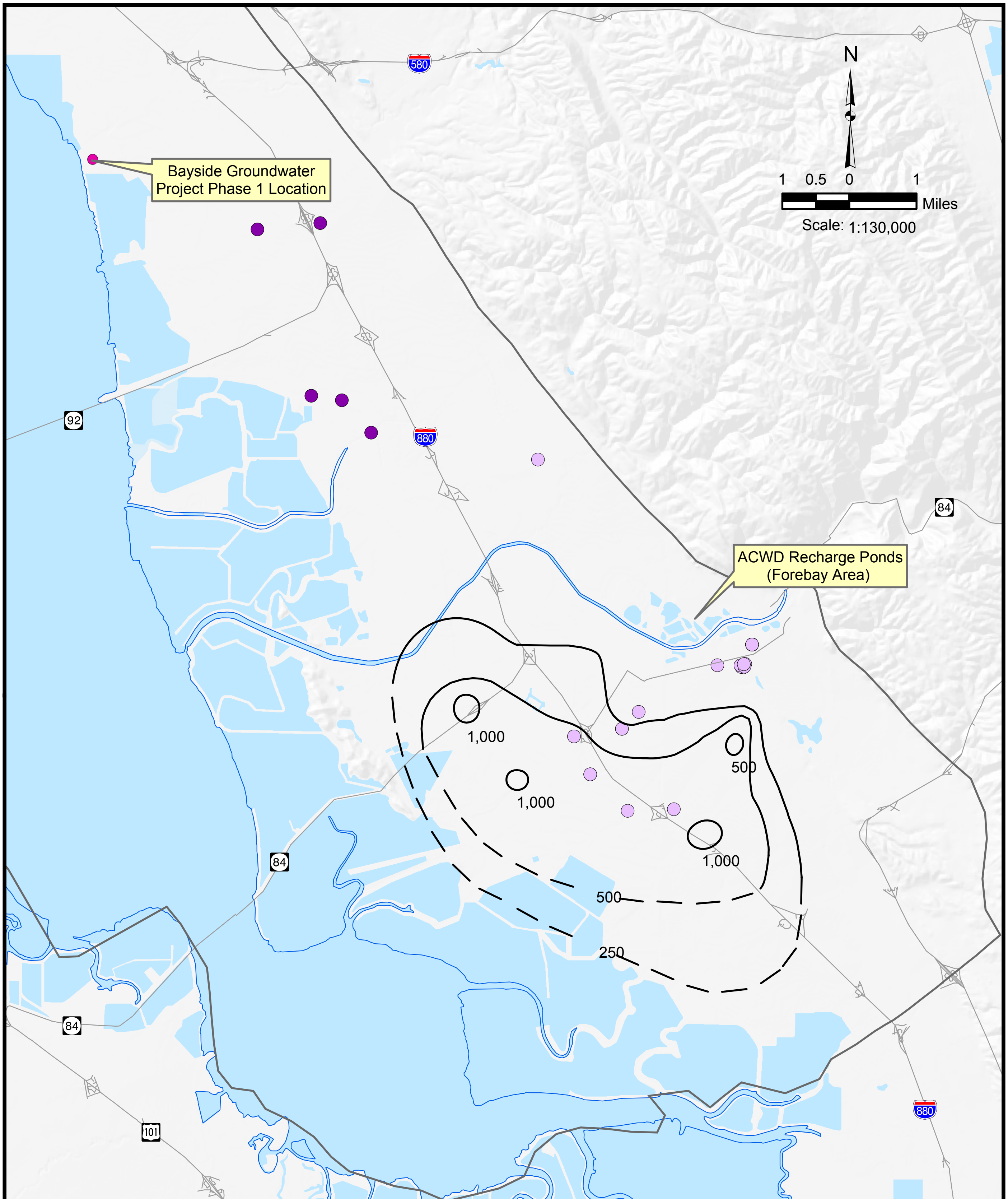

FIGURE 3.1-9
CHLORIDE CONCENTRATIONS (MG/L) IN THE CENTERVILLE/FREMONT AQUIFER, FALL 2002

EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

CH2MHILL

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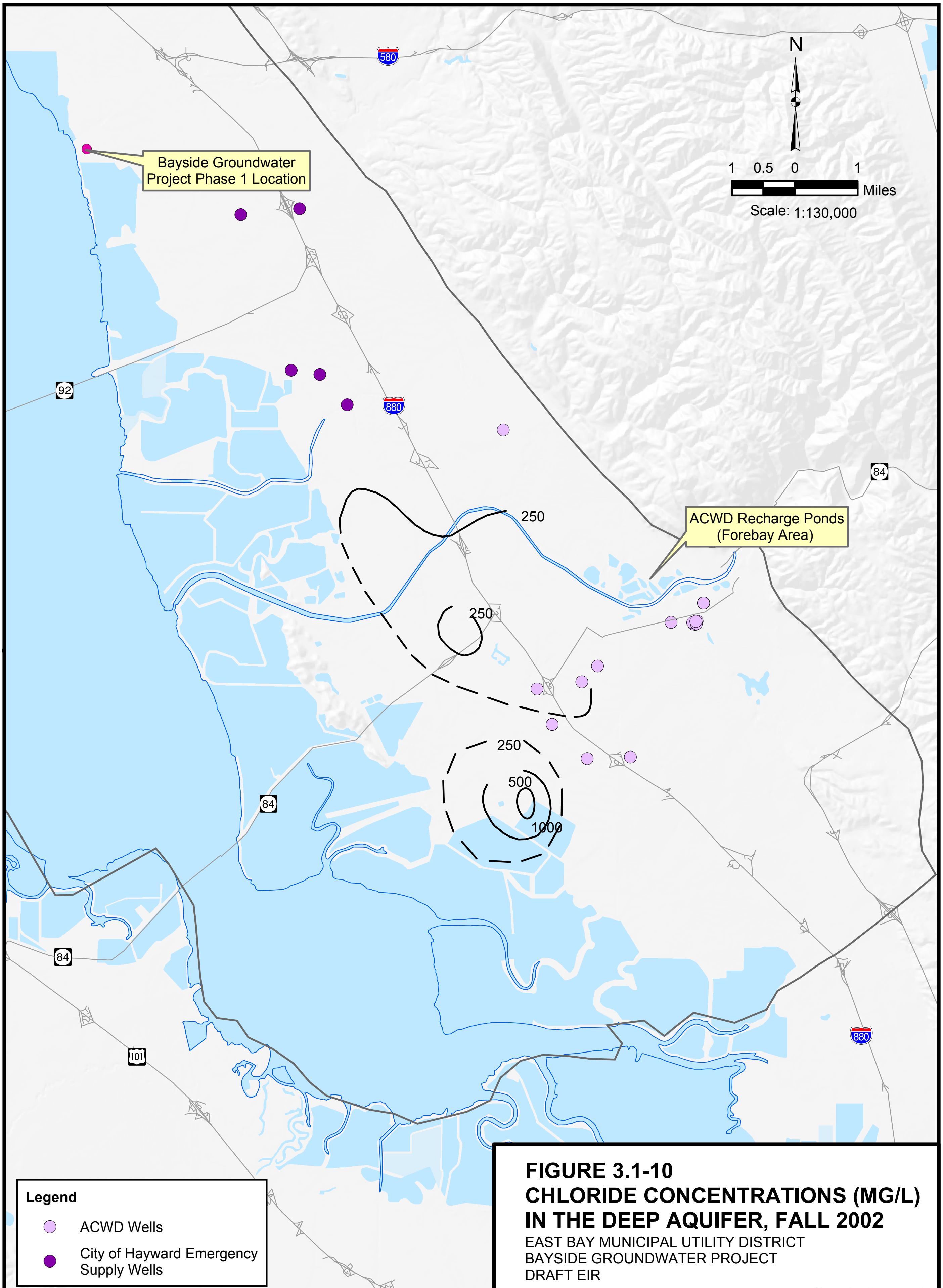

FIGURE 3.1-10
CHLORIDE CONCENTRATIONS (MG/L) IN THE DEEP AQUIFER, FALL 2002

EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

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quality data from some of these new wells has indicated that chlorides in the Deep Aquifer may be migrating in a northerly direction in response to the current flow pattern from the NCGWB toward the SEBPB.

3.1.2.3 Existing Wells and Groundwater Uses

SEBPB

More than 15,000 wells were drilled in San Lorenzo and San Leandro areas of the SEBPB between 1886 and 1950 (USGS 2003). Most of these wells were less than 100 feet deep, although some were more than 400 feet deep and a few were greater than 1,000 feet deep. The East Bay Plain Groundwater Basin Beneficial Use Evaluation Report (RWQCB 1999) estimates that there are presently approximately 4,500 existing wells in the East Bay Plain, based on a variety of well records. The wells are used for agricultural, industrial and municipal uses, though many are inactive. Well permit applications for Alameda County indicates that over 90 percent of the wells are used for irrigation and less than 1 percent of the wells are used for drinking water supply, with the remainder used for industrial process water. Most of the irrigation wells are typically low capacity and screened in the upper aquifer.

There are numerous wells that are known or suspected to be screened in the Deep Aquifer, some of which may be affected by proposed groundwater extraction. These include wells designated for a variety of industrial, landscape, agricultural and municipal uses. There are ten active wells that are permitted for industrial uses. Some of the irrigation wells used at golf courses, cemeteries, high schools, college, nurseries or parks may be screened in the Deep Aquifer. There are few active agricultural wells, but historically groundwater was used extensively for agricultural use and there may be some historically used agricultural wells drilled in the Deep Aquifer that have not been properly destroyed.

Hayward Emergency Supply Wells

The City of Hayward operates an emergency water supply network consisting of five emergency supply wells distributed throughout the city (Figure 3.1-1) to provide a short-term water supply in the event of an interruption in service from the Hetch Hetchy water supply obtained from the City and County of San Francisco. Two of the wells, Wells A and D, are located in the northern area at the Hayward Airport and at the City's Police station off of A Street. The other three wells, Wells B, C, and E, are located in the vicinity of the intersection of Industrial Boulevard and Hesperian Boulevard. Wells D and E are screened in the deep zone of the SEBPB and Well A is screened in the deep and intermediate zone of this basin (Luhdorff & Scalmanini 2002). Wells B and C are screened in the deep zone of the NCGWB. The location of the Hayward emergency supply wells relative to the project production well is illustrated in Figure 3.1-1.

In four of the five emergency supply wells, the pumps are located near the top of the well screens, and the capacity of these wells would be reduced by a lowering of water levels in the groundwater basin. Under existing conditions, the capacity of the Hayward emergency supply wells is nearly 9,400 gallons per minute (gpm). In the event of an interruption of water supply from the City and County of San Francisco, the wells would be expected to be operated for up to seven days, although longer durations of pumping (up to 90 days) could be required. The wells are currently permitted for use by the state Department of Health Services for a maximum period of 7 days.

NCGWB

Numerous wells have been installed in the NCGWB since the 1800s for various agricultural, drinking water, and industrial supplies. Because the area was heavily farmed up to the middle of the 20th century, agricultural uses represented the greatest demand on the basin. Currently, private pumping in the NCGWB (including occasional pumping at Hayward's emergency supply wells subject to replenishment assessment charges levied by ACWD) totals about 3,000 AF per year. ACWD production, including ARP pumping, averages in excess of 25,000 AF per year, and is currently the largest demand on the NCGWB.

Alameda County Water District Water Supply Wells

ACWD has two major wellfields that supply water for potable use: the Peralta-Tyson Wellfield and the Mowry Wellfield in the AHF and BHF Sub-basins, respectively. In addition, ACWD converts a significant fraction of ARP pumping in the BHF Sub-basin for potable use through a desalination facility. Also, ACWD maintains the Whipple Well and Nursery Well as emergency supply wells, both of which are situated in the BHF Sub-basin.

The Mowry Wellfield has multiple wells to enable extraction from all three aquifers of the BHF Sub-basin. Of the ARP wells supplying water to the desalination facility, two are completed in the Newark Aquifer and two are completed in the Centerville-Fremont Aquifer.

ACWD has operated the NCGWB in a balanced "put and take" mode whereby water is recharged into the aquifers before being taken out. Recharge facilities are described in the discussion of salt water intrusion of the NCGWB above (Section 3.1.2.3). In general, ACWD operates the groundwater basin in a seasonal conjunctive use manner, with groundwater supplies used to meet the peak summer demands as well as a smaller portion of ACWD's year-round base demand. The location of the ACWD potable supply wells relative to the project production well is illustrated in Figure 3.1-1.

Existing Monitoring Well Networks

EBMUD currently has a monitoring well network in the SEBPB for the project in San Lorenzo in the vicinity of the Phase 1 facilities, as summarized in Table 3.1-2 (EBMUD 2003). The monitoring wells are located as shown on Figure 3.1-11, except for the Farmhouse Well, located approximately 1.5 miles to the northeast of Well Q, and the Davis Street Well, located approximately 4 miles to the northwest of Well Q. This network would be expanded to include additional monitoring wells for Phase 1 and/or Phase 2. Four agencies in addition to EBMUD currently maintain well databases in the SEBPB and NCGWB. These agencies include the Alameda County Flood Control and Water Conservation District (ACFCWCD), ACWD, City of Hayward, and California Department of Water Resources (DWR). ACWD monitors 282 wells as part of its monitoring program. EBMUD would cooperate with these agencies in sharing monitoring data from each basin to effectively coordinate basin management and to monitor performance of the project.

TABLE 3.1-2
Bayside Groundwater Project – Existing Monitoring Well Network

Well ID	Well Site	Well New Number[1] (Locator)	Address	City	Latitude	Longitude	RP Elevation (ft)	Completion Date	Driller Name	Drilled Depth (ft)	Casing Depth (ft)	Depth of Perforation Begin (ft)	Depth of Perforation End (ft)	Borehole Diameter (in)	Casing Diameter (in)	Casing Material	Perforations (in)	Perforation Type	Seal Depth (ft)
OW-1	GW Bayside	Bay1-MW1	2600 Grant Ave	San Lorenzo			8.593		Pitcher	665	650	520	640	6.5	2	Sch 40 PVC	0.04	Horizontal Slots	490
OW-2D OW-2S	GW Bayside	Bay1-MW2-190 Bay1-MW2-60	2600 Grant Ave	San Lorenzo			9.918 9.738		Pitcher	210	200 60	160 40	190 60	6.5	2	Sch 40 PVC	0.04	Horizontal Slots	150 26
OW-3	GW Bayside	Bay1-MW3	2600 Grant Ave	San Lorenzo			10.056		Layne-Christensen	665	660	525	650	7	2	Sch 40 PVC	0.04	Horizontal Slots	500
OW-4	GW Bayside	Bay1-MW4	2600 Grant Ave	San Lorenzo			9.697		Pitcher	665	660	520	650	6.5	2	Sch 40 PVC	0.04	Horizontal Slots	450
OW-5	GW Bayside	Bay1-MW5	2575 Grant Ave	San Lorenzo			9.256			705	650	520	650	6.75	2	Sch 40 PVC	0.04	Horizontal Slots	650
OW-6	GW Bayside	Bay1-MW6	Grant Ave	San Lorenzo			9.983			707	653	523	653	6.75	2	Sch 40 PVC	0.04	Horizontal Slots	653
Abandoned Oro Loma Well	GW Bayside	Bay-MW-Oro Loma	2600 Grant Ave	San Lorenzo			7.508		Un.	993	993	128	888	Un.	8	Carbon Steel	1/8" x 1"	Vertical Mills Knife	Un.
Q-1	GW Bayside	Bay-MW-Barrett	Barrett School, next to	San Lorenzo	37-40-34.4	122-09-06.6		Feb-01	Bradley & Sons	1025	640	500	630	10.875	4	Sch 40 PVC	0.04	Horizontal Slots	459
R-1	GW Bayside	Bay-MW-Worthley	15600 Worthley	San Lorenzo	37-40-07.0	122-09-04.5		Nov-00	Bradley & Sons	1000	655	480	650	10.875	4	Sch 40 PVC	0.04	Horizontal Slots	450
S-1	GW Bayside	Bay-MW-SL Park	Western tip of San Lorenzo Park	San Lorenzo	37-39-56.5	122-08-44.2		Nov-00	Bradley & Sons	972	680	510	630	10.875	4	Sch 40 PVC	0.04	Horizontal Slots	476
Oro Loma Demon-stration Well	GW Bayside	Bay1-PW	2600 Grant Ave	San Lorenzo			9.231		Eaton	674	662	520	650	30	18	Carbon Steel/SS Steel	0.08	Wire-wrap	479
Test Well	GW Bayside	Bay1-TW-650 Bay1-TW-590 Bay1-TW-560	2600 Grant Ave	San Lorenzo			8.676		Layne-Christensen	665	660	620 570 540	650 590 650	15	6	Carbon Steel/SS Steel	0.05	Wire-wrap	460
Davis Street Monitoring Well	Davis street, one block west of Costco																		
Farmhouse Well	GW Farmhouse	Farm-MW1	526 Lewelling Blvd	San Leandro						882	540	500	530	6.875	2	Sch 40/80 PVC	0.04	Horizontal Slots	450

Note:
[1]Wells renamed for project tracking purposes. Additional monitoring wells installed will use the new naming convention.
Un. = unknown.
Source: EBMUD 2003

FIGURE 3.1-11
LOCATION OF WELLS - EXISTING EBMUD MONITORING WELL NETWORK

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3.1.3 Regulatory Framework

3.1.3.1 Ground Water Quality

The California Water Code requires adoption of water quality control plans that serve as the legal, technical and programmatic basis of water quality regulation for a region. The Regional Water Quality Control Board (RWQCB), San Francisco Bay Region, adopted the Water Quality Control Plan (the Basin Plan) for the San Francisco Bay Basin in 1995(RWQCB 1995). The Basin Plan identifies both the SEBPB and the NCGWB as significant groundwater basins. It establishes water quality objectives for identified beneficial uses of that groundwater, including municipal, domestic, agricultural, and industrial water supplies. The RWQCB is charged with protecting these beneficial uses from pollution and nuisance. Basin Plan goals for groundwater protection and management include regulating activities that impact the beneficial uses of groundwater of the region; and planning, management, and education to avoid future impacts to groundwater resources.

3.1.3.2 Underground Injection

The federal Safe Drinking Water Act established the Underground Injection Control (UIC) Program, is administered by the U.S. Environmental Protection Agency (EPA). Potable water injection wells such as the well to be used in Phase 1 of the project are currently authorized by rule. EBMUD will register the injection well with EPA during project permitting ensure that the injected fluids are contained within the target aquifer system and are in conformance with federal MCLs.

3.1.4 Significance Criteria and Impact Analysis Methodology

The subsections below describe the criteria for determining whether Phase 1 of the project would have significant impacts to groundwater hydrology and quality and the methodology used to assess these impacts.

3.1.4.1 Significance Criteria

Significance criteria provided in the CEQA Guidelines, Appendix G for Hydrology and Water Quality apply to surface water and groundwater. For this DEIR, surface water and groundwater are discussed in separate sections. The significance criteria that apply to groundwater are listed below. The CEQA hydrology and water quality significance criteria that apply to surface water are identified in Section 3.3, Surface Water Hydrology and Quality. In addition, CEQA Guidelines Appendix G provides significance criteria for Geology and Soils, including subsidence. Impacts related to land subsidence induced by groundwater pumping are included in this section, but all other geology and soils impacts are discussed in Section 3.5, Geology, Soils, and Seismicity.

For the purposes of this DEIR and consistent with CEQA Guidelines Appendix G, a project would have a significant impact to groundwater resources if it would:

- Violate any water quality standards;
- 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; or

- Substantially degrade groundwater quality.

Additionally, a project would have a significant impact if groundwater pumping would:

- Potentially result in land subsidence that would cause substantial structural damage, increased flooding or altered drainage pattern.

Criteria for evaluating water quality in the San Francisco Bay area are based on beneficial uses and water quality objectives established by the RWQCB in the Basin Plan, as authorized under the Porter-Cologne Water Quality Control Act and Clean Water Act. Criteria for evaluating public water supply are based on California Drinking Water Standards, as established by the California Safe Drinking Water and the Federal Safe Drinking Water Act. Criteria for evaluating flood hazards are based on effects to on-site and downstream 100-year flood zones, as established by the Federal Emergency Management Agency.

Impacts related to depletion of groundwater and water quality degradation would be considered significant if pumping for the project would:

- Reduce the capacity of the Hayward Emergency Supply Well System by more than two percent below predicted no-project capacity;
- Interfere with the operation of other existing wells in the SEBPB or NCGWB;
- Result in an increase in the amount of chlorides carried into the Newark Aquifer equivalent or vertically from the Bay to the Deep Aquifer of the SEBPB; or
- Result in loss of storage in the aquifer that necessitates changes to ACWD operations and thereby interferes with control of saltwater intrusion by decreasing the amount of salt flushed to the Bay from the Newark Aquifer, increase the downward transport of salts from the Newark Aquifer to the Centerville and Fremont Aquifer, and ultimately to the Deep Aquifer, or enhanced the lateral spreading of an existing chloride plume in the NCGWB.

Impacts related to subsidence would be significant if the project would:

- Result in damage to man-made structures or significantly decrease the existing capacity of flood control structures such that the risk of flooding from a 100-year storm event is increased.

3.1.4.2 Methodology

Potential impacts related to groundwater hydrology and quality are assessed based on evaluating known conditions within the project area and technical studies. Groundwater modeling was used to predict effects on water levels and saltwater intrusion in the SEBPB and the NCGWB from pumping at an average annual rate of 1 MGD. The predicted effects are compared to the thresholds of significance, described above. If a threshold of significance is exceeded the requirement for proposing mitigation measures is triggered.

A groundwater flow model of the SEBPB and the NCGWB was developed using the Integrated Groundwater and Surface water Model (IGSM) code and was used to evaluate the potential effects of Phase 1 of the project on the SEBPB and the NCGWB (CH2M HILL

2005). The joint basin IGSM model, based on an existing IGSM model of the NCGWB and an existing MODFLOW model of the SEBPB, was developed and calibrated under the supervision of EBMUD, ACWD, and the City of Hayward. The use of the calibrated model for impact analysis was agreed upon by all three agencies.

3.1.5 Effects Found to be Not Significant

The following impacts were considered but were found to be insignificant or not applicable to Phase 1 of the Project; therefore, there is no further discussion of these impacts.

Effects of monitoring wells on groundwater. As described in Section 2.4.1.2, Phase 1 will include a project monitoring well network to collect data. The network will use existing and new wells; several new wells are planned for installation (see Figure 2-6). Because these wells do not include pumps and will not be used for pumping, their operation will not affect groundwater levels or quality in the SEBPB or NCGWB.

3.1.6 Impacts and Mitigation Measures

The groundwater and hydrology impacts and mitigation measures for Phase 1 of the project are described below.

Phase 1 Potential Impact 3.1-1. Adverse change in native groundwater quality

During non-drought years, Phase 1 would involve injection and storage of water from the EBMUD distribution system into the Deep Aquifer of the SEBPB. During drought years, water would be extracted from the SEBPB Deep Aquifer, treated to meet drinking water standards at facilities proposed to be located adjacent to Bayside Well No. 1, and then added to the EBMUD distribution system to augment the drinking water supply for its customers. EBMUD conducted a demonstration test to determine the potential for adverse effects associated with injection of existing potable drinking water supplies and mixing with the native groundwater, and then designed Phase 1 to assure that there would be no impacts on water quality. Potential water quality impacts to the native groundwater are discussed below, and potential water quality impacts to the EBMUD distribution system are discussed in Section 3.10.5.

Using the existing Bayside Well No. 1, EBMUD conducted extensive injection and extraction testing to identify water quality impacts, to refine project design, and to develop project operating requirements. The testing involved repeated cycles of injection, storage and recovery, and to date, over 200 million gallons of treated water have been injected from the EBMUD distribution system into the SEBPB Deep Aquifer. After three cycles of injection, storage and extraction, it was demonstrated that the treated drinking water mixes with the native groundwater and modifies the water quality. The degree of mixing depends upon the volume of treated water injected, with less mixing when greater volumes are injected. It appears that the injected water forms a buffer of injected water around the well, and this water is recovered, largely unmixed with native groundwater, during the initial phase of extraction (EBMUD 2003).

The results of the testing also indicated that there would be no adverse geochemical reaction between the native groundwater and the treated water. Although there is potential for clogging of the wells due to the chemical reaction between calcium carbonate and iron hydroxide in the Deep Aquifer, the test indicated that with appropriate pH adjustment of the recharge water, the potential for clogging could be controlled.

Potable water from the EBMUD distribution system contains residual disinfection chemicals in the form of chloramines, which could introduce both chlorine and ammonia to the native groundwater. In the presence of natural organic and inorganic matter in water, chlorine can react chemically and form disinfection by-products, such as trihalomethanes (THMs) and haloacetic acid, suspected carcinogens. However, the demonstration testing and sampling indicated that chloramine residual remained relatively stable and that very low levels of disinfection by-products formed in groundwater compared to levels in surface water sources. The data showed that native groundwater formed about 1 to 2 parts per billion THM and no haloacetic acid. This concentration of THM is well below the primary drinking water standard (maximum contaminant level) of 80 parts per billion. A comparison of water quality of the native groundwater, recovered groundwater and EBMUD treated potable water from surface water sources is included in Section 3.2, Table 3.2-1. The table indicates that the native groundwater when mixed with treated potable drinking water from surface sources would continue to meet all existing primary and secondary drinking water standards and would improve basin water quality overall. Disinfection by-products exist in the EBMUD system at concentrations lower than minimum drinking water standards. Based on pilot testing performed at the demonstration well, concentrations are expected to dissipate underground after injection.

As further assurance of protection of the groundwater resources, Phase 1 would be required to comply with the Underground Injection Program and associated permit administered by the EPA. As described in Section 3.1.3.2, this program provides safeguards so that injection wells do not endanger current and future underground sources of drinking water. Prior to issuing the necessary permit, the EPA would review Phase 1 to ensure that the injected fluids are contained within the target aquifer system and in conformance with federal drinking water standards (referred to as maximum contaminant levels or MCLs).

Therefore, due to the extensive pilot testing program and the resultant design, operational and water quality monitoring measures included in Phase 1 of the project, injection of treated water to the native groundwater would protect and maintain the quality of the groundwater and its beneficial uses. Thus, this impact would be considered less than significant.

Impact Significance: Less than significant, no mitigation required.

Phase 1 Potential Impact 3.1-2. Change in groundwater levels affecting ACWD operations in the NCGWB.

Phase 1 Drawdown Effects in NCGWB

Extraction of up to 2 mgd (maximum annual extraction of 1 mgd) of groundwater during Phase 1 operation would lower groundwater levels in the SEBPB and the NCGWB. In the NCGWB, peak drawdown during groundwater extraction was predicted to occur near the ACWD recharge facilities and Mowry Wellfield (Figure 3.1-12). Expected peak drawdowns in the deeper aquifers are shown on Figures 3.1-13 and 3.1-14. Water levels at the Peralta-Tyson wellfield located above the Hayward Fault, just northeast of the Mowry Wellfield,

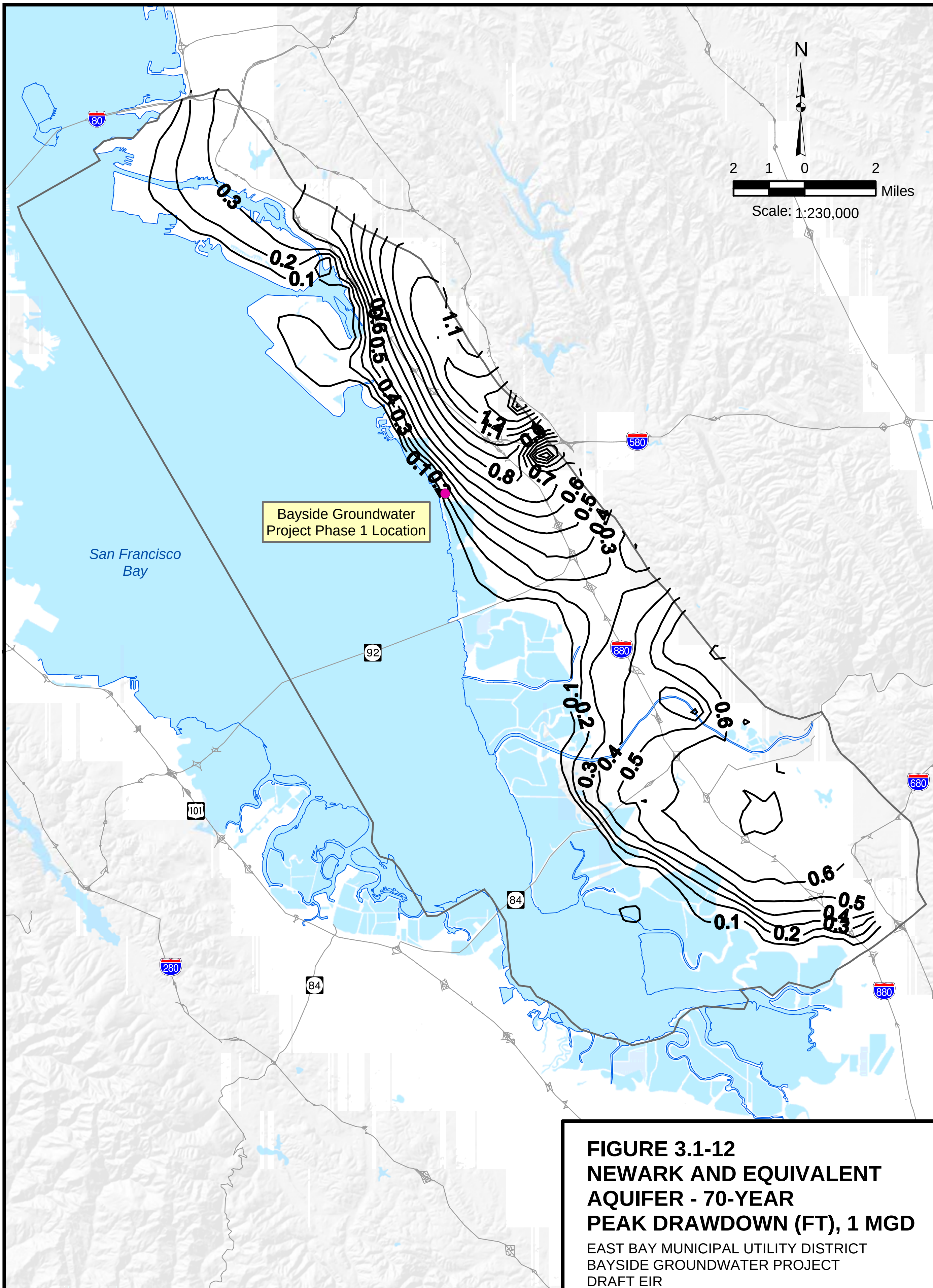

FIGURE 3.1-12
NEWARK AND EQUIVALENT AQUIFER - 70-YEAR PEAK DRAWDOWN (FT), 1 MGD

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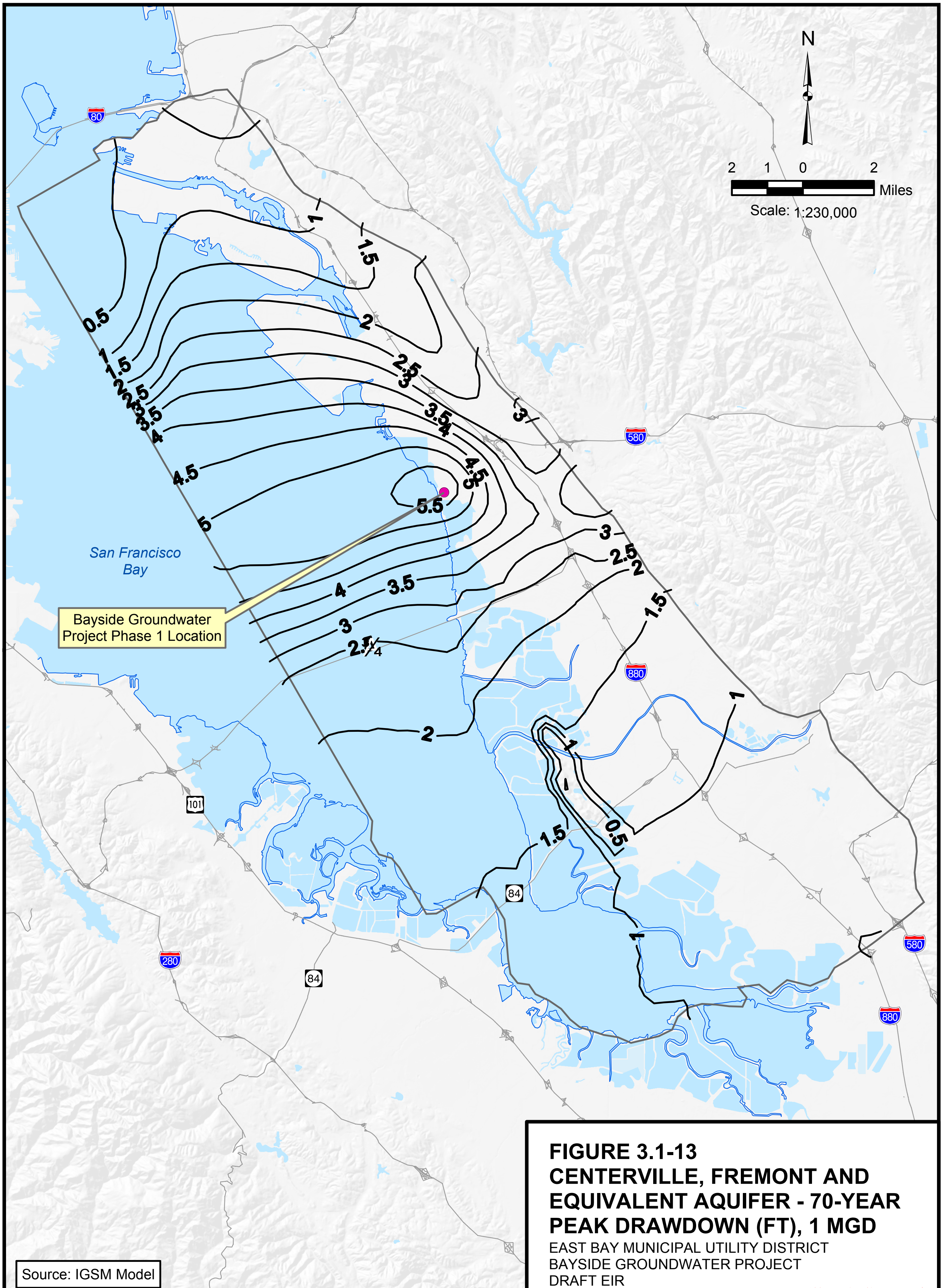

FIGURE 3.1-13
CENTERVILLE, FREMONT AND EQUIVALENT AQUIFER - 70-YEAR PEAK DRAWDOWN (FT), 1 MGD

EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

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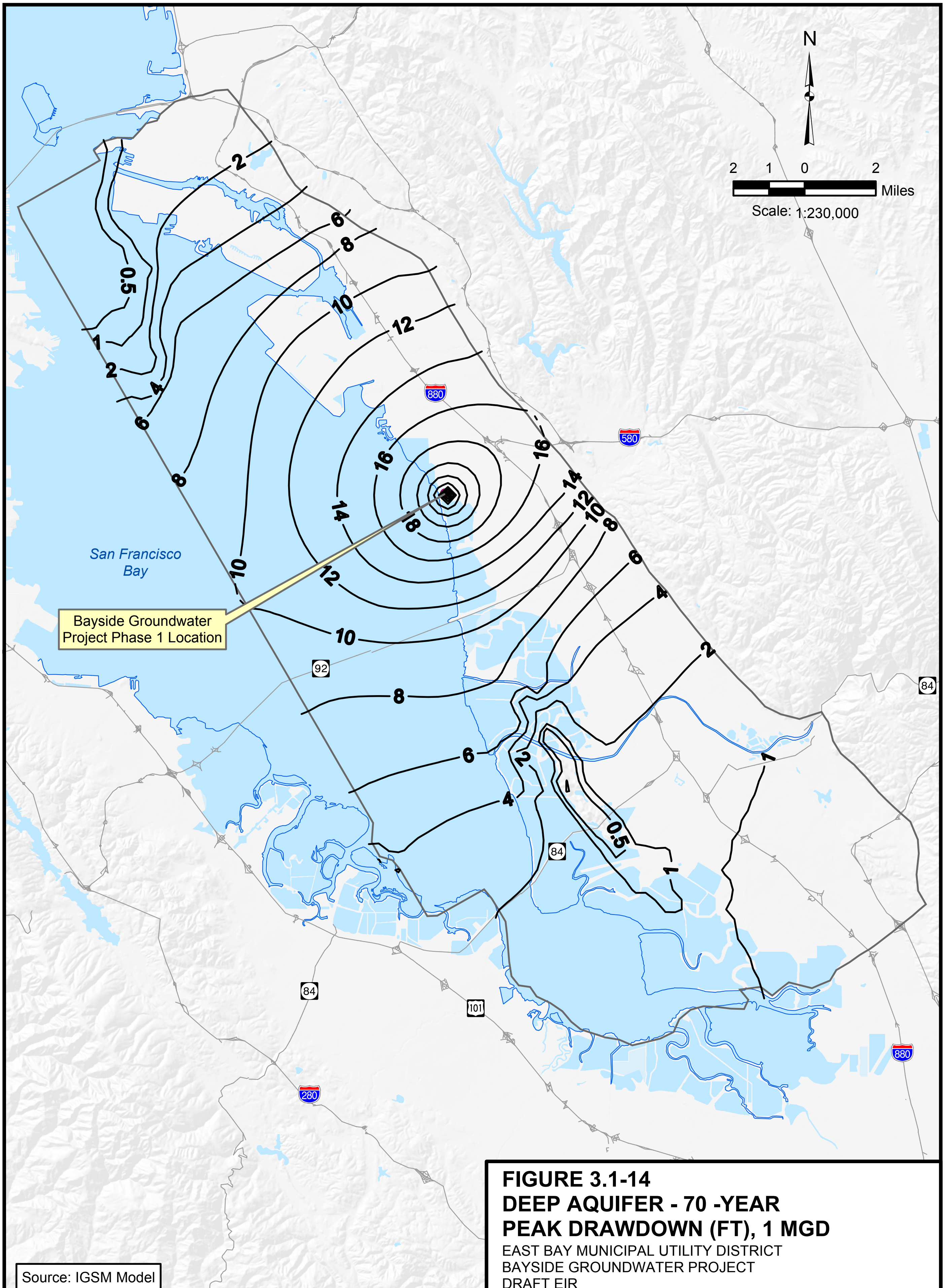

FIGURE 3.1-14
DEEP AQUIFER - 70 -YEAR
PEAK DRAWDOWN (FT), 1 MGD

EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

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would not be expected to be affected because the Hayward Fault is a hydraulic barrier along the eastern border of the Below the Hayward Fault (BHF) sub-basin of the NCGWB.

A reduction in groundwater levels could deplete the groundwater supplies stored in the NCGWB and could affect ACWD's ability to maintain the existing capacity of the ACWD wells in the BHF subbasin. In addition, northward gradients induced by the pumping could increase groundwater flows out of the NCGWB and into the SEBPB. Since much of this water has been recharged by the ACWD which operates the basin in a "put and take" balanced mode, such outflows could decrease the amount of water available for use by the ACWD, especially during drought years when water supplies are stressed. As discussed in Section 3.1.2, Setting, the NCGWB has a limited storage capacity. In general, the maximum groundwater operational level is approximately 20 feet msl, and groundwater levels above this elevation may result in "overflow" losses to San Francisco Bay.

EBMUD, in consultation with ACWD, used the Niles Cone and South East Bay Plain Integrated Groundwater and Surface Water Model (NEBIGSM) and a salt-transport post-processor to forecast the impacts of the proposed 1 mgd Phase 1 on the Niles Cone. For the analysis and development of the input files for the model, rainfall patterns of the 1922 to 2000 period of record were used with the assumption that the future dry and wet cycles will be generally similar in magnitude and duration to the past period of record. Actual background pumping (by well operators other than ACWD and EBMUD) estimated for Year 2000 was repeated for each year of the model simulations used in the impact analysis; however, EBMUD, Hayward, and ACWD water demands (for each year of the simulation) were assumed to be that of Year 2020. ACWD provided monthly forecasts of Alameda Creek flows and groundwater operations in the Niles Cone (pumping and artificial recharge) in consideration of this demand level and the time-variant hydrology over the 79-year simulation period. This set of conditions, which included said ACWD operations in the Niles Cone but no EBMUD groundwater operations in the SEBP, were input into the model for simulation of the baseline (no project scenario). In a separate run for the 1 mgd scenario, proposed EBMUD operations in the SEBP were included in conjunction with ACWD operations in the Niles Cone (and other baseline conditions) to simulate the1-mgd (with project) scenario.

The difference in groundwater levels and flow within the Niles Cone between the project and no project scenarios, and the timing and duration of these water levels and flows, provided the basis of the impact analysis on the Niles Cone as follows: 1) the difference in water levels in the (unconfined) Newark Aquifer provided an indication of the change in groundwater supplies in the NCGWB and the potential for impacts due to high groundwater levels; 2) the difference in outflows from the inland part of the Newark Aquifer to the part of the Newark Aquifer under the salt evaporator ponds adjacent to the bay were considered as an indication of the impact on opportunity to flush salts from the basin and the potential for new sea water intrusion; 3) the change in vertical flows from the Newark Aquifer to the Centerville Fremont Aquifer, and Centerville Fremont Aquifer to the Deep Aquifer, provided an indication of vertical movement (spreading) of salts, and 4) the change in lateral movement of the plumes in the Newark, Centerville-Fremont, and Deep Aquifers were considered in the determination of the potential for the project to affect lateral spreading of existing chloride plumes to pristine areas, or cause a loss in opportunity for plume shrinkage; and 5) the drawdown in the Centerville-Fremont and Deep Aquifers over time were reviewed for determination of possible additional power costs for ACWD to operate production wells.

The model results indicated that for 98% of the 79-year duration of the simulation, the project's drawdown impacts in the Newark Aquifer (in the Forebay area of the NCGWB) did not exceed 0.5 feet. For one month of the simulation when the groundwater basin was not in a stressed condition (i.e., groundwater elevations above 10 feet msl), the drawdown was 0.7 feet. At no time in the simulation did the drawdown exceed 0.7 feet. For over 50 percent of the time, water levels were higher in the Newark Aquifer as a consequence of the project. In addition, the model results indicated the proposed operations would not result in new sea water intrusion in the Niles Cone; would not result in a loss of opportunity to flush salt from inland areas of the Newark Aquifer to the part of the Newark Aquifer underlying the bay or near shore areas; would not increase the vertical and horizontal spreading of salt in existing plumes in the Niles Cone; and would not cause drawdown patterns in the Centerville Fremont and Deep Aquifers such that ACWD could face long-term increases in power costs. The model simulations also made apparent that the injection component of the project was critical to precluding significant negative impacts on the Niles Cone in response to the pumping component of the project.

As a result of this analysis, the proposed 1 mgd Phase 1 is not expected to have a significant impact on the Niles Cone or ACWD operations.

Phase 1 Drawup Effects in NCGWB

Higher water levels in response to proposed Phase 1 injections could cause water levels in some wells to rise above the ground surface and cause overflow at existing wells where the wellhead is not sealed, and could also cause abandoned or improperly sealed wells to flow at the surface. Little change in Newark Aquifer water levels is expected in response to injection (Figure 3.1-15). Wells screened in the Deep Aquifer would be the most susceptible to flowing conditions. A map of the difference between Deep Aquifer piezometric head and the ground surface during the period of peak drawup is presented in Figure 3.1-16. A positive value indicates that the piezometric head is above the ground surface, and that there is potential for wells to flow at the surface. As indicated on Figure 3.1-16, the area where the piezometric head of the Deep Aquifer is above ground surface is similar to no project conditions (Figure 3.1-17). Therefore, potential impacts related to drawup in the NCGWB are less than significant and do not require mitigation.

Although not required for mitigation, ongoing water level monitoring is an integral part of Phase 1 as described in Section 2.4.3.2 of the Project Description.

Impact Significance: Less than significant, no mitigation required

Phase 1 Potential Impact 3.1-3. Changes in groundwater level affecting users of the SEBPB

Operation of Phase 1 at an annual average rate of 1 mgd would cause a decrease in water levels in the SEBPB during pumping and an increase in water levels during injection. Potential impacts to the existing wells in the SEBPB would be dependent on the amount of drawdown that would be experienced, the amount of drawup, and the use, status and construction of the individual wells. When water levels are lowered there is a decrease in well capacity that could impede current pumping rates from existing wells; if water levels are lowered below the bottom of the well screen or the pump, the well would be rendered

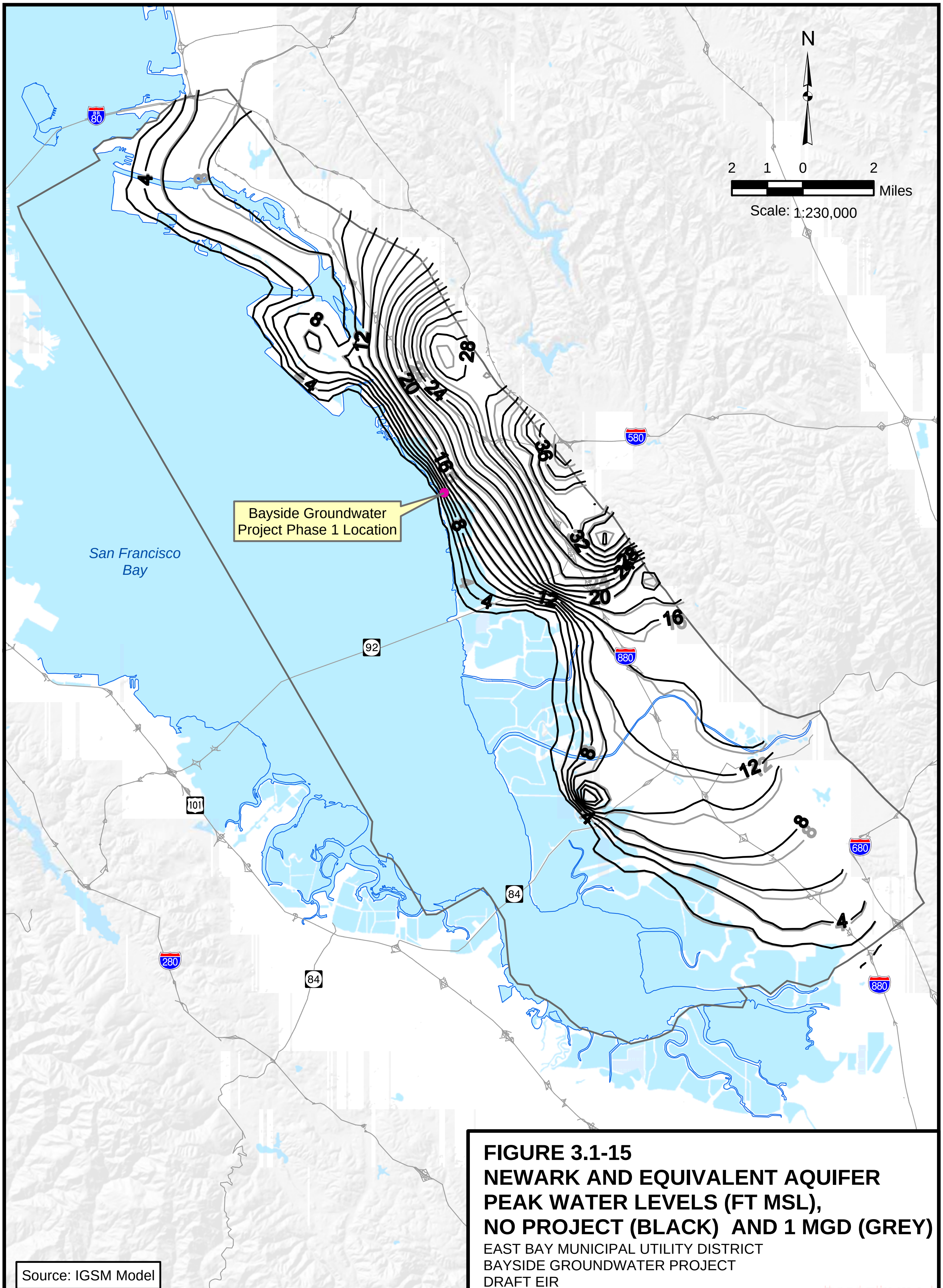

FIGURE 3.1-15
NEWARK AND EQUIVALENT AQUIFER PEAK WATER LEVELS (FT MSL), NO PROJECT (BLACK) AND 1 MGD (GREY)

EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
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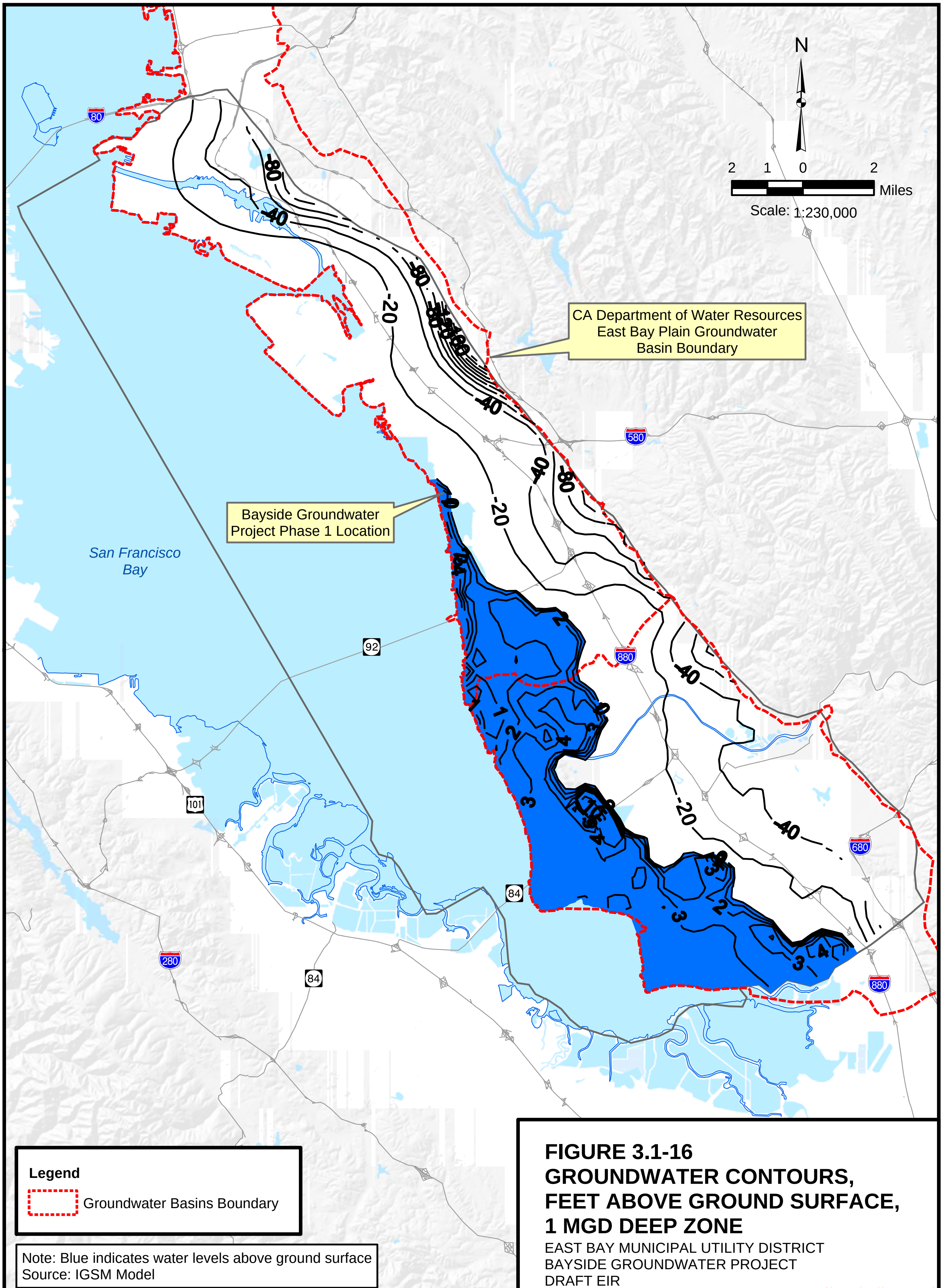

FIGURE 3.1-16
GROUNDWATER CONTOURS, FEET ABOVE GROUND SURFACE, 1 MGD DEEP ZONE

EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

CH2MHILL

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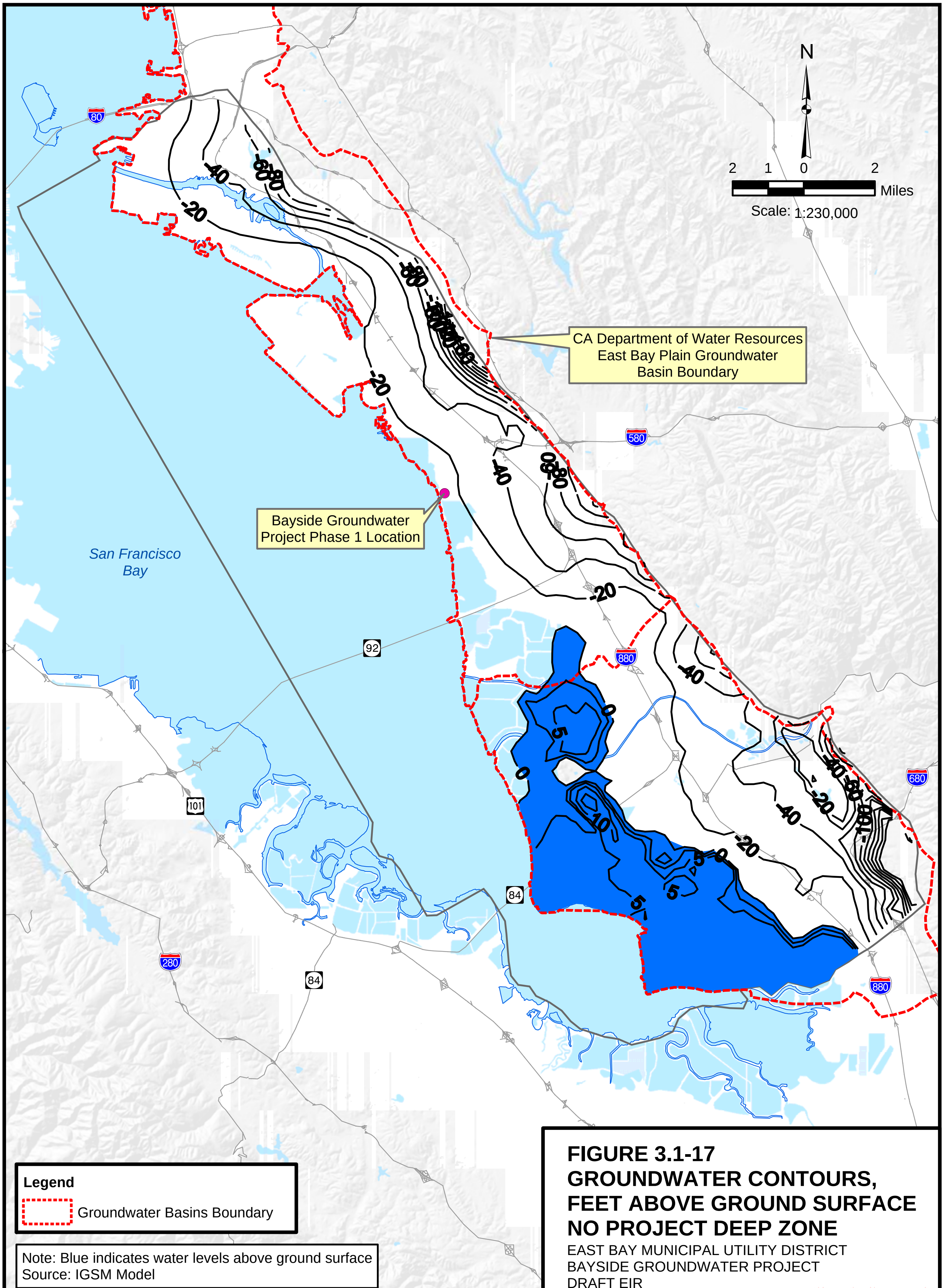

FIGURE 3.1-17
GROUNDWATER CONTOURS, FEET ABOVE GROUND SURFACE NO PROJECT DEEP ZONE

EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

CH2MHILL

temporarily inoperable. When water levels are raised above the ground surface, overflow at existing wells may occur at abandoned, unsealed and improperly sealed wells.

Phase 1 Drawdown Effects in SEBPB

Groundwater modeling performed in support of the project (CH2M HILL 2005) indicates that the maximum drawdown in the Deep Aquifer of the SEBPB would be over 30 feet in the vicinity of the project well during Phase 1, with drawdown effects observed as far north as north Oakland and as far south as Fremont (Figure 3.1-15). Pumping at this rate is predicted to produce drawdowns of up to 1.5 feet in the Newark Aquifer equivalent, with the major drawdown occurring along the Hayward Fault, the eastern boundary of the SEBPB (Figure 3.1-12). Maximum drawdowns of less than 6 feet are predicted in the Centerville and Fremont Aquifer equivalents (Figures 3.1-13 and 3.1-14). Drawdown effects would be short-term in response to pumping and are expected to be reverse when pumping ceases and injection begins.

Phase 1 Drawup Effects in SEBPB

The predicted extent of drawup in each aquifer is shown on Figures 3.1-15 and 3.1-16. As indicated on Figure 3.1-16, the area where Deep Aquifer water levels are above ground surface in the SEBPB is larger than under No Project conditions (Figure 3.1-17) which could cause additional active or improperly abandoned wells to flow at the surface.

Impacts to groundwater users in the SEBPB are potentially significant, but can be mitigated to less than significant with implementation of the following mitigation measures.

Mitigation Measure 3.1-3a. EBMUD will inventory existing wells within the areas of the SEBPB where groundwater modeling indicates that drawdown effects could be observed in response to Phase 1 extractions and water levels could rise above the ground surface in response to injections, including existing use, screened intervals, total depth, and depth of pump. This information will be compared to predicted drawdown and drawup at each well location, and key wells that could be affected by operation of Phase 1 of the project will be identified.

Mitigation Measure 3.1-3b. EBMUD will regularly monitor water levels in key deep zone wells that could experience flowing conditions or be rendered inoperable in accordance with the water level monitoring program. For wells operating at the time the Bayside EIR is certified that are rendered inoperable because of predicted drawdown effects, EBMUD will provide modifications such as deepening of the well or pump to ensure that well operation is retained. Alternatively, an affected well owner within EBMUD's service area could be connected to the EBMUD system if the well cannot be appropriately modified.

Mitigation Measure 3.1-3c: For abandoned or inactive wells located in areas where predicted water levels could be raised above the ground surface in response to injection, EBMUD will work with the property owners to properly destroy the wells in accordance with state standards.

Mitigation Measure 3.1-3d: For active wells located in areas where water levels are anticipated to rise above ground surface during injection, prior to initiating injection EBMUD will retrofit wells that could be pressurized. EBMUD will regularly monitor water levels and conduct surface surveys for "flowing wells." Should monitoring and field observations indicate that a well is flowing due to injection during Phase 1, injection of water will be immediately decreased or stopped. EBMUD will enter into discussions with affected well owners to assess whether the wellheads could be modified to allow for pressurization. Injection rates will not be increased to levels that would produce well overflow again until such modifications were made to the affected wells, or until overflow conditions have stopped.

Impact Significance: Less than significant after mitigation

Phase 1 Potential Impact 3.1-4. Changes in groundwater levels affecting operations of the City of Hayward emergency supply wells

The City of Hayward has emergency supply wells located in both the SEBPB and the NCGWB. Groundwater modeling conducted for Phase 1 of the project indicates that Deep Aquifer groundwater levels in the vicinity of the Hayward emergency supply wells would be lowered by a maximum of approximately 5 feet at Hayward well C to 15 feet at Hayward well D in response to pumping at an average annual rate of 1 mgd (Figure 3.1-15). Maximum annual Phase 1 production would not exceed 1,121 AF per year. On average, water levels and therefore well capacities at the Hayward wells will be increased during Phase 1 of the project because of the injection operation described in Section 2.3.2 of this DEIR. However, four of the emergency supply wells rely on all of the available drawdown under existing conditions to maintain full pumping capacity and drawdown induced during Phase 1 of the project would be expected to reduce total yields from the well field by a maximum of approximately 185 gpm (two percent of total system capacity).

Pressurization of the Hayward emergency supply wells could occur if water levels in this area rise above ground surface in response to injection in the Deep Aquifer. Pressurization of the wells could interfere with the City's ability to maintain their wells including pump maintenance. Phase 1 modeling predicts a maximum draw up of 3 to 10 feet in the vicinity of the Hayward emergency supply wells. The model predicts that water levels at Well E may be a maximum of 2.5 feet above the land surface during periods of injection during Phase 1.

Implementation of the following measures would reduce groundwater impacts on the Hayward Emergency Supply Wells to less than significant.

Mitigation Measure 3.1-4a. EBMUD will provide up to $50,000 of funding to the City of Hayward for the City to add additional emergency capacity to the City's well system or for the City to make other system improvements to mitigate impacts to that system resulting from Phase 1 of the project. EBMUD will also provide surplus water to Hayward through existing or planned emergency interties consistent with existing emergency intertie agreements.

Mitigation Measure 3.1-4b. If water level rises in response to injection into the Deep Aquifer render the Hayward emergency supply wells inoperable due to pressurized conditions, EBMUD will retrofit the wellheads to allow for pressurization.

Impact Significance: Less than significant after mitigation

Phase 1 Potential Impact 3.1-5. Saltwater intrusion in the SEBPB and NCGWB and/or movement of pre-existing plumes of brackish water in the NCGWB

Saltwater intrusion is the movement of saline water into a fresh water aquifer. It can occur in coastal aquifers, such as the SEBPB or the NCGWB, where the shallow aquifers are in communication with the Bay. Intrusion of saltwater into a freshwater aquifer degrades the water quality for most beneficial uses and, depending on the degree of salinity, can render the aquifer unusable. Once freshwater aquifers are affected by saltwater intrusion, it is difficult and costly to reclaim the aquifer.

South East Bay Plain Groundwater Basin

Under normal conditions, recharge to the SEBPB creates a hydraulic gradient in the Newark Aquifer equivalent from the hills west towards the Bay. However, if pumping during Phase 1 of the project causes sufficient drawdown in the Newark Aquifer equivalent, the gradient could be reversed and saltwater could intrude into the aquifer. In addition, if pumping from the Deep Aquifer increases the vertical gradient of groundwater flow from the shallow aquifers to the Deep Aquifer, pumping during Phase 1 may increase the flow of Bay water to the Deep Aquifer.

As discussed under Phase 1 Impacts 3.1-2 and 3.1-3, pumping at an annual average rate of 1 mgd from the Deep Aquifer is predicted to result in a maximum drawdown of 1.5 feet in the Newark Aquifer equivalent of the SEBPB (Figure 3.1-12). The change in water levels in response to this pumping would not change the overall groundwater flow gradient and direction. Groundwater modeling also indicates that Phase 1 pumping would not cause a significant increase in salt transport from the Bay to the Deep Aquifer as a result of an increased vertical groundwater gradient. Therefore, the potential for saltwater intrusion in the SEBPB is considered less than significant for Phase 1 and no mitigation is necessary.

Niles Cone Groundwater Basin

As discussed in Section 3.1.2, Setting, there is an existing chloride plume within the Newark Aquifer resulting from historic pumping that lowered water levels to below sea level and allowed intrusion of saltwater into the aquifer. ACWD has constructed recharge ponds in the Forebay area to increase the hydraulic gradient towards the Bay and thereby flush the existing saltwater out of the aquifer. Chloride plumes are also present in the Centerville and Fremont Aquifer and Deep Aquifer as a result of downward migration of chloride from the Newark Aquifer. ACWD also operates Aquifer Reclamation Program (ARP) wells to remove brackish water from localized areas within each aquifer.

Proposed groundwater pumping could lower water levels in the Newark Aquifer in the vicinity of the recharge ponds and elsewhere that in turn would reduce flushing of the aquifer. Lowering of water levels in the Deep Aquifer in response to pumping could also increase chloride transported from the Newark Aquifer to the underlying Centerville and Fremont Aquifers, and subsequently to the Deep Aquifer. However, groundwater modeling performed for Phase 1 (CH2M HILL 2005) indicates that, because the volume of injected water is expected to exceed the volume of extracted water, there would be a net three percent decrease in the vertical migration of salts from intermediate aquifers of the NCGWB to the Deep Aquifer as well as no change or a decrease in the lateral migration of salts within all aquifers. On the basis of these results, Phase 1 of the project would not cause new sea water intrusion or to interfere with progress to expel sea water constituents in the aquifers and repel/shrink brackish water plumes. Therefore, Phase 1 would have a beneficial effect on saltwater intrusion in the NCGWB and no mitigation is required.

Impact Significance: Less than significant, no mitigation required

Phase 1 Potential Impact 3.1-6. Permanent land subsidence resulting from exceeding historic low water levels

Groundwater contained within aquifers and aquitards helps support the weight of the overlying sediments because the water contained in the pore spaces in the sediments creates an internal water pressure. Land subsidence, or the lowering of ground surface elevations, can occur if groundwater pumping reduces the water pressure within the pore space of the saturated sediments, causing the sediments to compress. The degree of subsidence depends on the extent of groundwater pumping and the resulting change in the internal water pressure.

Under some conditions, this process would reverse when the groundwater is replenished and the pore pressure increases; this is known as *elastic* or *temporary* subsidence. This results in cycles of very small amounts of compression and expansion that occur normally in response to alternating periods of groundwater drawdown and recovery. Under conditions of elastic subsidence, the compaction is relatively small and is reversed when pore pressures increase due to rising water levels, including during injection of groundwater. In general, subsidence in the coarser-grained materials of the aquifers is elastic. A small amount of elastic subsidence is expected to occur over a broad area of the SEBPB in response to pumping, which is what happens when any well in a confined aquifer produces water. The amount of this elastic subsidence is a function of the amount of drawdown, and in the case of the Proposed Project is expected to range from about a quarter inch at the project site (Bayside Well No. 1; corresponding to a water level drawdown of about 40 feet) to about a tenth of an inch several miles from the project site. This elastic subsidence would completely reverse following each groundwater pumping cycle as water levels recover. The land would rise along with the water levels until it reached its original position when water levels are fully recovered. This recovery would take about as long a time to reach as the well was pumped, so if the well was pumped for six months, then water levels and the land surface would also recover their original position in about six months. This time for full rebound could be shortened if water is injected into the well.

Under certain conditions, groundwater pumping can result in a permanent change in the structure of the sediments, known as *inelastic* subsidence, and cause a non-recoverable compaction of the aquifer system. Inelastic subsidence occurs when the water pressure in finer-grained sediments is reduced beyond their historic lows, resulting in a permanent change to the intergranular structure of the sediments that cannot be reversed when water levels recover. The compressibility of sediments under inelastic conditions is much greater than under elastic conditions and may require decades to millennia to complete.

The rate of subsidence depends on the rate of change in water pressures as well as the properties of the sediments, including the thickness, pore volume, stored water content, and hydraulic conductivity. In coarser-grained materials, such as the sands and gravels that comprise the Deep Aquifer, the change in pore pressure is roughly uniform throughout the thickness of the sediments and can be monitored by measuring changes in water levels in observation wells (also called piezometers). However, in finer-grained materials such as clays and silts that comprise the aquitards, the lower hydraulic conductivity of the materials restricts the rate at which the water can migrate vertically out of or into the aquitard in response to pumping. As a result, the changes in internal pressure, intergranular stress, pore volume, and bed thickness may lag far behind the changes observed in the aquifers, and these changes would not be directly measurable by monitoring water levels. Direct measurements of changes in thickness, by land survey or high-resolution sensors called extensometers, would be required to detect compression in these sediments.

In the event of permanent, inelastic subsidence, there would be a gradual lowering of ground surface elevations over a widespread area overlying the affected groundwater basin, which could result in other physical effects. For example, potential long term effects of land subsidence in the SEBPB could include increased flooding, greater backflushing of waters from the Bay, increased saltwater intrusion in shallow aquifers, increased coastal flooding, submerging of existing marshlands, and changes in gradients within canals and other gravity flow features. Damage to infrastructure and public and private structures would not be expected because subsidence effects would occur on a gradual, widespread basis. Land subsidence generally does not result in differential settlement, which is characterized by localized changes in ground surface elevations and can cause structural damage, and this effect is not expected in the SEBPB.

Historically, subsidence due to excessive groundwater pumping has occurred in the Bay area, notably the Santa Clara Valley, which experienced subsidence of up to 13 feet before measures to control land subsidence were implemented. With implementation of control measures, the Santa Clara Valley Water District has been able to control subsidence rates in the valley to less than 0.01 foot per year since the 1970s.

Potential for Phase 1 to Cause Permanent Subsidence

During Phase 1, groundwater extraction would occur at an annual average rate of 1 mgd and with a maximum extraction rate of 2 mgd. Resulting decline of groundwater levels in the SEBPB and NCGWB is discussed above in Phase 1 Impacts 3.1-2, 3.1-3 and 3.1-4. The potential for inelastic subsidence depends on both the magnitude and duration of drawdown. Model results indicate that aquifer water levels in response to pumping at an average rate of 1 mgd at Bayside Well No. 1 (2 mgd instantaneous) are at least 25 to 50 feet above observed historic lows. This analysis indicates that that inelastic subsidence is highly unlikely to occur since water levels are well above historical lows and the duration of Phase 1 pumping will be shorter than that which caused the historic low water levels. Although inelastic subsidence would not be expected, subsidence will be monitored as part of Phase 1, as stated in the Section 2.4.3.1 of the project description. Should inelastic subsidence be observed, the impact can be kept to less than significant with the following mitigation measure.

Mitigation Measure 3.1-6. As described in Section 2.4.3.1, monitoring for subsidence will be conducted on a real-time continuous basis throughout operation of the project. Phase 1 of the project will be implemented incrementally initially to allow observations of the response of the groundwater system and surrounding soils to project operations. This slow startup and ongoing monitoring will provide the ability for EBMUD to respond quickly should monitoring indicate that permanent subsidence is occurring at a level that could adversely affect overlying land uses. The accuracy of well-constructed extensometers is on the order of micrometers (0.001 millimeters). After project startup, extensometers will be monitored on a daily or more frequent basis and data continuously reviewed to assess whether subsidence is occurring and whether it is elastic or inelastic. If any inelastic subsidence is detected the accuracy of the extensometers is such that it will be a very small amount measurable near the Bayside Well No. 1, and EBMUD would implement corrective action, such as reducing pumping rates or ceasing extractions.

Impact Significance: Less than significant after mitigation

3.1.7 References – Groundwater Hydrology and Quality

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3.2 Phase 1 Water Quality, Treatment, and Distribution

This section describes impacts and mitigation measures related to water quality, treatment, and distribution for Phase 1 of the project.

3.2.1 Approach to Analysis

The Proposed Project would provide a new source of water for EBMUD. The quality of this new water source would differ somewhat from that of current supplies. Pressures in the distribution system would be affected by operation of the Proposed Project because the water would be added to the distribution system at a different location than the one at which water is currently added.

The evaluation of impacts in this section is based on a review of current water quality and pressure conditions in the area affected by Phase 1 of the Proposed Project, the results of pilot testing of injection/extraction and groundwater treatment, and modeling of EBMUD's distribution system.

3.2.2 Setting

The subsections below describe EBMUD's existing treatment and distribution system and issues related to water quality.

3.2.2.1 Existing EBMUD Treatment and Distribution System

EBMUD is a multipurpose regional agency that provides water to an estimated population of 1.3 million throughout portions of Contra Costa and Alameda Counties. (See Figure 1-1 for a map of the District's service area and water supply system).

Approximately 95 percent of the District's water supply originates in the Mokelumne River watershed in the Sierra Nevada mountains. Rainfall and snowmelt are collected in Pardee Reservoir and transported 82 miles through the Mokelumne aqueduct system as shown in Figure 1-1. The aqueduct system is comprised of three steel pipelines ranging from 5 to 7 feet in diameter, with capacity to carry up to 325 million gallons per day with pumping at the Walnut Creek pumping plant. The balance of the District water supply comes from local runoff collected in five terminal storage reservoirs within EBMUD's service area. The local terminal reservoirs are Briones, Chabot, Lafayette, San Pablo, and Upper San Leandro. In addition, EBMUD operates six water treatment plants (WTPs): Lafayette, Orinda, San Pablo, Sobrante, Upper San Leandro (USL), and Walnut Creek. Water currently delivered to the portion of EBMUD's service district that would be affected by Phase 1 is treated at either the Orinda WTP or the USLWTP.

The Orinda WTP is an in-line filtration plant that treats Mokelumne River water from Pardee Reservoir. During peak demand periods, the Orinda plant also treats water from Briones Reservoir. The Orinda WTP includes coagulation with polyaluminum chloride; filtration through dual-media gravity filters; disinfection with sodium hypochlorite; ammonia addition to form chloramines for disinfection in the distribution system; fluoridation with hydrofluosilicic acid; and pH adjustment with caustic soda.

The USLWTP is a conventional water treatment plant that treats water from Upper San Leandro Reservoir, which contains mostly local runoff. The treatment process includes aeration; coagulation with alum and polymer; flocculation; sedimentation; intermediate ozonation; filtration through dual-media gravity filters; disinfection with sodium hypochlorite; ammonia addition to form chloramines for disinfection in the distribution system; fluoridation with hydrofluosilicic acid; and pH adjustment with caustic soda. During severe taste and odor episodes, hydrogen peroxide is also added concurrently with ozone. The USLWTP is operated seasonally from April through November. It is removed from service from November through March because all water demand during that period can be met through the Orinda WTP.

Because the topography of EBMUD's service area varies from sea level to over 1,900 feet, a large number of pressure zones (PZs) are required to provide water service within a reasonable range of water pressure. Currently, 120 PZs serve the District. The Proposed Project is located in the southern portion of EBMUD's Central PZ. The Central PZ, the largest PZ in the District, serves approximately 110,000 accounts from Richmond in the north to San Lorenzo in the south. Average demand in the southern portion of the Central PZ (south of High Street) is 25 million gallons per day. The southern portion of the Central PZ, shown in Figure 3.2-1, receives treated water from both the Orinda WTP and the USLWTP. Water in the Central PZ is not delivered to any other PZs. Two reservoirs serve the southern portion of the Central PZ: Dunsmuir and South. The volume of water in these reservoirs fluctuates daily to balance demand (which changes throughout the day) with supply (which is more or less constant).

3.2.2.2 Water Users in the Vicinity of the Project

There are approximately 60,000 customer accounts within the southern portion of the Central PZ, which is shown in Figure 3.2-1 (south of High Street). Ninety percent of these accounts are for residences. Figure 3.2-2 illustrates the distribution of water consumption within the southern portion of the Central PZ. Single- and multi-family dwellings consume 67 percent of the water delivered to this portion of the District. Industrial and commercial users account for approximately 25 percent of the demand.

3.2.2.3 Existing District Water Quality

Table 3.2-1 shows the key water quality parameters for water produced by the Orinda WTP and the USLWTP, which supply the southern portion of the Central PZ. Current and proposed drinking water quality standards for these parameters are also shown in the table, expressed as maximum contaminant levels (MCLs) that are not to be exceeded. The proportion of water originating from these sources varies seasonally and operationally within the District's water system, with consequent differences in water quality.

Subsurface investigations conducted at the Bayside Well No. 1 site and other areas in the East Bay indicate favorable geologic conditions and good native groundwater quality in the Deep Aquifer. Most of the water quality data for native groundwater were collected at Bayside Well No. 1. As shown in Table 3.2-1, native groundwater in the Deep Aquifer in the Phase 1 area meets all current primary (health-based) drinking water standards and all secondary (aesthetic-based) standards, except for manganese. Manganese can cause staining

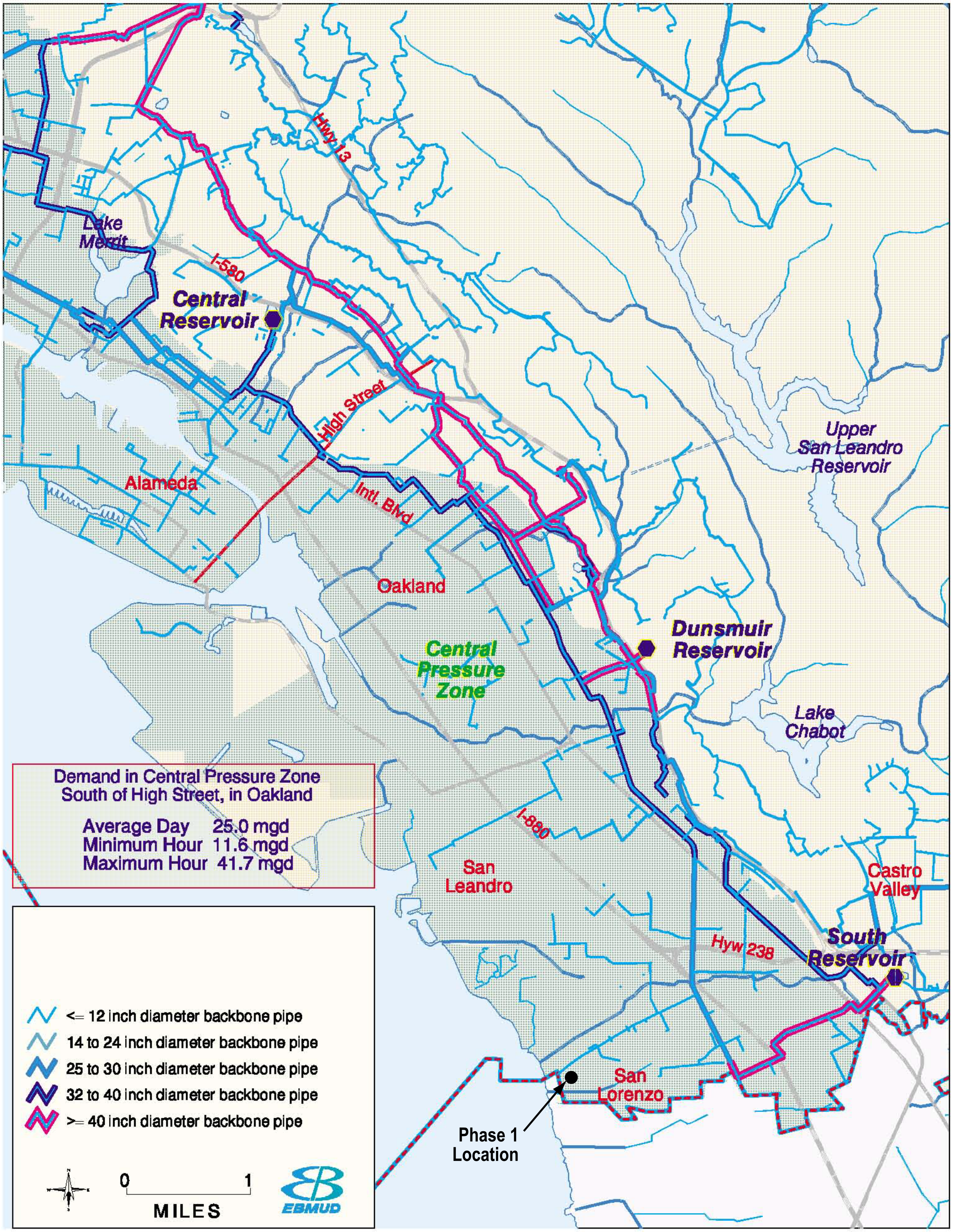

FIGURE 3.2-1
CENTRAL PRESSURE ZONE SOUTHERN PORTION
EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
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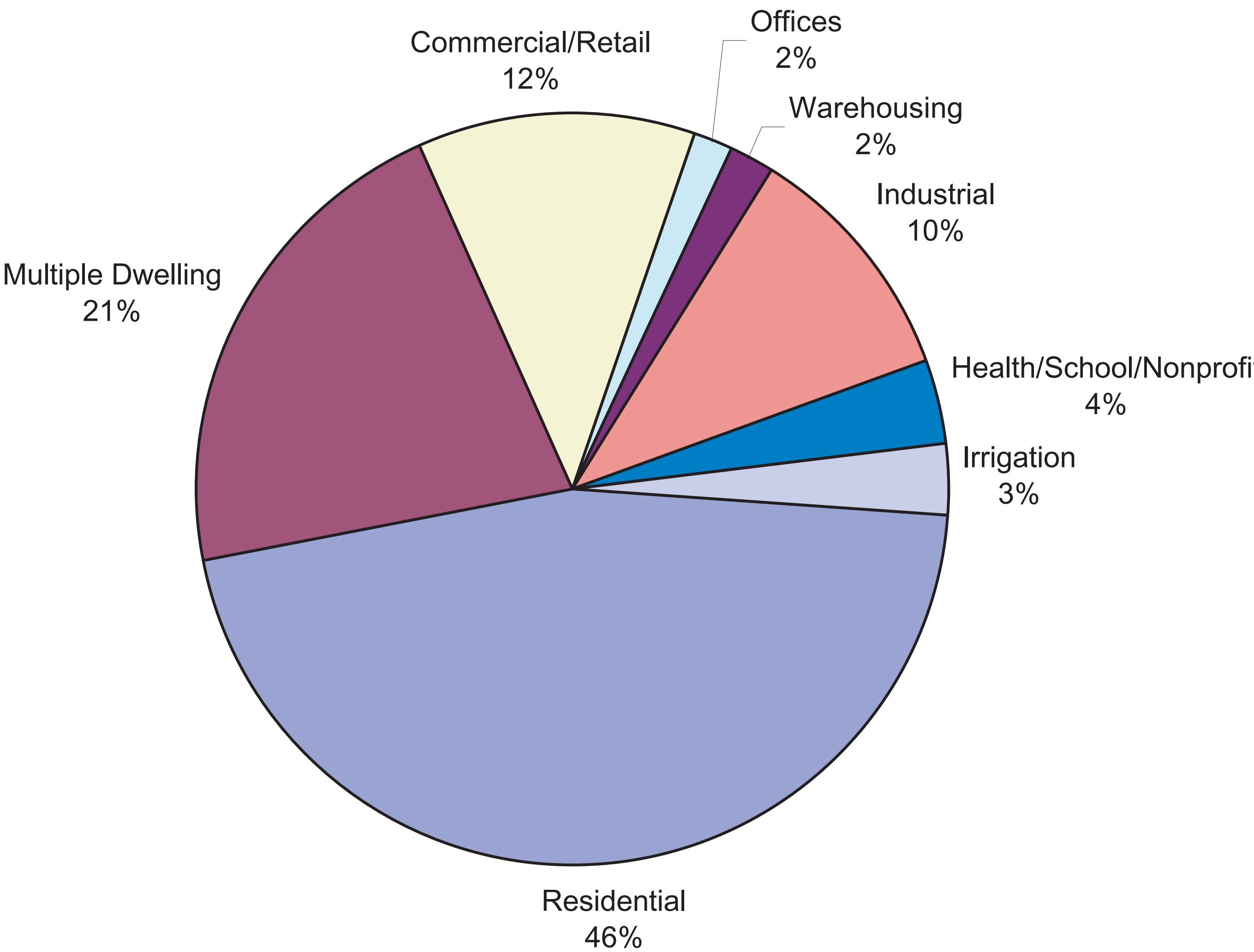

Total number of accounts; 60,224
Total consumption: 24.8 mgd
1999 EBMUD data

FIGURE 3.2-2
WATER CONSUMPTION
IN THE SOUTHERN PORTION
OF THE CENTRAL PRESSURE ZONE
EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
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of plumbing fixtures and laundry when present at elevated levels. It is a common but readily treatable constituent in groundwater.

TABLE 3.2-1
Comparative Water Quality Parameters from Water Treatment Plants and Recovered Groundwater

Parameter	Maximum Contaminant Level	Orinda WTP[b]	USL WTP[b]	Native GW [c,e,g]	Recovered GW [d,f,g]
Turbidity (NTU)	5.0 [a]	0.06	0.10	0.19	0.21 – 0.23
Total Organic Carbon, ppm	NS	1.5	3.3	2	0.6 – 2.5
Total Dissolved Solids (TDS), ppm	500 [a] (recommended)	41	210	440-520	85 – 240
Chloride, ppm	250 [a] (recommended)	4.4	15	64	9 – 52
Manganese, ppb	50 [a]	ND	ND-23	129-320	7 – 116
Iron, ppb	300 [a]	ND	ND	56	8-130
Arsenic, ppb	10	ND	ND	1.3– 2.1	<7 [f]
Radon, pCi/L	NS	NM	NM	800	470 – 700
Uranium, ppb	30	ND	ND	<1	0.1 - 2
Gross Alpha, pCi/L	15	ND	ND	1	0.6 - 3
Gross Beta, pCi/L	50	ND	ND	1	NM
Radium 226/228, pCi/L	5	NM	NM	NM	0.1
Trihalomethanes, ppb	80	32 – 47	17 – 45	ND – 0.45	19 – 45
Haloacetic Acids, ppb	60	13 – 18	7– 24	1	1 – 4
Alkalinity, bicarbonate, ppm	NA	20.2	114	210	44 – 170
pH	NA	8.9 – 9.5	8.6 – 9.0	7.8	7.6 – 8.1
Hardness, ppm	NA	15 – 30	95 – 130	110 – 170	31 – 82
Sulfate, ppm	250 [a] (recommended)	1.5	39	48	13 – 39
Aluminum, ppb	200 [a]	ND	ND – 126	ND – 10	9.2 – 70.6

Notes:

GW = groundwater
NA = not applicable
ND = not detected
NM = not measured
NS = no standard
NTU = nephelometric turbidity units
pCi/L = picocuries per liter
ppb = parts per billion
ppm = parts per million

[a] Secondary standard (aesthetic, not health based)

[b] 2000 data

[c] Bayside Well No. 1 (screened between 520 and 650 feet below ground level)

[d] Bayside Well No. 1 injection/extraction pilot test

[e] Values shown for native groundwater and recovered groundwater are for untreated water. Under the proposed project, water delivered to customers would be treated to reduce concentrations of manganese. Levels of iron and arsenic would also be reduced during treatment. pH would be increased during treatment to match current levels in EBMUD's distribution system. Levels of other constituents listed would not be expected to change during treatment.

[f] Arsenic concentrations in recovered groundwater were below the level of detection (7 ppb) for the analytical method used. Actual concentrations were likely similar to those shown for the injection water and native groundwater.

[g] The source of these data is EBMUD.

Synthetic organic compounds, such as pesticides, organic solvents, and methyl tertiary butyl ether (MTBE), have not been detected in groundwater from the Deep Aquifer in the project area. To serve as a drinking water supply, native groundwater would require treatment for manganese because manganese levels can exceed the secondary MCL.

Radionuclides such as gross alpha, gross beta, uranium, radium, tritium, and strontium are either not detected or are present in the groundwater at concentrations that are an order of magnitude lower than current and proposed MCLs. They are not compounds of concern.

The salinity in native groundwater exceeds that of the normal range of water served to customers in the project area. A common measure of salinity is total dissolved solids (TDS). Chloride and sulfate concentrations and hardness are also indicators of inorganic salt levels. As shown in Table 3.2-1, TDS, chloride, and sulfate concentrations in native groundwater are higher than in current water supplies in the project area but are within the recommended levels defined by secondary drinking water standards.

3.2.2.4 Existing Drinking Water Quality Regulations

The federal government has assigned primary responsibility for administration and enforcement of federal drinking water regulations to the states. The California Department of Health Services (DHS) issues a domestic water supply permit to EBMUD (most recently in March 1998) that defines the conditions under which EBMUD must operate its water supply system, including MCLs, monitoring and reporting requirements, acceptable treatment processes, and allowable water supply sources.

Maximum Contaminant Levels and Public Health Goals

Key regulations governing EBMUD are outlined in Title 22, Division 4, Chapter 15 of the California Code of Regulations, entitled Domestic Water Quality and Monitoring. This regulation stipulates MCLs for chemicals and microorganisms that are not to be exceeded in drinking water supplied to the public. These MCLs, which cover 86 constituents in water, are listed in Table 3.2-2. Primary MCLs are health based. Secondary MCLs are related to the aesthetic qualities of water, such as taste and appearance.

TABLE 3.2-2
Maximum Contaminant Levels for Drinking Water in California

Primary Standards (Health Related)			Primary Standards (Health Related)		
Water Quality Parameter	**MCL**	**Units**	**Water Quality Parameter**	**MCL**	**Units**
Inorganic Chemicals			**Nonvolatile Synthetic Organic Chemicals**		
Aluminum (Al)	1,000	ppb	Alachlor (Alanex)	2	ppb
Antimony (Sb)	6	ppb	Atrazine (Aatrex)	3	ppb
Arsenic (As)	10	ppb	Bentazon (Basagran)	18	ppb
Asbestos	7	mf/L	Benzo(a)pyrene	0.2	ppb
Barium (Ba)	1,000	ppb	Carbofuran	18	ppb
Beryllium (Be)	4	ppb	Chlordane	0.1	ppb
Cadmium (Cd)	5	ppb	2,4-D	70	ppb
Chromium (Cr)	50	ppb	Dalapon	200	ppb
Cyanide (CN)	200	ppb	Dibromochloropropane (DBCP)	0.2	ppb
Fluoride (F)	2	ppm	Di(2-ethylhexyl) adipate	400	ppb
Mercury (Hg)	2	ppb	Di(2-ethylhexyl) phthalate	4	ppb
Nickel (Ni)	100	ppb	Dinoseb (DNBP)	7	ppb
Nitrate (as NO3)	45	ppb	Diquat	20	ppb
Nitrate+Nitrite as N	10	ppm	Endothall	100	ppb
Nitrite (as N)	1	ppm	Endrin	2	ppb
Selenium (Se)	50	ppb	Ethylene Dibromide (EDB)	0.05	ppb
Thallium (Tl)	2	ppb	Glyphosate	700	ppb
Volatile Organic Chemicals (VOCs)			Heptachlor	0.01	ppb
Benzene	1	ppb	Heptachlor Epoxide	0.01	ppb
Carbon Tetrachloride	0.5	ppb	Hexachlorobenzene	1	ppb
1,2-Dichlorobenzene	600	ppb	Hexachlorocyclopentadiene	50	ppb
1,4-Dichlorobenzene	5	ppb	Lindane	0.2	ppb
1,1-Dichloroethane (1,1-DCA)	5	ppb	Methoxychlor	40	ppb
1,2-Dichloroethane (1,2-DCA)	0.5	ppb	Molinate	20	ppb
Dichloroethylene (1,1-DCE)	6	ppb	Oxamyl (Vydate)	200	ppb
cis-1,2-Dichloroethylene (1,2-DCE)	6	ppb	Pentachlorophenol (PCP)	1	ppb
Trans-1,2-Dichloroethylene (T-1,2-DCE)	10	ppb	Picloram	500	ppb
Dichloromethane (Methylene Chloride)	5	ppb	Polychlorinated Biphenyls (PCBs)	0.5	ppb
1,2-Dichloropropane	5	ppb	Simazine	4	ppb
1,3-Dichloropropane	0.5	ppb	Thiobencarb	70	ppb
Methyl-tert-butyl ether (MTBE)	13	ppb	Toxaphene	3	ppb
Ethylbenzene	700	ppb	2,3,7,8-TCDD (Dioxin)	0.00003	ppb
Monochlorobezene	70	ppb	2,4,5-TP (Silvex)	50	ppb
Styrene	100	ppb	**Secondary Standards (Aesthetics)**		
1,1,2,2-Tetrachloroethane	1	ppb	Aluminum	0.2	ppm
Tetrachloroethene (PCE)	5	ppb	Chloride *	500-600	ppm
Toluene	150	ppb	Color	15	units
1,2,4-Trichlorobenzene	70	ppb	Conductivity *	1,600-2,200	umhos/cm
1,1,1-Trichloroethane (1,1,1-TCA)	200	ppb	Copper	1,000	ppb
1,1,2-Trichloroethane (1,1,2-TCA)	5	ppb	Iron	300	ppb
Trichloroethylene (TCE)	5	ppb	Manganese	50	ppm
Trihalomethanes	80	ppb	MBAS	0.5	ppm
Haloacetic Acids	60	ppb	Silver	100	ppb
Freon 11	150	ppb	Sulfate *****	500-600	ppm
Freon 113	1,200	ppb	Thiobencarb	1	ppb
Vinyl Chloride	0.5	ppb	Threshold Odor Number	3	TON
Xylenes (Total)	1,750	ppb	Total Dissolved Solids *****	1,000-1,500	ppm

TABLE 3.2-2
Maximum Contaminant Levels for Drinking Water in California

Primary Standards (Health Related)			Primary Standards (Health Related)		
Water Quality Parameter	**MCL**	**Units**	**Water Quality Parameter**	**MCL**	**Units**
Inorganic Chemicals			**Nonvolatile Synthetic Organic Chemicals**		
			Turbidity	5	NTU
			Zinc	5,000	ppb

Notes:
* Range represents upper and short-term MCL
ppb: Parts per billion
ppm: Parts per million
mf/L: Million fibers per liter
umhos/cm: Micromhos per centimeter
NTU: Nephelometric Turbidity Unit
MCL: maximum containment level

Drinking Water Source Assessment and Protection Program

Drinking water source assessment, which is an evaluation of existing and potential threats to the quality of the public drinking water, is the first step in the development of a complete drinking water source protection program. This assessment, stemming from the Safe Drinking Water Act Amendments of 1996, is required before the DHS will grant a water supply permit for a new source of supply, such as that proposed from the Bayside Groundwater Project. The assessment includes the following elements:

- Delineation of the area around a drinking water source through which contaminants might move and reach that drinking water supply,
- An inventory of possible contaminating activities (PCAs) that might lead to the release of microbiological or chemical contaminants within the delineated area, and
- Determination of the PCAs to which the drinking water source is most vulnerable.

The Division of Drinking Water and Environmental Management of DHS is the lead agency for developing and implementing the Drinking Water Source Assessment and Protection (DWSAP) Program. EBMUD would conduct a detailed DWSAP assessment for the Proposed Project before applying for a revision to its drinking water supply permit.

Radionuclides Rule

In December 2000, the U.S. EPA promulgated the final Radionuclides Rule. This rule retained the existing MCLs for radium, gross alpha particle radioactivity, and beta particle and photon activity and established an MCL for uranium for the first time. New monitoring requirements were also established by the rule.

Lead and Copper Rule

In 1992, the U.S. EPA adopted the Lead and Copper Rule for drinking water. The presence of lead or copper in tap water is primarily a result of corrosion of plumbing system components within buildings. The rule sets action levels for lead and copper in standing samples collected from faucets with the highest risk for elevated lead and copper levels. To control corrosion that could release lead and copper, EBMUD must ensure that the pH of water in its distribution system is maintained in the range that minimizes lead and copper corrosion in distribution and customer piping. To this end, EBMUD’s water supply permit issued by the DHS requires that the pH of water in the distribution system be greater than 8.0.

Stage 1 Disinfectants and Disinfection By-Products Rule

Stage 1 of the Disinfectants and Disinfection By-Products Rule includes MCLs of 80 parts per billion (ppb) and 60 ppb for trihalomethanes and haloacetic acids, respectively, based on an annual average of system-wide measurements. The Stage 1 rule was announced in December 1998, and as of January 2004 groundwater systems are required to comply with MCLs and routine monitoring requirements.

3.2.2.5 Anticipated Drinking Water Regulations

As a result of the regulatory activities initiated by the 1996 Safe Drinking Water Act Amendments, a number of regulations are being introduced and/or being reexamined. To strengthen the scientific basis of risk assessment information and of the approach being used to establish MCLs, additional time is required for development and promulgation. The following discussion focuses on anticipated regulations likely to affect the Proposed Project.

Groundwater Rule

According to the U.S. EPA, the Groundwater Rule (GWR) specifies the appropriate use of disinfection in groundwater and establishes multiple barriers to protect against bacteria and viruses in drinking water from groundwater sources. The GWR was scheduled to be issued as a final regulation in Spring 2003; however, no final action had been taken at the time this DEIR was published.

Radon Regulation

Radon most commonly occurs in the air but can be found dissolved in water, particularly groundwater. The regulation of radon in drinking water was separated from the regulation pertaining to other radionuclides because radon in indoor air rather than in water is the key public health concern. A proposed regulation for radon in drinking water was published in November 1999. Final promulgation of the radon regulation is anticipated no earlier than December 2005.

According to the proposed regulation, if the source-water radon concentration is less than 300 picocuries per liter (pCi/L), then the water will not need to be treated. When water concentrations are higher than this level, up to 4,000 pCi/L, a water system operator would have the option to treat the water to remove radon or to participate in a state multimedia mitigation program to educate the public about radon exposure from indoor air and the steps that can be taken to reduce exposure.

When promulgated, the standard is likely to be higher than radon concentrations at Bayside. Because there is no existing standard, no treatment for radon in groundwater is proposed for Phase 1. If a radon standard is established that is unexpectedly below radon levels in Bayside groundwater, treatment options for radon will be identified at that time.

Stage 2 Disinfectants and Disinfection By-Products Rule

The U.S. EPA issued the proposed Stage 2 Disinfectants and Disinfection By-Products Rule (DDBR) in August 2003 and received public comment on the rule through January 2004. The anticipated promulgation date had not been announced by the U.S. EPA at the time this DEIR was published. The Stage 2 DDPR is designed to reduce peak disinfectant by-product (DBP) concentrations, in part by changing Stage 1 DBPR compliance monitoring locations. To identify these new monitoring locations, an Initial Distribution System Evaluation must be performed. The rule does not change the MCLs for trihalomethanes and haloacetic acids but alters the method for determining compliance.

Sulfate Regulation

The proposed primary MCL of 500 parts per million (ppm) for sulfate in drinking water supplies was published in December 1994. In the 1996 amendments to the Safe Drinking Water Act (SDWA), Congress mandated that the U.S. EPA determine, by August 2001, whether to regulate sulfate in drinking water. The SDWA requires that if the U.S. EPA decides to regulate sulfate, the Agency must propose the MCL by August 2003 and issue a final standard by February 2005.

Because sulfate is considered a low public health priority, further development of this regulation was postponed. There is already a secondary MCL for sulfate, based on aesthetic (not health-based) considerations. The secondary MCL for sulfate is a range, with 250 ppm recommended, 500 ppm set as an upper limit, and 600 ppm allowable for short-term exposure. As of the publication of this DEIR, the U.S. EPA had not made a determination to regulate sulfate but was reviewing, in addition to the dose-response data from a sulfate study, several applicable risk management factors, including, but not limited to occurrence data on concentrations of sulfate in public water systems; information relative to treatment technologies (particularly, technologies applicable to small public water systems); availability and costs of analytical methods for sulfate; and overall costs and benefits attributable to any likely rule.

Drinking Water Candidate Contaminant List

In 1998, the U.S. EPA published a list of 50 chemical and 10 microbiological contaminants being considered for future regulation. On April 2, 2004 the EPA announced its preliminary decision to carry over 51 contaminants (nine microbiological and 42 chemical contaminants or contaminant groups) for the next list. This will allow the EPA to continue with research and data collection activities related to the list, prepare to make regulatory determinations in the 2006 time frame using the data collected from these activities, and focus resources on completing ongoing work with the National Drinking Water Advisory Council (NDWAC) on an expanded process for classifying drinking water contaminants in the future.

3.2.3 Project Water Quality Goals and Pilot Testing

The following subsections describe the water quality goals and testing for Phase 1 of the Proposed Project.

3.2.3.1 Phase 1 Water Quality Goals

In consideration of current regulations governing public water supplies, water quality goals were developed for the water to be delivered from operation of Phase 1. An overall goal of Phase 1 is to meet the most stringent existing water quality standards with a margin of safety. The goal for manganese, the water quality constituent of concern, is presented in Table 3.2-3. Manganese is a constituent of concern because its concentration in native groundwater exceeds current drinking water standards.

Water quality goals for pH, chloramine, and fluoride are to match levels currently present in the local distribution system, to ensure that this new water supply is compatible with EBMUD's other supplies. The pH in the distribution system is approximately 8.4. The chloramine concentration in the distribution system is between 1.0 and 2.0 milligrams per liter (mg/L), expressed as total chlorine. In accordance with the requirements of EBMUD's water supply permit issued by California DHS, the fluoride concentration in water is between 0.8 and 1.4 mg/L for West of Hills customers.

TABLE 3.2-3
Water Quality Goals for Constituents of Concern

Compound	Treatment Goal	Maximum Contaminant Level	Safety Factor
Manganese	15 ppb	50 ppb	3.3

There are no specific goals for water quality constituents not discussed above. Salinity of the water would not change from the levels found in recovered groundwater. The quality of extracted groundwater can be improved either by injecting treated District water into the aquifer during wet years or by treating the extracted water. Injection improves water quality by displacing native groundwater or by diluting constituents of concern. Treatment improves water quality by removing constituents of concern or by adding chemicals that make the water less corrosive or more healthful.

The District has been conducting pilot tests to demonstrate the performance of injection and of treatment, to refine design criteria, and to develop operating requirements for full-scale facilities. The results of these tests are described in the following sections.

3.2.3.2 Injection and Extraction Testing

The quality of the extracted groundwater can be improved by injecting high quality treated water from EBMUD's distribution system into the aquifers during wet years and later recovering that water. Three cycles of injection, storage, and recovery were performed at the District's Bayside Project test well between November 1998 and July 1999 to test this approach. To date, more than 200 million gallons of treated water have been injected from the distribution system into the aquifer.

After three cycles of injection, storage, and recovery, it was demonstrated that storing high quality treated water improves the water quality for all constituents. Table 3.2-1 compares relevant water quality constituents of EBMUD distribution system water, native groundwater, recovered water, and the corresponding primary and secondary drinking water standards.

The quality of extracted water gradually changes during the course of the extraction cycle. Initially, the quality of the extracted water is very similar to that of the injected water. As extraction proceeds, the proportion of native groundwater in the extracted water increases. Figure 3.2-3 shows this phenomenon. Native groundwater and injected groundwater mix in the aquifer; the degree of mixing may be reduced when greater volumes are injected.

Disinfection By-products Formation. Water quality samples collected during the injection and extraction test cycles were used to evaluate the presence of DBPs in the injected potable drinking water and extracted groundwater and assess the potential long-term effect of injection, storage, and recovery cycles on local groundwater quality.

DBPs are formed by a reaction between dissolved organic carbon (DOC) naturally present in water and chlorine added to drinking water for disinfection purposes. Trihalomethanes (THMs) are the most common form of DBPs produced during disinfection and consist of the following compounds: chloroform ($CHCl_3$), bromodichloromethane ($CHCl_2Br$), dibromochloromethane ($CHCLBr_2$), and bromoform ($CHBr_3$). The U.S. EPA regulates concentrations of THMs in drinking water and has established an MCL for THMs of 80 micrograms per liter (μg/L). During each test cycle, water samples were collected from the demonstration aquifer storage and recovery well, a 6-inch test well, and an observation well and analyzed for the different THM compounds. The test well and observation well are located 200 and 45 feet, respectively, from the demonstration well.

Results of sampling indicate chloroform is the dominant THM compound present in the injected water and extracted groundwater. Concentrations of chloroform in the injected water ranged from 38 to 71 μg/L and made up about 93 percent of total THMs, which is reflective of low bromine concentrations in the treated potable drinking water used for injection. Chloroform data for the test cycles are summarized in Figure 3.2-4. As shown in this figure, concentrations of chloroform tend to remain stable in the subsurface environment during periods of storage. THM concentration trends parallel those of chloride, which is a conservative (non-reactive) constituent. Thus, it appears that there is no degradation or formation of chloroform during subsurface storage. Concentrations of chloroform were observed to decline in recovered water during the extraction period. It appears that mixing of injected water with groundwater during extraction is the primary process affecting the concentration of THMs at the test well.

3.2.3.3 Groundwater Treatment Pilot Testing

The quality of extracted groundwater can be improved by treatment following extraction. From October 2000 through January 2001, EBMUD conducted a groundwater treatment pilot test for manganese using groundwater from the SEBPB aquifer. The pilot test was conducted at a site less than 2 miles from the project area. The groundwater quality is similar at both sites, and the aquifers are hydraulically connected. Relative to the proposed Bayside project, the key objectives of the groundwater treatment pilot test were to demonstrate the treatment effectiveness for the removal of manganese and to establish design criteria and operational requirements for the treatment system.

Manganese Treatment Technology. Existing research studies, process information from vendors, and prior experience of other utilities were considered in selecting the manganese treatment technology. Based on the findings of this evaluation, a catalytic media filtration system is recommended for treatment. Filtration is the most practical and commonly used treatment process for removing manganese. It is widely used in California and other parts of the United States and is a simple, proven technology requiring relatively low capital and operations expenditures. The technology not only removes manganese but may reduce iron and arsenic concentrations as well.

Pilot Test Findings. Based on the tests performed to date, the pilot system successfully treated the native groundwater in the Deep Aquifer to meet water quality goals for manganese; manganese was removed from the native groundwater to nondetectable levels. In more than two months of pilot testing, manganese concentrations in the pilot plant effluent averaged 0.9 ppb and never exceeded 2.5 ppb, well below the treatment goal of 15 ppb.

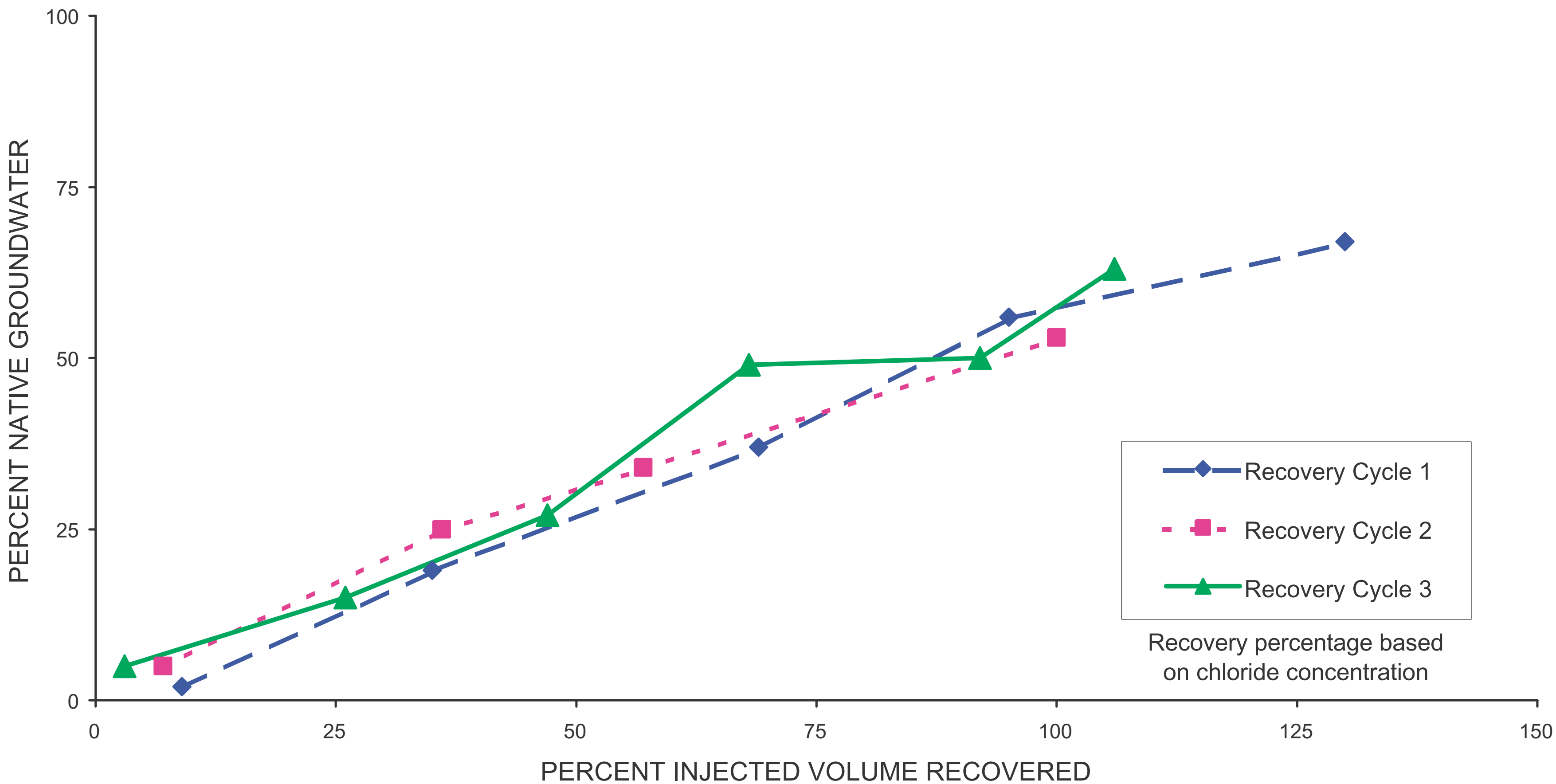

FIGURE 3.2-3
PILOT TEST RECOVERY CURVES
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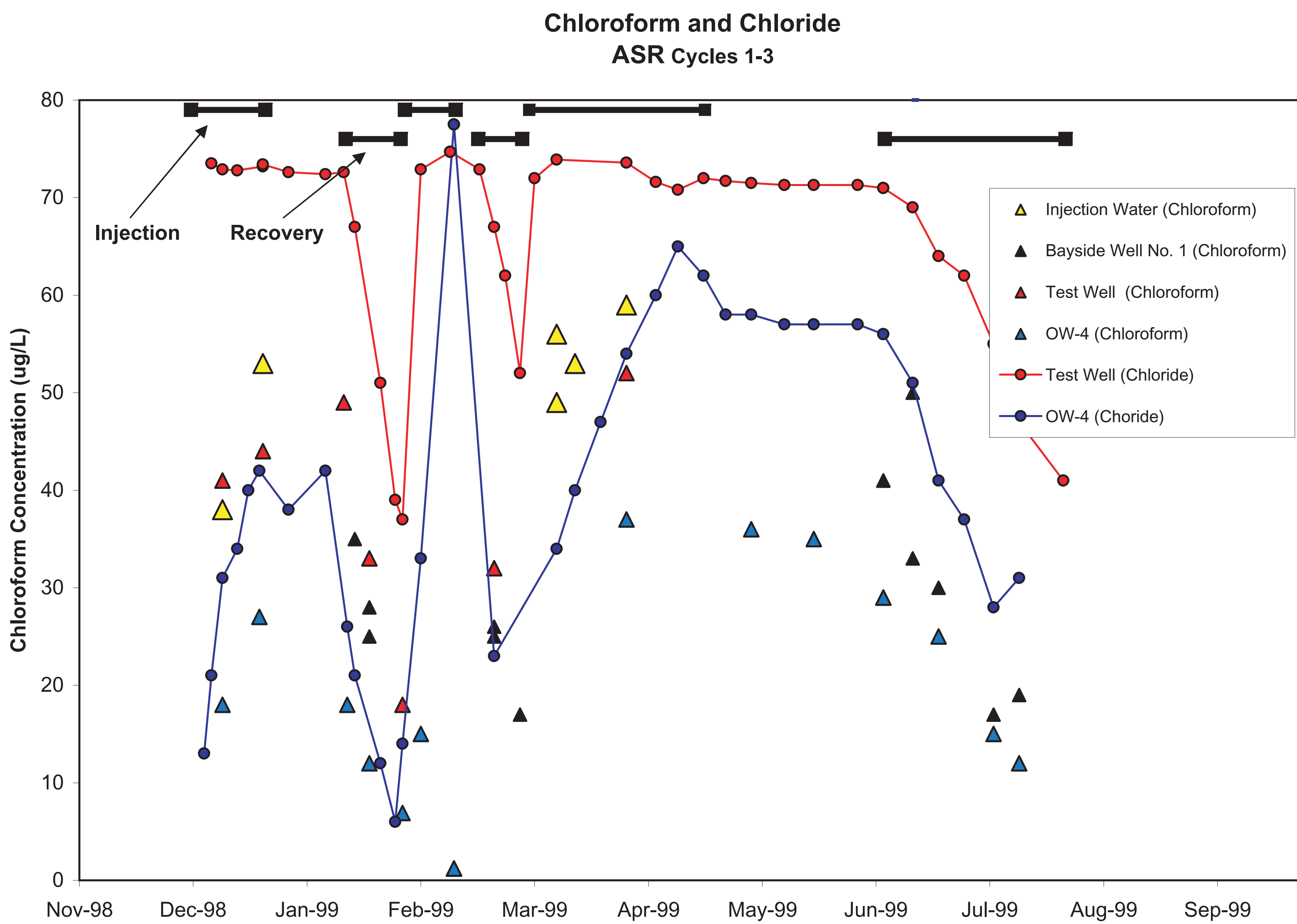

Chloroform v2.xls

FIGURE 3.2-4
TEST CYCLES-CHLOROFORM AND CHLORIDE DATA
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BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

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169710.26.ZZ_Fig 3.2-4 _1/28/05_ccc_SFO

One phase of the pilot treatment tested the reclamation of filter backwash water because the manganese removal filters had to be backwashed several times each day to remove accumulated solids, and direct discharge of backwash water to the sanitary sewer would be costly and would waste water that could be used to relieve drought conditions. Therefore, a test was conducted to determine whether a portion of backwash water could be treated and recycled without adversely affecting the turbidity and manganese levels in the main process stream. The test showed that backwash water could be successfully recycled; there was no noticeable increase in product water turbidity after recycling, and the final manganese concentration was well below the treatment goal of 15 ppb.

Chlorine Addition. One phase of the injection and extraction well testing described above involved adding chlorine to existing treated District water before directing the water to the pilot well for injection. The test was conducted to determine whether this practice could extend the time before backflushing of the well became necessary. Evidence of improved injection performance was noted; however, unintentional water quality changes were also observed. Higher concentrations of DBPs (primarily chloroform) were measured in the groundwater after injection of the chlorinated water although this increase did not violate current drinking water standards. Because of uncertainty in compliance with future disinfection by-products regulations, chlorine addition prior to injection is not proposed for this project.

3.2.4 Significance Criteria and Impact Analysis Methodology

Consistent with CEQA Guidelines Appendix G a project would normally have a significant impact on water quality, treatment, and distribution if:

- Current or anticipated primary or secondary MCLs would be exceeded,
- Adequate level of service including for fire flow and daily domestic demands could not be maintained.

3.2.5 Effects Found to be Not Significant

The following impacts were considered but were found to be insignificant or not applicable to Phase 1 of the Project; therefore, there is no further discussion of these impacts.

Health-related Effects. Health-related effects from the introduction of a new water source were found not to be significant for Phase 1. Sampling of native and recovered injection water showed that the concentration of only a few chemical constituents might increase as a result of Phase 1 operation but would still remain well below their MCLs, as shown in Table 3.2-1.

The concentrations of organic chemicals in extracted groundwater were found to be even lower than in EBMUD’s current delivered water. The concentration of DBPs in recovered groundwater is also expected to be lower than in the water currently delivered to customers in the vicinity of Phase 1. This expectation has been demonstrated in the test results, which show a decline in chloroform concentrations of recovered water during extraction because as injected water is extracted it mixes with native groundwater, which does not contain DBPs. Pathogens and microorganisms associated with fecal contamination have not been detected in groundwater extracted from the Deep Aquifer. This result was expected because the aquifer is well isolated from potential contamination, and the soil acts as a filter to prevent underground movement of these organisms.

Overall, the quality of water delivered to customers from operation of Phase 1 of the Project would cause no adverse health effects, given that no primary MCLs would be exceeded.

Aesthetic effects. Groundwater delivered to customers would meet all secondary (aesthetic) standards. Aesthetic standards are non-mandatory water quality standards set by the U.S. EPA for 15 contaminants. The EPA does not enforce these secondary MCLs.; they are established only as guidelines to assist public water systems in managing their drinking water for aesthetic considerations, such as taste, color and odor. These contaminants are not considered to present a risk to human health at the secondary MCL.

Water service and fire flow effects. Results of system modeling for Phase 1 indicate that the existing level of service could be maintained when the project is operating. A water pressure change may result when the project is operating. However, this change in pressure is within the range that would normally result from the rise and fall of water levels in the reservoirs serving the area.

Higher levels of dissolved solids, hardness, and alkalinity in water that could affect industrial or commercial businesses served by the District. EBMUD water delivered to customers would meet all primary and aesthetic water quality standards. However, substantial changes in certain water constituent levels have the potential to affect cooling operations, boiler feed, and industrial processes. To address such changes, the District will utilize its notification system to alert sensitive businesses of these changes to provide lead time for process adjustments.

3.2.6 Impacts and Mitigation Measures

Water quality, treatment, and distribution impacts and mitigation measures for Phase 1 are described below.

Phase 1 Potential Impact 3.2-1. Potential drawing of contamination into the water supply through pumping

Section 3.7.2.1 of this EIR describes the investigative methods used to detect the presence of chemical compounds such as gasoline leaked from underground fuel tanks in the aquifer affected by Phase 1 operation. Figures 3.7-2 through 3.7-6 depict the locations of regional groundwater contaminant plumes identified by the State Water Resources Control Board. It should be noted that the nearest regional plume is more than 2 miles away from the project site. Moreover, all of these plumes are within the shallow Newark aquifer equivalent zone (30 to 130 feet below ground surface), as described in Section 3.1.2.1 of this EIR. The deepest known contamination in the SEBPB aquifer is located approximately 7 miles north of the project site at a depth of approximately 300 feet below ground surface.

As previously described, Bayside Project operation would draw from the *Deep Aquifer* zone which is approximately 500 to 650 feet below ground surface near the Bayside Project site. Because of the naturally slow movement of groundwater (only a few feet or a fraction of foot in a year), contaminants do not mix or spread quickly. Moreover, because of variations in aquifer material, hydraulic gradient, thickness, porosity and hydraulic conductivity, the flow paths of contaminants is not a straight line; thus, their actual travel time could be longer than those approximated times which assume homogeneous aquifer properties.

Water age is a reliable indicator of the degree of separation between the shallower and deeper aquifer layers. The USGS determined that the 9,000 year age of the deep aquifer supply in the SEBPB aquifer is significantly older than that of the more recent shallow zone waters. These differences indicate that the zones are firmly separated, and that there has been no measurable interaction between those aquifers during historic stress periods when deep zone water levels reached historic lows.

Bayside Well No. 1 would be screened in the Deep Aquifer only. Contaminants from the shallower aquifer could migrate to the Deep Aquifer through vertical conduits such as old wells that are screened in more than one aquifer. Upon reaching the Deep Aquifer the contaminants could migrate laterally toward the project location if the direction and gradient of flow are sufficient to cause such movement. However, injection may cause any such flow to reverse.

Mitigation Measure 3.2-1a. Using information generated under Mitigation Measures 3.1-3a, b and c, work with parties responsible for contamination and owners of deep wells within 200 feet of known contaminant plumes to destroy those wells or retrofit them if they remain active.

Mitigation Measure 3.2-1b. As part of the Bayside Groundwater Project monitoring program described in Section 2.4.3.1 of this DEIR, annually collect and test water quality samples from multiple monitoring wells screened in specific aquifers for contaminants known to exist in the SEBPB aquifer. This will provide an early warning system in the event contaminants move into the Deep Aquifer.

Mitigation Measure 3.2-1c. Monitor water quality in the Phase 1 production well and implement a wellhead protection program as required by the Department of Health Services.

Impact Significance: Less than significant after mitigation

3.2.7 References – Water Quality, Treatment, and Distribution

California Code of Regulations. 2004. Title 14. Chapter 3: "Guidelines for Implementing the California Environmental Quality Act."

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EBMUD. 2000. *Groundwater Treatment Pilot Test – Interim Report,* November.

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Pavelic, P., P. Dillon, and Brenton Nicholson. 2003. Water Quality Improvements During Aquifer Storage and Recovery, in American Water Works Association Research Foundation Project 2618, vol. 1: Water Quality Improvement Processes.

Science Applications International Corporation. 1999. *Technologies and Costs for the Removal of Radon from Drinking Water*, U.S. EPA Contract No. 68-C6-0059. May.

U.S. Environmental Protection Agency (U.S. EPA). 1999. *Radon in Drinking Water: Questions and Answers*, U.S. EPA 815-F-007. October.

_____. 1998. Final Drinking Water Contaminant Candidate List. 63 Code of Federal Regulations 10273. *Federal Register*, March 2.

3.3 Phase 1 Surface Water Hydrology and Quality

The subsections below describe impacts and mitigation measures related to surface water hydrology and quality for Phase 1 of the project.

3.3.1 Approach to Analysis

This section describes the existing setting for surface water hydrology and water quality for the project, based on available information from published and unpublished reports and public agency staff. This section also identifies impacts that could result from project construction and operation and describes mitigation measures to reduce potential impacts.

3.3.2 Setting

The subsections below describe the elements of the project setting related to surface water hydrology and quality: climate; surface water, drainage and flooding; and the applicable regulatory framework.

3.3.2.1 Climate

The climate of the San Leandro and San Lorenzo area is characterized as dry summer subtropical (often referred to as "Mediterranean"), with cool wet winters and relatively warmer, dry summers. The mean annual rainfall in the vicinity for the period between 1948 and 2004 was approximately 18 inches, based on data for the Oakland Airport (Western Regional Climate Center 2004).

3.3.2.2 Surface Water, Drainage, and Flooding

This subsection describes surface water features and storm drainage and flooding issues related to the project.

Surface Water Features. The surface water features nearest to the site for Phase 1 (Figure 2-2) are:

- Bockman Canal approximately 1,000 feet to the south,
- San Lorenzo Creek approximately 2,000 feet to the north, and
- San Francisco Bay approximately 1,000 feet to the west.

Bockman Canal System. The Bockman Canal System is entirely contained within an engineered channel and receives inflow from several underground storm drain systems (Sowers 1997). A series of gates has been installed in the lower reaches to control backflushing from tidal action. The Flooding subsection further describes Bockman Canal.

San Lorenzo Creek. From its headwaters in the hills to the east of Castro Valley to Foothill Boulevard in Hayward, the San Lorenzo Creek is primarily contained within its natural channel except at the Don Castro Reservoir, which was built by the Alameda County Flood Control and Water Conservation District (ACFCWCD) as a flood control measure. A short portion of this segment of the creek, adjacent to Highway 580, is contained within an underground culvert. Downstream of Foothill Boulevard, the creek is contained in engineered channels. This lower portion of the creek receives runoff from several underground culverted streams or storm drain systems.

San Francisco Bay Ambient Water Quality. Year 2001 data from the Alameda Regional Monitoring Program sampling station for the San Francisco Estuary indicate that water quality conditions remain within the objectives established by the RWQCB with the exception of polychlorinated biphenyls (PCBs). (SFEI 2003).

Storm Drainage. The Phase 1 site is currently unpaved. Stormwater from this area is collected in the onsite storm drain system and discharged through a catch basin into a man-made drainage channel that flows into Bockman Canal and ultimately into the Bay.

Flooding. The Bockman Canal system was constructed by ACFCWCD to drain portions of San Leandro. The canal consists of trapezoidal earth and concrete channels. Flooding in Bockman Canal results primarily from high tides in San Francisco Bay. Where Bockman Canal enters the San Francisco Bay, the height of the 100- and 500-year tides are 7.1 and 7.4 feet, respectively, based on the National Geodetic Vertical Datum of 1929. (EBMUD 2002).

Flood control improvements that protect the cities of Hayward and San Lorenzo include concrete channels, riprap-lined channels, graded-earth channels, and levee sections. The design capacities of the channel are 9,200 cubic feet per second (cfs) above Castro Valley Creek, and 10,000 cfs from Castro Valley Creek to the San Francisco Bay (EBMUD 2002).

Flood Insurance Rate Maps (FEMA 2000a, 2000b) indicate that the Phase 1 project site would be located within a 500-year flood hazard zone (Figure 3.3-1). However, ACFCWCD does not have specific requirements for construction within this zone.

3.3.2.3 Regulatory Framework

This subsection describes regulatory documents and agencies relevant to Phase 1.

Water Quality. The federal Clean Water Act of 1972 requires the U.S. EPA to develop, publish, and periodically update ambient water quality criteria for the protection of human health. Division 7 of the California Water Code establishes the authority of the State Water Resources Control Board (SWRCB) and nine regional boards. The Phase 1 project site is under the jurisdiction of the San Francisco Bay Regional Water Quality Control Board (RWQCB) that implements the Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan). The Basin Plan (RWQCB 1995, as amended) identifies existing and potential beneficial uses for surface and groundwater within the region and water quality objectives designed to protect those uses.

NPDES Discharge Regulations. The federal Clean Water Act also established the National Pollutant Discharge Elimination System (NPDES) permit system that specifies discharge prohibitions, effluent limitations, and other provisions (such as monitoring programs) to protect water quality. The RWQCB is responsible for local implementation and enforcement of the NPDES program.

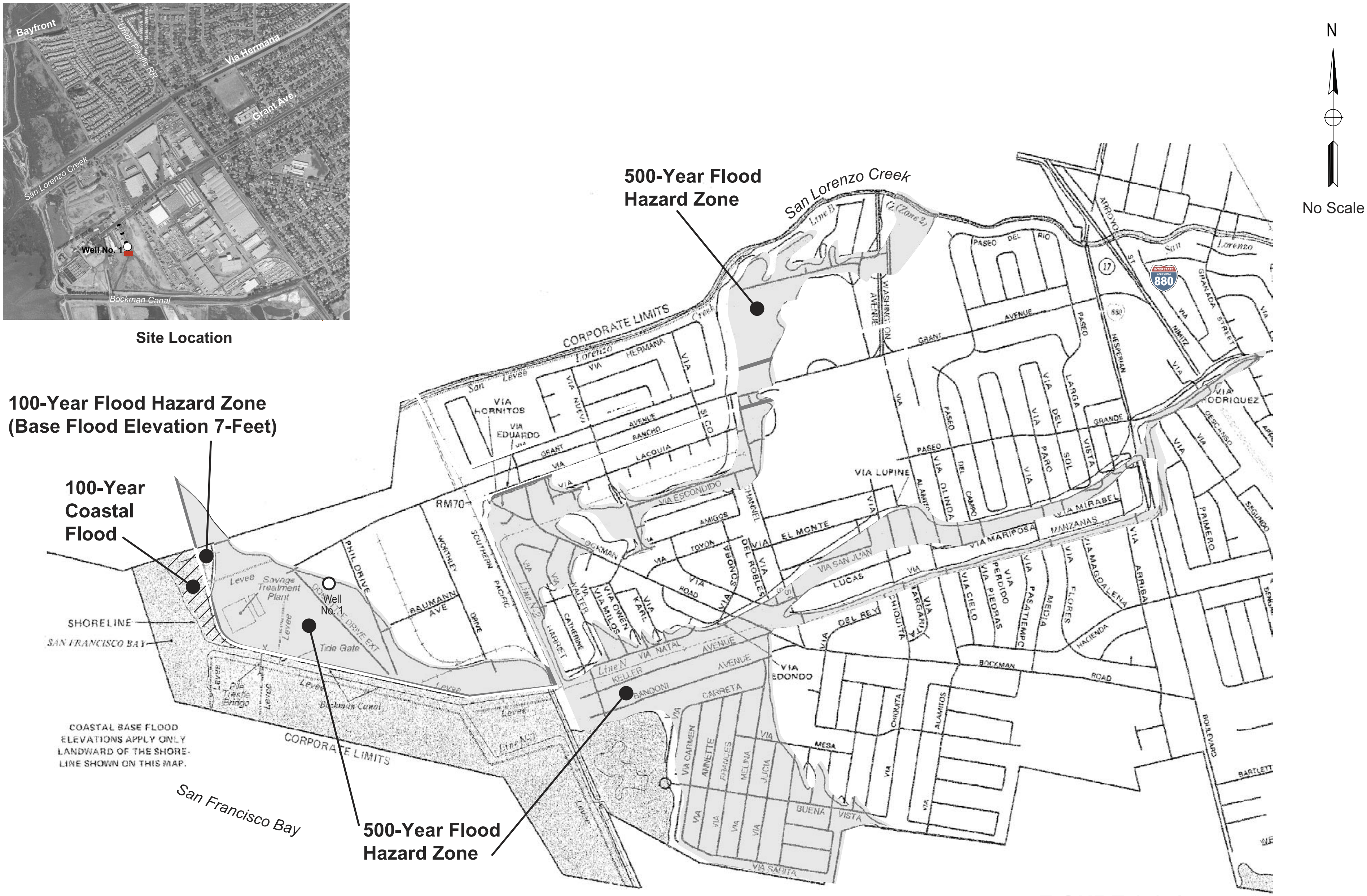

FIGURE 3.3-1
100-YEAR AND 500-YEAR FLOOD HAZARD ZONES

EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

Source: FEMA, 2000a, b

CH2MHILL

Phase 1 is under the jurisdiction of the Alameda Countywide Clean Water Program. Because Phase 1 facilities would involve less than 10,000 square feet of impervious surfaces, features to reduce the pollutant load in stormwater discharges and to manage runoff flows would not be required (ACCWP 2004). Stormwater from Phase 1 of the project would drain into an existing catch basin, which would filter stormwater in compliance with the countywide NPDES. Because the area of disturbance for construction of Phase 1 is less than 1 acre, EBMUD would not need to obtain authorization to discharge under the Construction General Permit.

As discussed in Section 2.0, during operation of Phase 1, backflush water would be discharged to the storm drain system in compliance with Alameda County's existing NPDES permit.

3.3.3 Significance Criteria

Significance criteria provided in the CEQA Guidelines, Appendix G for Hydrology and Water Quality apply to surface water and groundwater. For this DEIR, surface water and groundwater are discussed in separate sections. The significance criteria that apply to surface water are listed below. The CEQA hydrology and water quality significance criteria that apply to groundwater are identified in Section 3.1, Groundwater Hydrology and Quality. Impacts related to inundation by seiche, tsunami, or mudflow are discussed in Section 3.5, Geology Soils, and Seismicity.

Consistent with CEQA Guidelines Appendix G, a project would normally have a significant impact on surface water hydrology or quality if it would:

- Violate any water quality standards or waste discharge requirements;
- Substantially alter existing drainage patterns in a manner that would result in substantial erosion or siltation, on or off the Phase 1 site;
- Substantially alter the existing drainage patterns or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off the Phase 1 site;
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- Substantially degrade water quality;
- Place housing in the 100-year flood hazard area;
- Place structures within a 100-year flood hazard area that would impede or redirect flood flows; or
- Expose people or structures to a significant risk associated with flooding.

Potential impacts related to surface water hydrology and quality were assessed by evaluating known conditions within the Phase 1 project area and project construction and operation activities against the significance criteria stated above.

3.3.4 Effects Found to be Not Significant

The following impacts were considered but were found to be not significant or not applicable to Phase 1 of the project; therefore, there is no further discussion of these impacts.

- The construction of the Phase 1 facilities would not result in significant impacts associated with flooding hazards. Therefore, there is no discussion of flooding impacts because Phase 1 would not alter drainage patterns in a manner that would result in flooding on or off the Phase 1 site; does not include housing that would be placed in a 100-year flood hazard zone; would not locate facilities within a 100-year flood hazard area or impede or redirect flood flows; and would not expose people or structures to a significant risk associated with flooding.
- Phase 1 of the project would involve the creation of approximately 12,000 to 15,000 square feet (approximately 0.3 acres) of new impervious surfaces. This is a minor increase in impervious surface area, and existing stormwater facilities have adequate capacity to accommodate the associated minor increase in runoff. As described above, stormwater runoff from the Phase 1 site would flow into an existing catch basin, which would filter sediments from the runoff. No significant impacts from the increase in impervious surface would occur, so this issue is not discussed further below.
- Operation of Phase 1 of the project would require backflushing of Bayside Well No. 1 on a regular basis during injection. Backflush water would be discharged to the existing storm drain system. Groundwater withdrawn during the startup phase may also be discharged to the storm drain system. To avoid an increase the risk of flooding in Bockman Canal, backflush operations and startup phase discharges would be avoided during significant rain or flooding events.

3.3.5 Impacts and Mitigation Measures

Phase 1 Potential Impact 3.3-1. Potential stormwater-related erosion, sedimentation, and transport of fuels, oils, or grease to surface waters

Construction of Phase 1 of the project would disturb soil during drilling for the extensometer field, construction of the wellhead treatment facility, and installation of the pipeline that connects Bayside Well No. 1 to the water distribution main. Construction activities would result in disturbance of approximately 0.6 acres of currently undeveloped land. Soil stockpiles and excavation and grading activities during construction could expose soil to stormwater runoff and could cause erosion and entrainment of sediment in the runoff. If not managed properly, the runoff could cause increased sedimentation in storm sewers or drainages. The accumulation of sediment in culverts or drainages could block flows, potentially resulting in increased localized ponding or flooding. Wind erosion could also deposit sediment in culverts or drainages.

Installation of the monitoring wells by mud rotary (also referred to as rotary wash) methods would require the use of drilling mud (a mixture of water and clay) to keep the borehole open and return the drill cuttings to the surface. Release of drilling mud to the storm drainage system could introduce fine sediments into Bockman Canal.

In addition, construction equipment, drill rigs, and support equipment could leak petroleum hydrocarbons such as hydraulic oils and fuel that could contaminate soil and subsequently contaminate stormwater if rainwater comes into contact with the contaminated soil.

Mitigation Measure 3.3-1. Implement Best Management Practices (BMPs) designed to reduce contact between exposed soil and rainfall, minimize erosion of exposed soil, and minimize the contact of construction materials, equipment, and maintenance supplies (e.g., fuels, lubricants, paints, solvents, and adhesives) with stormwater. BMPs may include, but are not limited to, the use of silt fencing, straw wattles, and silt and sediment traps. Additional protective actions may include, but are not limited to, adjusting the Phase 1 layout and controlling access during construction. The area will be monitored after storm events to determine whether BMPs need to be adjusted to reduce erosion. If necessary, adjustments to BMPs will be implemented.

Impact Significance: Less than significant after mitigation

Phase 1 Potential Impact 3.3-2. Discharge of sediments and other pollutants to surface water from dewatering of excavations

Groundwater level in the Phase 1 area is expected to be high, and dewatering would likely be required for construction of the wellhead treatment facility foundation. As discussed in Section 3.7, Hazards, the District has in place a Trench Spoils Field Management Practice Program which defines a procedure (see Impact 3.7-1) for assessing the quality of water that would be produced during dewatering activities and identifying the appropriate disposal method for the water. In accordance with this procedure, groundwater produced during dewatering can be discharged directly to the storm drain if trenching activities are conducted greater than 250 feet away from a site with known groundwater contamination. For activities conducted within 250 feet of a site with known groundwater contamination, the groundwater may be discharged to the storm drain if the chemical concentrations are below MCLs for drinking water for the contaminants of concern or to the Oro Loma sanitary sewer if the chemical concentrations are within acceptable limits. The groundwater may require containerization and off site disposal if chemical concentrations exceed acceptable limits for discharge to the Oro Loma sanitary sewer. In each case, appropriate sediment control measures, such as use of a settling tank prior to discharge, would be implemented.

Mitigation Measures 3.3-2. Implement Mitigation Measures 3.7-1b (compliance with the District's Trench Spoils Field Management Practice Program), 3.7-1c (preparation of a disposal plan specifying the disposal method for soil), and 3.7-1d (preparation of a detailed discharged water control and disposal plan), as specified in Section 3.7, Hazards.

Impact Significance: Less than significant after mitigation

3.3.6 References – Surface Water Hydrology and Quality

Alameda Countywide Clean Water Program (ACCWP). 2004. http://www.cleanwaterprogram.org/businesses_developers.htm

California Code of Regulations. 2004. Title 14. Chapter 3: "Guidelines for Implementing the California Environmental Quality Act."

East Bay Municipal Utility District (EBMUD). 2002. Notes from the November 23, 2002 meeting on Flood/Subsidence issues related to the Bayside Groundwater Project between EBMUD, City of San Leandro, Alameda County and FEMA. November 25.

Federal Emergency Management Agency (FEMA). 2000a. FIRM, Flood Insurance Rate Map. City of San Leandro, California, Alameda County, Community Panel Number 060013 003 C. Map revised February 9.

_____. 2000b. FIRM, Flood Insurance Rate Map. Alameda County, California (Unincorporated Areas), Community Panel Number 06001 0090 D. Map Revised February 9.

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Regional Water Quality Control Board (RWQCB) San Francisco Bay. 1995. *Water Quality Control Plan.* June 21, as amended.

_____. 2003. *2002 CWA Section 303(d) List of Water Quality Limited Segment*. Approved by the SWRCB on February 4.

San Francisco Estuary Institute (SFEI). 2003. 2003 Pulse of the Estuary, Monitoring & Managing Contamination in the San Francisco Estuary.

Sowers, Janet M. 1997. Creek and Watershed Map of Hayward and San Leandro.

State Water Resources Control Board. 1997. Water Quality Order No. 97-03-DWQ. *National Pollutant Discharge Elimination System (NPDES), General Permit No. CAS000001 (General Permit), Waste Discharge Requirements (WDRs) For Discharges of Stormwater Associated With Industrial Activities, Excluding Construction Activities.* http://www.swrcb.ca.gov/stormwtr.

_____. 2000b. Human Health Fact Sheet: Methodology. Revised Methodology for Deriving Health-Based Ambient Water Quality Criteria.

Western Regional Climate Center. 2004. Period of Record Monthly Climate Summary, Oakland WSO AP, California (046335). Accessed at: http://www.wrcc.dri.edu/cgi-bin/cliRECtM.pl?caokap. November 12.

3.4 Phase 1 Biological Resources

This section describes impacts and mitigation measures related to biological resources located in the Phase 1 area.

3.4.1 Approach to Analysis

The authors obtained information from field observations made during 2000 and 2003, discussions with ACFCWCD and California Department of Fish and Game (CDFG) personnel, and review of biological and technical reports and literature. The 2003 edition of the California Natural Diversity Database (CNDDB) was also reviewed (CDFG 2003). As part of the research conducted for this DEIR, District staff biologists, accompanied by a qualified biological resources consultant, completed three daytime surveys of the Phase 1 area in October and November 2000. To update these findings, a renowned expert on rails was consulted to determine whether the California clapper rail (*Rallus longirostris obsoletus*) and California black rail (*Laterallus jamaicensis coturniculus*) are likely to be found in the project area and the possible adverse effects of project construction and operation on these birds. Qualified researchers also visited the survey areas again in July 2003 to confirm previous habitat observations and evaluate current conditions.

3.4.2 Setting

The subsections below describe the regional setting of the Phase 1 area and the vegetation communities and wildlife habitats, including salt marsh, found in the project area.

3.4.2.1 Regional Setting

Industrial development in the East Bay during the past century has resulted in the reduction or destruction of native habitats and local extinction of native plant and animal species. While recent habitat preservation and restoration efforts have provided the opportunity for reintroduction and recovery of some native species, much of the remaining habitat in the region provides only marginal support for species tolerant of disturbance by people and their activities.

3.4.2.2 Vegetation Communities and Wildlife Habitat

Historically, the Phase 1 area likely contained tidal marsh. When development began during the late 1700s in what is now the Phase 1 project area, many non-native annual grasses and weeds were introduced. These plants adapted to human settlement, woodcutting, farming, and livestock grazing, which allowed non-native species to invade, dominate, and change the habitat’s character. As a result of the success of these non-native plant communities, populations of some native species, such as the salt marsh harvest mouse (*Reithrodontomys raviventris)*, which is adapted to a single habitat type, have been greatly reduced. In the vicinity of the Phase 1 area, riparian habitat has been removed or altered by flood control efforts. The majority of tidal marshlands have been drained, filled, or otherwise impacted by development. The vegetation currently in the Phase 1 area includes non-native annual grassland, weed communities, and ornamental landscaping.

3.4.2.3 Aquatic Habitat

San Lorenzo Creek. San Lorenzo Creek runs from east to west, north of the Phase 1 area (Figure 3.4-1). Although San Lorenzo Creek is located near the Phase 1 area, it is outside the influence of construction activity and Phase 1 operation. Phase 1 would not result in any construction within the creek corridor, and no Phase 1-related discharges to the creek are proposed.

Bockman Canal. Bockman Canal runs east to west and is located 750 feet south of the Phase 1 area at its closest point. The canal collects surface runoff and conveys it to San Francisco Bay. Within the industrial zone, the canal flows through a trapezoidal channel with earthen banks that support little or no vegetation. Like San Lorenzo Creek, Bockman Canal is tidally influenced west of the railroad tracks, although tide gates restrict movement of tide water upstream. No sensitive aquatic species are found in Bockman Canal.

Jurisdictional Wetlands. Jurisdictional wetlands totaling about 2 acres are found on the Oro Loma Sanitation District (OLSD) property adjacent to the location of the proposed Phase 1 facilities (Figure 3.4-1). The wetland vegetation consists of cattails, sedges, and pickleweed.

Salt Marsh Habitat. The San Leandro Regional Shoreline and surrounding salt marsh within the city limits of San Leandro provide habitat for many common and some sensitive species. The tidal sloughs that cut through the habitat do not have the tule-lined channels typically required for certain sensitive species, including the salt marsh common yellowthroat (*Geothlypis trichas sinuosa*), marsh wren (*Cistothorus palustris*), and California clapper rail (*Rallus longirostris obsoletus*). A field survey performed at the San Leandro Regional Shoreline in September and October 2000 revealed no sensitive species present.

3.4.2.4 Phase 1 Site Characteristics

The existing well head and proposed Phase 1 facilities are located on a site surface characterized by bare soil with widely scattered non-native weeds. No nesting habitat is present on the site or its immediate surroundings.

3.4.3 Special-status Species

Table 3.4-1 lists the results for the regional and local search of the California Natural Diversity Database (CNDDB) for sensitive species in the vicinity of the Phase 1 site. Additional species have been listed based on technical documents, California Native Plant Society lists, bird lists for the area, and expert knowledge.

The Phase 1 area does not fall within the area proposed for designation by the United States Fish and Wildlife Service (USFWS) as critical habitat for the California red-legged frog (*Rana aurora draytonii*). Pooled fresh water lasting through July, the primary habitat constituent for this species, is not naturally present at the site. Thus, red-legged frogs would not be expected to be present within the Phase 1 area.

Legend:

Jurisdictional Wetlands

FIGURE 3.4-1
SALT MARSHES AND FRESHWATER WETLANDS
EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

CH2MHILL

169710.26.ZZ_Fig 3.4-1 Marshes_1/28/05_ccc_sfo

TABLE 3.4-1
Special-status Species and Habitats with that Could Be Found in the Vicinity of the Phase 1 Area

Species	Status[a]	California Distribution	Habitat	Reason for Decline or Concern	Presence in Study Area
Plants					
California seablite *Suaeda californica*	FE / ~	Oregon to Baja California	Margins of coastal salt marsh	Loss of salt marsh habitat	Potential for this species to be present in salt mash habitat; known location approximately 13 miles north
Point Reyes bird's beak *Cordylanthus maritimus* ssp. *Palustris*	FSC / ~	San Francisco Bay to Baja California	In coastal salt marsh with pickleweed and cordgrass	Loss of salt marsh habitat	Potential for this species to be present in salt mash habitat with pickleweed; known location approximately 19 miles north
Amphibians					
California red-legged frog *Rana aurora draytonii*	FT / SSC	Lowlands and foothills near permanent fresh water	Permanent and semipermanent water such as creeks and freshwater ponds. Aestivates in burrow or cracks during dry periods.	Overharvesting (historically), predation by bullfrogs and introduced fishes, loss of habitat	Not known in the heavily developed lowlands of San Leandro, San Lorenzo, and Hayward. Known location in the foothills to the east (Garin Regional Park).
Birds					
California black rail *Laterallus jamaicensis coturniculus*	FSC / ST	Found in marsh habitat from Marin County south	Salt marshes dominated by pickleweed and less frequently in freshwater and brackish marshes	Loss of habitat, Regional Park usage, predation by red foxes and feral cats	Potential for this species to be present in salt marsh habitat with extensive pickleweed. Known to be present in marshes of the San Leandro Regional Shoreline on north side of San Lorenzo Creek
California clapper rail *Rallus longirostris obsoletus*	FE / SE	Coastal wetlands and brackish areas from San Francisco Bay to Morro Bay	Marshes with tidal sloughs around San Francisco Bay	Loss of habitat, predation by red foxes	May be present in marsh areas with sloughs lined by cattails and tules. Known location in salt marsh approximately 10 miles south of project. Potential non-breeding habitat at mouth of San Lorenzo Creek
Western snowy plover *Charadrius alexandrinus nivosus* (nesting colony*)*	FT / ~	Oregon to Baja California	Sandy beaches and salt pond levees where there are sandy or gravel soils for nesting	Loss of habitat	May be present on levees for San Lorenzo Creek and Bockman Canal.

TABLE 3.4-1
Special-status Species and Habitats with that Could Be Found in the Vicinity of the Phase 1 Area

Species	Status[a]	California Distribution	Habitat	Reason for Decline or Concern	Presence in Study Area
California least tern Sterna antillarum browni	FE / SE	Northern California to Baja California	Colonial nester on bare or sparsely vegetated and flat areas such as beaches, alkali flats, land fills, or paved areas	Loss of habitat, predation by harriers, ravens and other natives, and red foxes	May be present in south arm of San Francisco Bay. Known location approximately 12 miles south
Burrowing owl *Athene cunicularia* (burrow sites)	FSC / ~	Open grasslands and desert habitat from San Francisco south to Baja California	Uses burrows of other animals for nesting. Nests in open among low vegetation.	Loss of habitat, predation by red foxes, poisoning of rodents in adjacent areas	1991 record for observation of burrowing owl 0.6 mile west of well site in a now residentially developed area. Potential to be present in rodent burrows on high ground such as levees
Northern harrier *Circus cyaneus*	~ / SSC	Throughout California grasslands and lowlands	Grasslands, freshwater and salt marsh habitats	Predation on ground nests by red foxes	Forages in the vicinity of the project; May nest in marsh to west
Loggerhead shrike *Lanius ludovicianus*	~ / SSC	Permanent resident in grasslands and foothills of California	Oak savanna and other open areas with scattered trees, shrubs, and fences	Loss of habitat, use of pesticide	May be present in fields south of project; Unlikely to be present in project area
Salt marsh common yellowthroat *Geothlypis trichas sinuosa*	FSC / ~	Permanent resident of marsh areas in the San Francisco Bay region	Uses thick cover of tules, cattails, and willows for nesting and foraging	Predation by red foxes and feral cats	Needs dense cover; Unlikely to nest in project area
Mammals					
Salt marsh wandering shrew *Sorex vagrans halicoetes*	FSC / ~	Salt marshes of the south arm of San Francisco Bay	High salt marsh with abundant driftwood and pickleweed	Loss of habitat	Record from 1990 for site 0.8 mile from site within the salt marsh area. Record from 1985 for site 1.8 mile south of well site in salt marsh area
Salt marsh harvest mouse *Reithrodontomys raviventris*	FE / SE/FP	Emergent wetlands of San Francisco Bay	Salt and brackish marshes dominated by pickleweed	Loss of habitat	May be present in salt marsh to west of project; Records for within 1 mile of project site
Habitats					
Northern coastal salt marsh	~ / ~	San Francisco Bay Area, Monterey	--	Draining, development, conversion to grassland	Present in vicinity and west of existing industrial development

TABLE 3.4-1
Special-status Species and Habitats with that Could Be Found in the Vicinity of the Phase 1 Area

Note:

a. Status explanations:

Federal

FE = listed as endangered under the Federal Endangered Species Act
FT = listed as threatened under the Federal Endangered Species Act
FSC = federal species of concern; species that may warrant federal listing, but there is currently insufficient biological information to support a proposed rule.
~ = no listing

State

SE = listed as endangered under the California Endangered Species Act
ST = listed as threatened under the California Endangered Species Act
SSC = species of special concern in California
~ = no listing
FP= Fully Protected Species

Sources: California Natural Diversity Database 2000; California Department of Fish and Game 1995; California Native Plant Society 1994; Skinner, M. W. and B. M. Pavlik 1994.

A salt marsh parcel north of San Lorenzo Creek and bordered by the Heron Bay development serves as a nesting area for the California clapper rail. The California black rail is not likely to nest in this marsh because this species' breeding area is centered in the northern reaches of San Francisco Bay, but the black rail could use the marsh area during the non-breeding season (Evens 2001).

The California clapper rail is listed as endangered under both the federal Endangered Species Act (ESA) and the California Endangered Species Act (CESA); the California black rail is listed as threatened under CESA and a federal species of concern. The bay shore area at the mouth of San Lorenzo Creek is lined on both sides of the creek's shoreline with pickleweed and cordgrass. Clapper rails are known to breed in Central and South San Francisco Bay and have been reported in this marsh during the breeding season. This habitat has been compromised by the invasion of non-native cordgrass. The western portion of Bockman Canal is not critical rail habitat, but may have secondary value for temporary refuge. The breeding season for the clapper rail extends from mid-January through mid-April. Black rails nest from March through May. Black rails are most likely to be found in the emergent tidal marsh at the mouth of San Lorenzo Creek in the non-breeding season (August-February) (Evens 2001).

Construction noise, particularly percussive noise from pile driving, has a high impact on rails. The USFWS considers a construction setback of 700 feet to be the minimum to avoid a take. The nearest distance between the Phase 1 construction area and Bockman Canal is 750 feet, and thus is outside the setback limit. A secondary concern is the inadvertent provision of food and shelter to urban predatory animals (such as feral cats and rats) that would harm rail nests in the marshlands (Evens 2001). The burrowing owl (*Athene cunicularia*), a California species of special concern and federal species of concern, may be present in the area on raised sites such as railroad rights of way and dikes. However, Burrowing owls were not observed at the Phase 1 site during site visits in 2000 and 2003.

There are CNDDB records for salt marsh harvest mouse (*Reithrodontomys raviventris*), a federal and state endangered species, within 0.4 and 0.8 miles of the Phase 1 site. Although the areas of marsh along Bockman Canal are not large enough to support a resident population of salt marsh harvest mouse (*Reithrodontomys raviventris*), juveniles and adults may enter these narrow strips of pickleweed and adjacent uplands seeking temporary refuge during high-tide events. Salt marsh harvest mice do not disperse into developed or bare areas. The Phase 1 site is not salt marsh harvest mouse habitat.

3.4.4 Regulatory Framework

The Proposed Project would be subject to the following federal, state, and regional regulations with respect to biological resources:

- The federal ESA prohibits the "take" of species federally listed as threatened or endangered. Section 7 of the ESA requires federal agencies to consult with USFWS or the National Oceanographic and Atmospheric Administration Fisheries Division if the agencies' actions could adversely affect federally listed species. For projects with no federal involvement, Section 10 of ESA provides for project proponents to obtain an Incidental Take Permit from USFWS. Because construction activity would be located beyond the minimum USFWS setback distance, no adverse effects on California clapper rails would be anticipated. Also, because there is no salt marsh harvest mouse habitat present at the Phase 1 site, consultation with USFWS regarding the clapper rail and the salt marsh harvest mouse would not be necessary for Phase 1.

- The United States Army Corps of Engineers (USACE) has jurisdiction over projects involving the "waters of the United States" and reviews projects involving construction in either creeks or wetland areas that are under jurisdiction of Section 404 of the Clean Water Act. Phase 1 does not include construction activities in creeks or wetland areas and would not require permits under Section 404 or Section 10.

- CDFG has jurisdiction over any activity that could affect the bank or bed of any stream that has value to fish and wildlife. Phase 1 does not include construction activities that affect banks or beds of streams.

- CESA prohibits take of state-listed species. Authorization for take of listed species can be secured through Section 2081 of the California Fish and Game Code. Because construction activity is well buffered by distance from the nearest rail habitat, which is of secondary value only, Phase 1 is not expected to result in take of California clapper rails, California black rails, or salt marsh harvest mice. Therefore, a Section 2081 permit would not be necessary.

3.4.5 Significance Criteria and Impact Analysis Methodology

Consistent with Appendix G of the CEQA Guidelines, a project would normally have a significant impact on biological resources if it would:

- 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 CDFG or USFWS;

- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by CDFG or USFWS;

- 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, and coastal wetlands) through direct removal, filling, hydrological interruption, or other means;

- 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;

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or

- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

3.4.6 Impacts and Mitigation Measures

Potential noise impacts to biological resources are discussed in Section 3.9 Noise (see Phase 1 Potential Impact 3.9-2).

Phase 1 Potential Impact 3.4-1. Transport of sediment into sensitive areas during construction

Phase 1 construction activities would have the potential to increase storm-related runoff of sediment into the adjacent jurisdictional wetlands and Bockman Canal.

Mitigation Measure 3.4-1. Implement standard BMPs for erosion control during construction of the treatment facility. BMPs may include, but are not limited to, the use of silt fencing, straw wattles, and silt and sediment traps. If necessary, adjustments to BMPs will be implemented.

Impact Significance: Less than significant after mitigation

Phase 1 Potential Impact 3.4-2. Accumulation of debris that subsidizes predatory animals

To reduce this risk to the bird population of the marshland habitat, mammal subsidies should be controlled by eliminating garbage and other sources of scavenge and by eliminating predator nesting opportunities (Evens 2001).

Mitigation Measure 3.4-2. EBMUD and its contractor will:

- Dispose of trash routinely and place stored items in bins, containers or other secured facilities to prevent their use as shelter by mammalian predators;
- Maintain locked trash barrels for discarded food items and containers and promptly remove litter, especially food wrappers, bottles, and containers;
- Remove planks and passages over water, and other means of temporary access nightly to prevent mammalian predation of ground nesting birds; and
- Remove all tools, surplus materials, scrap material, debris, and waste from the job site upon completion of construction.

Impact Significance: Less than significant after mitigation

3.4.7 References – Biological Resources

California Code of Regulations. 2004. Title 14. Chapter 3: "Guidelines for Implementing the California Environmental Quality Act."

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3.5 Phase 1 Geology, Soils, and Seismicity

This section describes impacts and mitigation measures related to geology, soils, and seismicity for Phase 1 of the project.

3.5.1 Approach to Analysis

This section assesses impacts that Phase 1 construction and operation could have on the geologic environment, and identifies mitigation measures for impacts that could be significant. The geologic and geotechnical information reviewed for this assessment includes regional reports and documents as well as project-specific studies.

3.5.2 Setting

The subsections below describe the regional geologic setting for Phase 1 of the project.

3.5.2.1 Regional Geology

Groundwater pumping and injection of water that would be part of Phase 1 could affect geologic resources in the SEBPB as well as the NCGWB located to the south (described in Section 3.1, Groundwater Hydrology and Quality). Therefore, geologic resources in both basins are described in this section.

East Bay Plain

The 120-square-mile East Bay Plain is located within the Coast Range geomorphic province. It is characterized by an alluviated area close to the highlands and a marshland area adjacent to the Bay. The SEBPB, located in the East Bay Plain, is the groundwater basin that would be utilized for the project. The eastern boundary of the SEBPB in the San Lorenzo area is defined by the active Hayward Fault, which is located along the base of the East Bay hills. The basin extends beneath San Francisco Bay to the west, to Berkeley in the north, and to the City of Hayward to the south (Figure 3.5-1). Because the precise location of the western boundary under the Bay is not known, Figure 3.5-1 shows this boundary at the edge of the Bay, consistent with how the California Department of Water Resources depicts this boundary. The topography of this basin ranges from about 400 feet above mean sea level (msl) in the east to 0 feet msl in the west where the plain meets San Francisco Bay.

Over time, the geology of the East Bay Plain, including the SEBPB, has been investigated by many researchers, resulting in an evolving understanding of the geology of this area and sometimes inconsistent use of nomenclature in naming specific geologic units. This DEIR discussion uses the nomenclature and geologic model presented in the more recent studies by the United States Geological Survey (USGS 2003b).

The SEBPB is located in a structural depression underlying San Francisco Bay that is bounded by the San Andreas Fault to the west and the Hayward Fault to the east (USGS 2003b). Within the East Bay Plain, bedrock is overlain by a complex sequence of unconsolidated marine and continental deposits. The oldest unconsolidated geologic unit is the Lower Alameda Formation, which includes the “Deep Aquifer” in which the Phase 1 well would be screened. The Lower Alameda Formation consists of continental deposits, including alluvial fan deposits interfingered with lake, swamp, river channel, and flood plain deposits. The Lower Alameda Formation ranges in thickness from 10 feet along the eastern boundary of the basin to 450 feet near the center of San Francisco Bay.

Overlying the Lower Alameda Formation are, in order from youngest to oldest (CH2M HILL 2000):

- A series of younger deposits, collectively referred to as the Newark Aquifer equivalent, including marine clay, Young Bay Mud, Merritt Sand, and alluvial silts, sands and gravels; these deposits are typically 100 to 125 feet thick and as thick as 300 feet towards the eastern edge of the SEBPB;
- Old Bay Mud, also called Yerba Buena Mud, which is an estuarine mud typically about 50 feet thick; and
- Upper Alameda Formation, also called Centerville and Fremont Aquifer equivalents, which consists of marine sediments separated by alluvial fan deposits, approximately 100 to 475 feet thick.

Niles Cone Groundwater Basin

The Niles Cone Ground Water Basin (NCGWB) is located to the south of the SEBPB. This approximately 103-square-mile basin is bounded by the Diablo Range on the east and the San Francisco Bay on the west. The northern boundary is defined by the limits of the Alameda County Water District (ACWD) in southern Hayward. The southern boundary is defined as the Alameda-Santa Clara County border.

The Hayward Fault cuts across the Niles Cone alluvial fan, impeding westward groundwater flow, and divides the basin into two sub-basins, the Below the Hayward Fault (BHF) and Above the Hayward Fault (AHF) sub-basins. Only the BHF sub-basin would be affected by the proposed project and is thus described further in this discussion. The geologic units occurring within the BHF sub-basin, from youngest to oldest, are as follows:

- The youngest deposits in the NCGWB include alluvium consisting of unconsolidated gravel, sand, silt, and clay. The aquifers are composed of gravels and sands deposited from the ancestral Alameda Creek and other small creeks. The grain size and thickness of the sand and gravel deposits decrease from west to east, and the thickness of the intervening clay layers increases toward the west. The silt and clay layers that separate the sand and gravel layers are regionally extensive in the NCGWB but absent immediately west of the Hayward Fault in an area referred to as the Forebay Area (Figure 3.5-1).
- The Lower Alameda Formation (also referred to as the Santa Clara Formation) consists of poorly sorted pebbly sandstone, siltstone, and clay. In the NCGWB, this unit is probably greater than 500 feet thick. Although the lateral extent of this unit has not been well defined, it is likely to extend beyond the boundaries of the NCGWB.

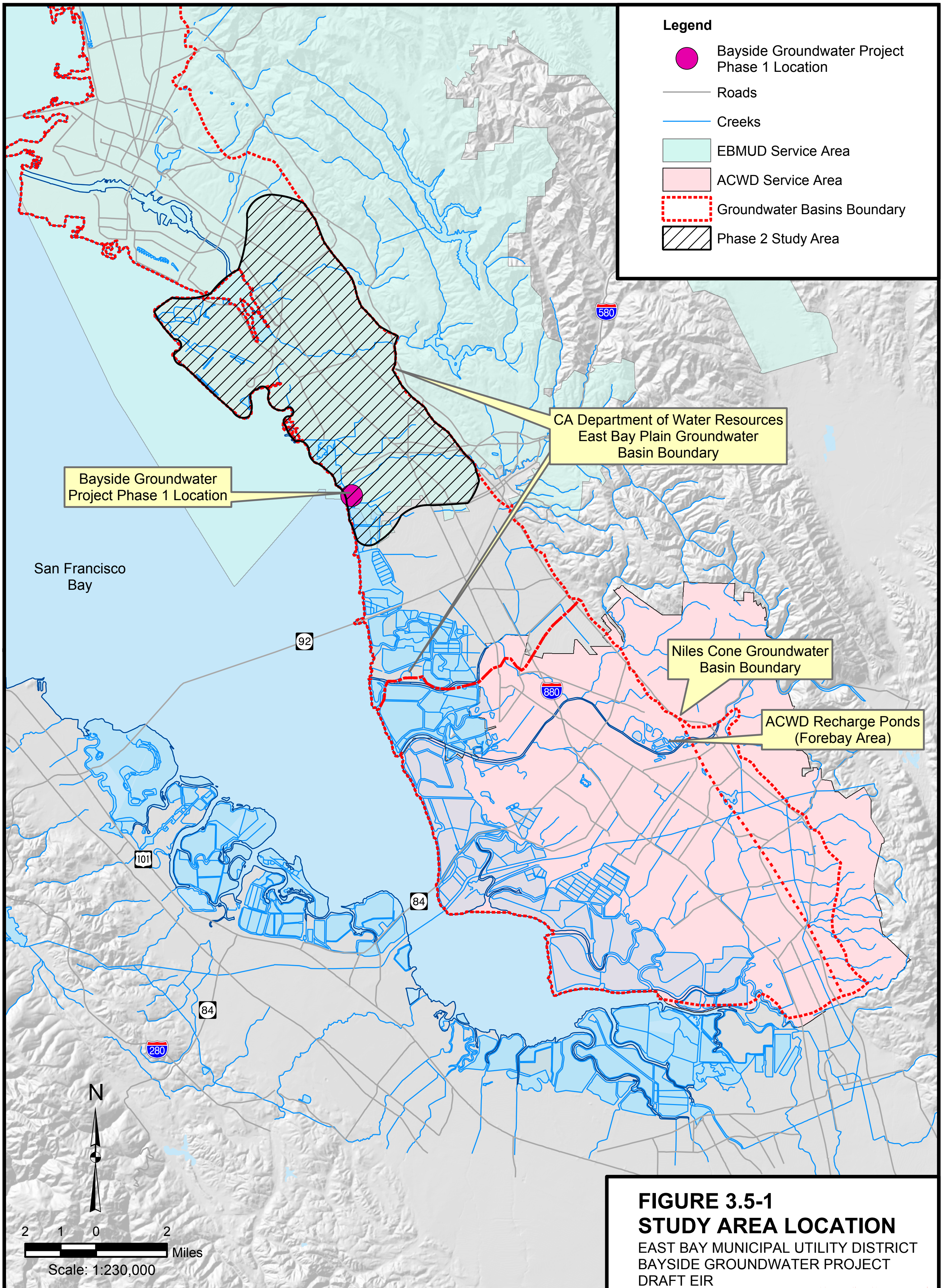

FIGURE 3.5-1
STUDY AREA LOCATION
EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

CH2MHILL

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3.5.2.2 Project Site Geology and Shallow Groundwater Conditions

A site-specific geotechnical investigation has not been conducted for the Proposed Project; however, geotechnical investigations have been conducted for construction activities at the Oro Loma Sewage Treatment Plant to the west. Based on this information, the shallowmost geologic materials in the area of the Phase 1 site are expected to consist of fill to depths of 2 to 4 feet below ground surface (bgs) and soft to firm clay of the Young Bay Mud to depths of 9 to 20 feet (DCM/Joyal Engineering 2001). These materials are underlain by alternating layers of clay and sand to depths of 80 feet bgs. A high water table (between 0.5 foot and 6.5 feet bgs) has been observed at the Oro Loma Sewage Treatment Plant and at the Phase 1 site.

3.5.2.3 Project Site Topography

The Phase 1 site is relatively level, with a surface elevation of approximately 5 feet msl.

3.5.2.4 Regional Seismicity

The San Francisco Bay Area is a region of high seismic activity because of faulting within the San Andreas system. The principal faults of this system include San Gregorio, San Andreas, Hayward-Rodgers Creek, Calaveras, Concord-Green Valley, and Greenville Faults plus the Mt. Diablo Thrust (USGS 2003a). Figure 3.5-2 is a regional fault map showing the location of these faults. The USGS estimates that there is a 62 percent probability of at least one magnitude 6.7 or greater earthquake occurring within the San Francisco Bay Area before 2031. East of the bay, the probability of such an earthquake occurring is 46 percent. A magnitude 6.7 or greater earthquake would most likely occur on one of the 7 principal faults, but it could also occur on a different known fault or a previously unidentified fault. The faults considered to have the greatest potential to cause damage in the vicinity of the Phase 1 site are the Hayward-Rodgers Creek, San Andreas, and Calaveras Faults.

Table 3.5-1 lists fault location relative to the Phase 1 site, date of most recent large earthquake and Richter magnitude, probability of one or more magnitude 6.7 earthquakes before 2031, maximum moment magnitude, slip rate, and Uniform Building Code (UBC) classification for each of these faults.

3.5.2.5 Seismic Hazards

Primary hazards associated with earthquakes include surface rupture and ground shaking. Secondary effects include ground failures such as liquefaction, lateral spreading, ground lurching, and landslides as well as water inundation from earthquake-generated waves (tsunamis or seiches) or dam or levee failure.

Direct Surface Rupture

Fault displacement can cause rupture along the surface trace of a fault, which can result in severe damage to structures or other development located on the fault trace. The chance of an earthquake occurring is considered highest on an active fault, although earthquakes can also happen on faults considered to be inactive or on previously unidentified faults. No known active fault or segment runs through the Phase 1 site; therefore, the potential for earthquake-induced surface rupture is considered low.

Ground Shaking

Magnitude is a measure of the energy released in an earthquake, and intensity is a measure of the ground-shaking effect at a particular location. Ground shaking is the cause of most damage during earthquakes. The degree of shaking that would be expected at a particular site depends on the site's distance from the earthquake source; the magnitude of the earthquake; and the type, thickness, and condition of the geologic materials (bedrock, sediment, soil, fill). Ground shaking may be intensified because of the composition of underlying soils, even at locations relatively distant from faults. The Modified Mercalli (MM) intensity scale is commonly used to measure (and describe in lay terms) earthquake effects resulting from ground shaking. MM intensity values range from I (earthquake not felt) to XII (damage nearly total); intensities ranging from IV to X could cause moderate to significant structural damage (Table 3.5-2). Earthquake modeling performed by the Association of Bay Area Governments (ABAG 2003) indicates that the Phase 1 site would experience strong (MM VII) to violent (MM IX) ground shaking in the event of a 6.5 magnitude earthquake on any segment of the San Andreas, Hayward-Rodgers Creek, or Calaveras Faults. The maximum ground shaking would be expected to result from a large earthquake on the Hayward Fault.

TABLE 3.5-1
Major Faults[a] Within a 20-Mile Radius of the Phase 1 Site

Fault	Nearest Location and Direction (miles)	Date of Most Recent Large Earthquake and Magnitude	Probability of ≥ Magnitude 6.7 Earthquake by 2031[b]	Maximum Moment Magnitude[c]	Slip Rate [d]	UBC Classification[e]
Hayward – Rodgers Creek	4, East	1868, 7.0	27%	7.1	9 millimeter/yr	A
Calaveras	16, East	1984,	11%	6.8	6 – 15 millimeter/yr	B
San Andreas	15, Southwest	1989, 7.1	21%	7.9[f]	17 -24 millimeter/yr	A

Notes:

[a] A major fault is one of the 7 faults used by the USGS to estimate the probability of a future major earthquake occurring in the San Francisco Bay Area. The USGS refers to these faults as "characteristic faults." The highest probability of a ≥ magnitude 6.7 earthquake is on one of these faults although such an event could also occur on other known or previously unidentified faults in the region.

[b] This is the probability of one or more ≥ magnitude 6.7 earthquakes occurring along each fault before the year 2031.

[c] The maximum moment magnitude earthquake (M) is the strongest earthquake that is likely to be generated along a fault zone based on empirical relationships among M, surface rupture length, down-dip rupture width, and rupture area.

[d] The slip rate is the amount of surface displacement in millimeters. Each fault is composed of several segments; the slip rate shown here is the range of rates provided for each segment.

[e] A class-A fault has more than 5 centimeters of slip per year and has an estimated fault moment magnitude ≥7.0. The Calaveras Fault is classified as a class-B fault because it has a slip rate > 2 millimeters/year a maximum moment magnitude <7.

[f] The 1906 earthquake on the San Andreas Fault had a Richter magnitude of 8.3.

Sources: USGS 2003a, Petersen et al. 1996, International Conference of Building Officials 1994.

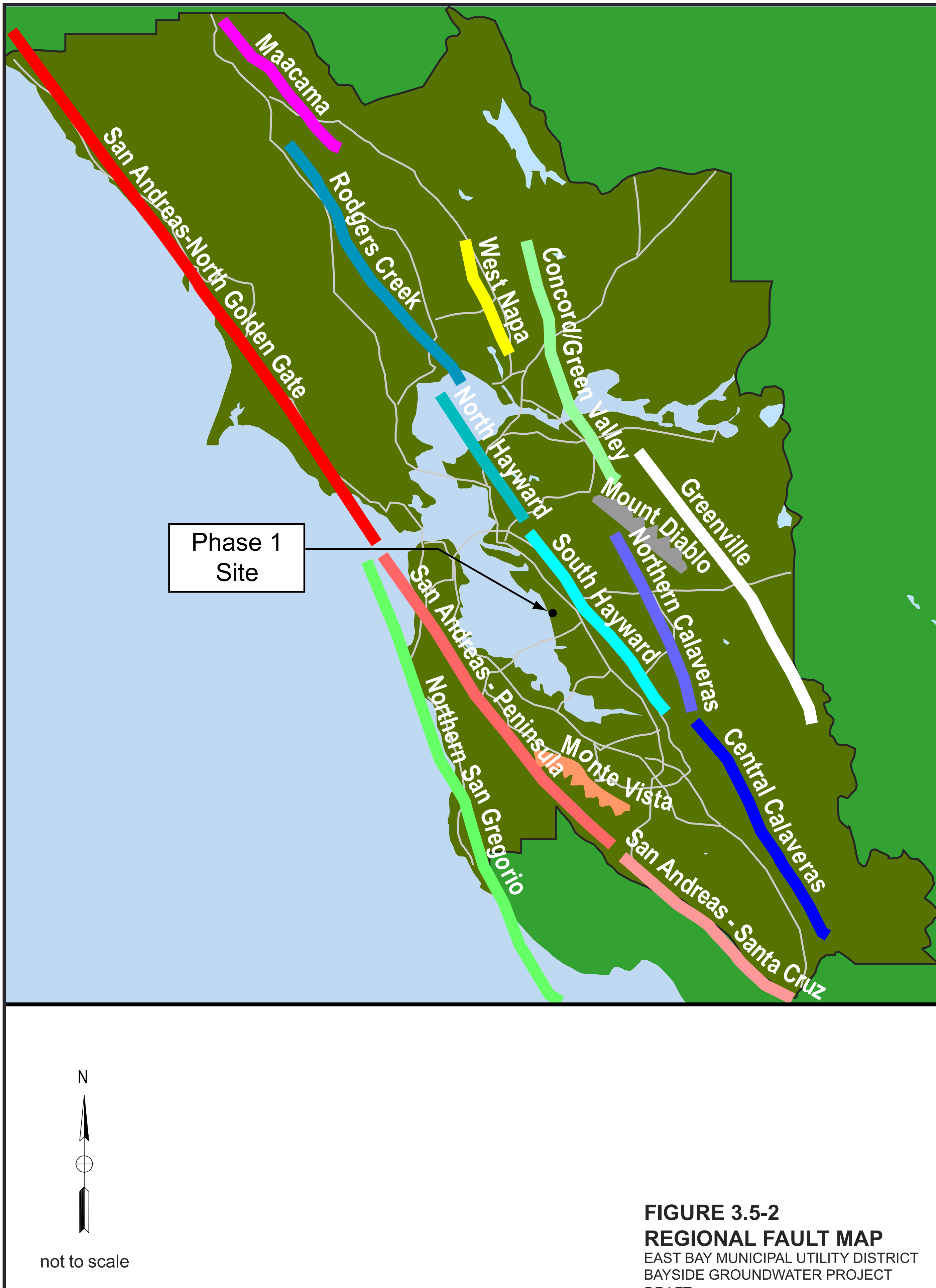

FIGURE 3.5-2
REGIONAL FAULT MAP
EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

CH2MHILL

TABLE 3.5-2
Modified Mercalli Intensity Scale – Estimated Range of Intensities for Project Area for Richter Magnitude 6.5 Earthquake

VII	Everybody runs outdoors. Damage negligible in buildings of good design and construction, slight to moderate in well-built ordinary structures, considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motor cars.
VIII	Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, and walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motor cars disturbed.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.

Secondary Ground Failure

Ground motion induced by earthquakes or aftershocks may cause secondary ground failures, typically the result of soil losing its structural integrity. Types of seismically induced ground failures include liquefaction and densification, ground lurching, and landslides.

Liquefaction and Densification

Liquefaction occurs when a loose saturated cohesionless soil, such as sand, is subjected to a shock and experiences an increase in pore water pressure. The soil loses a substantial amount of strength and may collapse. Potential consequences of liquefaction include the loss of bearing capacity, differential settlement, and lateral spreading; these can cause serious building foundation failures and naturally buoyant structures such as underground storage tanks may be raised aboveground. Densification takes place when dry cohesionless sands above the water table are subjected to ground shaking; subsidence and differential settlement of geologic materials could result from densification. The Phase 1 site is located within a zone of potential liquefaction (California Geologic Survey Department of Conservation 2003a).

Ground Lurching

Ground lurching is the horizontal movement of soil, sediments, or fill located on relatively steep embankments or scarps, forming irregular ground surface cracks. The potential for lurching is low across the Phase 1 site because there is little vertical relief.

Landslides

The Phase 1 site is not mapped within a potential area of earthquake-induced landslides (California Geologic Survey Department of Conservation 2003a).

Water Inundation

Another potential hazard associated with earthquakes is water inundation by tsunamis. Tsunamis are seismically induced sea waves that, upon entering shallow near-shore waters, may reach heights that can cause widespread damage to coastal areas. The risk of tsunami at San Lorenzo would be relatively low because the city does not face the open ocean. It is estimated that a 100-year frequency tsunami would generate a wave run-up of 4.4 feet at the San Leandro shoreline (City of San Leandro 2002). Because the run-up would attenuate (decrease) with distance from the Golden Gate, it is expected that the run-up would be smaller in San Lorenzo, located to the south.

3.5.2.6 Regulatory Framework

The subsections below describe codes and regulations relevant to the geologic impacts of Phase 1.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures built for human occupancy. In accordance with this act, the State Geologist established regulatory zones called "earthquake fault zones" around the surface traces of active faults and published maps showing these zones. Within these zones, buildings for human occupancy cannot be constructed across the surface trace of active faults. Phase 1 would not be subject to the requirements of this act because no earthquake fault zones are located within the Phase 1 site, and no project facilities would be classified as buildings for human occupancy.

Seismic Hazard Mapping Act

The Seismic Hazard Mapping Act was passed in 1990 following the Loma Prieta earthquake to identify and mitigate seismic hazards and thereby reduce threats to public health and safety and minimize the loss of life and property. Under this act, the California Geologic Survey has produced Seismic Hazard Zone Maps delineating areas of potential liquefaction and earthquake-induced landslides in much of the Bay Area. Cities, counties, and state agencies are directed to use the Seismic Hazard Zone Maps in their land-use planning and permitting processes. Areas of potential liquefaction and earthquake induced landslides are mapped on a broad scale based on regional information, and the Seismic Hazards Mapping Act requires that site-specific geotechnical investigations be performed prior to permitting most urban development projects within the hazard zones. Evaluation and mitigation of seismic hazards identified must be conducted in accordance with guidelines established by the California State Mining and Geology Board Department of Conservation (1997). The requirements of this act would not apply to the proposed project because the Phase 1 facilities would be occupied for fewer than 2,000 person-hours per year.

Uniform Building Code

The UBC (International Conference of Building Officials 1994) contains engineering and design code requirements that address seismic safety for new construction. During the early 1970s and late 1980s, the UBC seismic design criteria underwent significant changes, which reduce the risks associated with seismic activity. Requirements for evaluating expansive soil and specifying foundation design and construction standards to protect against damage from expansive soil are also contained in the UBC. Phase 1 will meet applicable UBC requirements.

3.5.3 Significance Criteria and Impact Analysis Methodology

The subsections below describe the criteria for determining whether Phase 1 would have significant geologic impacts and the methodology used to assess these impacts.

3.5.3.1 Significance Criteria

Consistent with CEQA Guidelines Appendix G, a project would normally have significant geologic impacts if it would:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;
  - Strong seismic ground-shaking;
  - Seismic-related ground failure including liquefaction; or
  - Landslides.
- Result in substantial soil erosion or the loss of topsoil;
- Be located on a geologic unit or soil that is unstable or could become unstable as a result of the project and potentially result in on- or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse;
- Be located on expansive soil, as defined in Table 18-1-B of the UBC (1994) creating substantial risks to life or property; or
- Be subject to inundation by seiche or tsunami (earthquake-generated waves) or mudflow.

Inundation by seiche, tsunami, or mudflow is identified under CEQA as a hydrology and water quality significance criterion but is addressed in this section because this criterion is related to seismicity.

3.5.3.2 Methodology

Potential impacts related to geology and seismicity were assessed by evaluating known conditions within the Phase 1 project area. Phase 1 activities during construction and operation were evaluated relative to the existing conditions and against the significance criteria stated above. Impacts considered but found not to be present were identified as noted above. Impacts considered to be potentially present are discussed below along with mitigation measures to reduce these impacts to less than significant levels.

3.5.4 Effects Found to be Not Significant

The following impacts were considered but were found to be not significant or not applicable to Phase 1 of the project; therefore, there is no further discussion of these impacts.

Earthquake fault rupture. No known faults cross the Phase 1 site; therefore, there are no potential impacts related to fault rupture.

Earthquake-induced landsliding. Phase 1 would be constructed on flat topography that would not be subject to landslides. In addition, none of the Phase 1 features would be constructed within an area mapped by the California Geologic Survey (2003) as a potential area of earthquake-induced landslides. Therefore, no impacts related to earthquake-induced landsliding are expected.

Erosion and loss of top soil. Phase 1 would be constructed on flat topography, which would not change as a result of construction. In addition, measures to control surface soil erosion during and after construction would be implemented as part of standard construction procedures as specified in Phase 1 Surface Water Hydrology and Quality (Section 3.3), and Mitigation Measure 3.4-1 in the Phase 1 Biological Resources section (Section 3.5).

Inundation by seiche, tsunami, or mudflow. As stated in the description of the geologic setting above, a 100-year tsunami would be expected to have a 4.4-foot run-up along the San Leandro shoreline (City of San Leandro 2002), which would be expected to be smaller in San Lorenzo. Because the shoreline is protected and the Phase 1 site is located approximately 1,000 feet inland from the Bay shoreline at an elevation of approximately 5 feet, Phase 1 is not expected to be subject to seiche, tsunami, or mudflow.

Water Level Change. Groundwater modeling indicates that less than 2 feet of drawup could occur in the shallow aquifer as a result of injection into the Deep Aquifer. This water level rise is too small to significantly affect the potential for liquefaction in the area. Observed historical water level data support the hydraulic isolation of shallow and deep aquifer zones. Therefore, injection of water into the aquifer is not expected to increase liquefaction potential.

3.5.5 Impacts and Mitigation Measures

Phase 1 Potential Impact 3.5-1: Earthquake damage to Phase 1 facilities

As is true for the entire region, the Phase 1 site could likely experience high to severe ground shaking from a large earthquake on a nearby active fault during the design lifetime of the proposed project. As discussed in the Setting subsection above, modeling by ABAG predicts that the Phase 1 site would experience strong (MM VII) to violent (MM IX) ground shaking in the event of a 6.5 magnitude earthquake on any segment of the San Andreas, Hayward-Rodgers Creek, or Calaveras Faults. In addition, the USGS predicts that the probability of an earthquake of greater than or equal to magnitude 6.7 occurring on one of the 3 nearby faults ranges from 11 percent to 27 percent; the cumulative probability of an earthquake occurring on one of the faults would be greater.

Ground shaking is the most widespread effect of earthquakes and poses a greater seismic threat than local ground rupture. Strong ground shaking could cause secondary effects including spreading, liquefaction, or collapse which could damage the new wellhead treatment facility and 500-foot connection to the main in Grant Avenue. As part of standard design procedures, the proposed facilities would be designed to withstand strong ground shaking from an earthquake. Performance of geotechnical investigation and of construction in accordance with appropriate seismic design criteria in the UBC would reduce the potential ground shaking impact to less than significant. Compliance with UBC requirements for expansive soil would reduce the related potential impacts to less than significant.

EBMUD maintains an earthquake preparedness and emergency response program to inform and train EBMUD personnel in proper procedures inspecting, responding, and repairing facilities following an earthquake. As part of the program, EBMUD conducts practice drills of emergency response procedures annually using simulated earthquake scenarios.

Mitigation Measure 3.5-1a. Identify the appropriate UBC design criteria for the Phase 1 facilities on the basis of the subsurface conditions at the site and ensure that the UBC design criteria are incorporated into the final design of the project.

Mitigation Measure 3.5-1b. Update the EBMUD earthquake preparedness and emergency response program to include Phase 1 facilities.

Impact Significance: Less than significant after mitigation

3.5.6 References – Geology, Soils, and Seismicity

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_______. 2003b. *Hydrogeology and Geochemistry of Aquifers Underlying the San Lorenzo and San Leandro Areas of the East Bay Plain, Alameda County, California.* Water-Resources Investigations Report 02-4259. Prepared in Cooperation With the East Bay Municipal Utility District and Alameda County Department of Public Works.

3.6 Phase 1 Air Quality

This section describes potential impacts and mitigation measures related to air quality for Phase 1 of the project.

3.6.1 Approach to Analysis

Potential sources of air emissions from Phase 1 are dust, particulates, and exhaust gases from construction activity. Air emissions estimates and mitigation measures have been developed according to the Bay Area Air Quality Management District's (BAAQMD) *BAAQMD CEQA Guidelines, Assessing the Air Quality Impacts of Projects and Plans* (1999). BAAQMD mitigation measures are proposed as part of the project to avoid significant temporary air quality impacts during construction.

3.6.2 Setting

The subsections below describe the elements of the Phase 1 setting related to air quality.

3.6.2.1 Meteorology

The Phase 1 site is within the San Francisco Bay Area Air Basin (BAAB). Temperatures at nearby Metropolitan Oakland International Airport average 58 degrees Fahrenheit annually. Rainfall is highly variable and confined mostly to the period from early November to mid-April. The San Leandro area averages 18 inches of precipitation annually. Winds in the project area are typically out of the west, west-northwest, and northwest (about 50 percent of the time). All other wind directions are observed no more than 7 percent of the time, individually, and calm conditions are observed during 16 percent of annual observations. Annual average wind speeds are approximately 8 miles per hour (CARB 1984).

3.6.2.2 Ambient Air Quality

Table 3.6-1 summarizes data from the BAAQMD monitoring stations closest to the Phase 1 site and compares measured pollutant concentrations with state ambient air quality standards (SAAQS), which are more stringent than the corresponding federal standards.

Ozone. Table 3.6-1 shows that the state standard of 0.09 ppm for 1 hour was exceeded in San Leandro on one to three days between 1998 and 2003; the less stringent federal standard of 0.12 ppm was not exceeded during this same period, according to published data.

Carbon Monoxide. CO is an odorless, colorless gas usually formed as the result of incomplete combustion of fuels. The state CO standard was not exceeded between 1998 and 2003, according to Table 3.6-1.

TABLE 3.6-1
San Leandro Ambient Air Quality Monitoring Summary 1998–2003

Pollutant	Standard[a]	Number of Days Standards Were Exceeded and Maximum Concentration Measured[b]					
		1998	1999	2000	2001	2002	2003
San Leandro							
Fine Particulates (PM_{10})							
Max. 24-hr. Conc. (µg/m³)	>50 µg/m³	32	NA[c]	NA[c]	NA[c]	NA[c]	NA[c]
Annual Geometric Mean (µg/m³)	>30 µg/m³	13					
Calculated Days > State Std.[c]		0	NA[c]	NA[c]	NA[c]	NA[c]	NA[c]
Ozone							
Days > State Std.		2	3	1	0	1	2
Max. 1-Hour Conc. (ppm)	>0.09 ppm	**0.11**	**0.11**	**0.10**	0.09	**0.10**	**0.10**
Fremont							
Fine Particulates (PM_{10})							
Max. 24-hr. Conc. (µg/m³)	>50 µg/m³	**63**	**88**	**58**	**58**	**54**	37
Annual Geometric Mean (µg/m³)	>30 µg/m³	20	21	19	20	19	18
Calculated Days > State Std.		6	12	6	18	1	0
Inhalable Particulates ($PM_{2.5}$)							
Max. 24-hr. Conc. (µg/m³)	>65 µg/m³	NA[d]	57	45	57	48	34
Days > National Std.		NA[d]	0	0	0	0	0
Downtown Oakland							
Carbon Monoxide							
Days > 1-Hour State Std.		0	0	0	0	0	0
Days > 8-Hour State Std.		0	0	0	0	0	0
Max. 1-Hour Conc. (ppm)	>20 ppm	6	6	5	5	4.4	3.9
Max. 8-Hour Conc. (ppm)	>9 ppm	4.6	5.2	3.4	4.0	3.3	2.8

Notes:
BAAQMD Monitoring Stations: Alice Street in Oakland, Chapel Way in Fremont, and County Hospital in San Leandro.
Conc. = concentration; ppm = parts per million; µg/m³ = micrograms per cubic meter; NA = not available
Bold values are in excess of applicable standard.

a State standard, not to be exceeded
b The number of days above the standard is not necessarily the number of violations of the standard for the year.
c Monitoring discontinued in mid-1998 at San Leandro.
d Monitoring began in 1999 at Fremont.

Source: BAAQMD 1998-2003.

Particulate Matter (PM_{10} and $PM_{2.5}$). Particulate matter consists of extremely small airborne particles. Motor vehicles generate about half of Bay Area particulates through tailpipe emissions and brake pad and tire wear. Construction activity is another source of fine particulates. Table 3.6-1 shows that exceedances of the state PM_{10} standard occur relatively infrequently in San Leandro. State PM_{10} standards were exceeded twice out of 152 measurement days during 1996 to 1998 (PM_{10} is not monitored every day). Federal PM_{10} standards were not exceeded at the San Leandro monitoring station. $PM_{2.5}$ monitoring in Fremont indicates that the national standard was not exceeded between 1999 and 2003. Annual average concentrations are not available to determine consistency with the new state standard.

Other Criteria Air Pollutants. The state and national standards for lead (Pb), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2) have not been exceeded in the Bay Area for decades. These standards will not be exceeded in the foreseeable future (BAAQMD 1999).

3.6.2.3 Regulatory Framework

The subsections below describe applicable state and national regulatory standards for air quality.

Ambient Air Quality Standards. The 1977 Clean Air Act (U.S. EPA 2002) requires a regional air quality plan to achieve all standards within the deadlines specified in the act. Table 3.6-2 summarizes the BAAB attainment status with respect to federal standards. In general, the Bay Area experiences low concentrations of most pollutants when compared to federal standards, except for ozone (O_3) and particulate matter, which periodically exceed the standards.

BAAB attainment status under the California Clean Air Act is also summarized in Table 3.6-2. In general, the Bay Area experiences low concentrations of most pollutants when compared to state standards, except for O_3 and particulate matter, which are periodically exceeded.

The California Air Resources Board (CARB) is responsible for regulating air quality, which includes establishing SAAQS, emissions standards, and regulations for mobile sources and overseeing air pollution control districts, which have primary responsibility over stationary sources. BAAQMD is responsible for air quality regulation (state and federal) within the BAAB. BAAQMD has permit authority over most types of stationary emission sources and can impose emission limits and set conditions on the permits that it issues.

3.6.2.4 Sensitive Receptors

Sensitive receptors are those population groups associated with schools, day care centers, hospitals, and convalescent homes. They have higher susceptibility to respiratory distress than does the general population. There are no sensitive receptors adjacent to or nearby the Phase 1 site.

TABLE 3.6-2
Criteria Pollutant Attainment Status for Alameda County

		SAAQS		NAAQS	
Pollutant	**Averaging Time**	**Concen-tration**	**Attainment Status**	**Concen-tration**	**Attainment Status**
Ozone	8-Hour	- -	- -	0.08 ppm	U
	1-Hour	0.09 ppm	N	0.12 ppm	N
Carbon Monoxide	8-Hour	9.0 ppm	A	9 ppm	A
	1-Hour	20 ppm	A	35 ppm	A
Nitrogen Dioxide	Annual Average	- -	- -	0.053 ppm	A
	1-Hour	0.25 ppm	A	- -	- -
Sulfur Dioxide	Annual Average	- -	- -	0.03 ppm	A
	24-Hour	0.04 ppm	A	0.14 ppm	A
	1-Hour	0.25 ppm	A	- -	- -
Inhalable Particulates (PM_{10})	Annual Arith. Mean	- -	- -	50 µg/m^3	A
	Annual Geo. Mean	30 µg/m^3	N	- -	- -
	24-Hour	50 µg/m^3	N	150 µg/m^3	U
Inhalable Particulates ($PM_{2.5}$)	Annual Arith. Mean	- -	- -	15 µg/m^3	U
	24-Hour	- -	- -	65 µg/m^3	U
Sulfates	24-Hour	25 µg/m^3	A	- -	- -
Lead	Calendar Qtr.	- -	- -	1.5 µg/m^3	A
	30-Day Avg.	1.5 µg/m^3	A	- -	- -
Hydrogen Sulfide	1-Hour	0.03 ppm (42 µg/m^3)	U	- -	- -
Visibility-Reducing Particles	8-Hour (1,000-1,800 PST)	Visibility = 10 miles	U	- -	- -

Notes:
A = Attainment; N = Nonattainment; U = Unclassified
ppm = parts per million; µg/m^3 = micrograms per cubic meter
NAAQS = National Ambient Air Quality Standards
SAAQS = State Ambient Air Quality Standards (California)
Source: BAAQMD 2003.

3.6.3 Significance Criteria and Impact Analysis Methodology

The subsections below describe the criteria for determining whether Phase 1 construction would have significant air quality impacts and the methodology for determining these impacts.

3.6.3.1 Significance Criteria

Consistent with CEQA Guidelines Appendix G, a project would normally have a significant impact on air quality if it would:

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

3.6.3.2 Methodology

Construction-related impacts are evaluated based on methodologies outlined by the BAAQMD.

3.6.4 Effects Found to be Not Significant

The following impacts were considered but were found to be not significant or not applicable to Phase 1 of the Project; therefore, there is no further discussion of these impacts.

Operation of the treatment facility at Well No. 1

Bayside Well No. 1 filters would be backwashed to remove accumulated sand and grit. Backwash water would be pumped to a backwash tank where heavier particles would settle out by gravity. The oxygen demand of these solids would be very low as they contain little organic matter. Routine pumping out and discharging of the thickened sediment would prevent creation of anaerobic conditions. Nominal dilution with fresh air would reduce the strength of minor odor when a filter bed is drained before backwashing is initiated. Therefore, potential odor from operations would not be significant.

Wellhead treatment would consist of chemical additions (chloramination or dechlorination, fluoridation) and filtration for minerals. There would be no direct ventilation of treatment chemical to the air during Phase 1 operation. There would be no emission source(s) and therefore no air quality-related operational impacts.

3.6.5 Impacts and Mitigation Measures

3.6.5.1 Construction Impacts

Phase 1 Potential Impact 3.6-1. Particulate and exhaust emissions generated from construction of Phase 1 facilities

BAAQMD CEQA Guidelines (1999) acknowledge that construction emissions vary markedly from project to project, day to day, and one contractor to another. Rather than focus on a quantification of project-related emissions, BAAQMD considers project-related particulate (PM_{10}) emissions to be mitigated to less than significant levels with implementation of applicable dust control measures. These measures are grouped into three categories:

- Basic Control Measures apply to all construction sites,
- Enhanced Control Measures apply to sites larger than 4 acres (total area of disturbance at any given time),
- Optional Control Measures apply to larger sites near sensitive receptors.

The construction disturbance area for Phase 1 wellhead facilities for dust (PM_{10}) generation is estimated to be 0.6 acre and would therefore be subject to implementation of Basic Control Measures stated in Mitigation Measure 3.6-1.

Construction equipment emits CO and ozone precursors during combustion of diesel fuel. BAAQMD's determination is, however, that these emissions have been included in the emissions inventory that was the basis for the 1997 CAP (BAAQMD 1997) and any subsequent air quality plans. Because BAAQMD does not consider construction-related exhaust emissions to be "new" emissions, these emissions would not impede attainment or maintenance of O_3 or CO standards in the air basin (BAAQMD 1999). Therefore, emissions associated with operation of construction equipment during project construction would be less than significant.

BAAQMD does not have methodologies for estimating impacts from diesel exhaust or determining the significance of a project's contribution. However, because the construction phase is estimated to generate only approximately eight truck deliveries total, the Phase 1 diesel exhaust particulate emissions would be less than significant.

Mitigation Measure 3.6-1. Construction activities must comply with the Basic Control Measures for dust emissions, as outlined in BAAQMD *CEQA Guidelines*. These include:

- Water all active construction areas at least twice daily.
- Cover all trucks hauling soil, sand, and other loose debris *or* require all truckloads to maintain at least 2 feet of freeboard.
- Pave, apply water three times daily, or apply nontoxic soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.
- Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at construction sites.
- Sweep streets daily (with water sweepers), if visible soil material is carried onto adjacent public streets.

Impact significance: Less than significant after mitigation

3.6.6 References – Air Quality

Bay Area Air Quality Management District (BAAQMD). 1997. *Bay Area 1997 Clean Air Plan.* December.

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California Air Resources Board (CARB). 1984. California Surface Wind Climatology.

California Code of Regulations. 2004. Title 14. Chapter 3: "Guidelines for Implementing the California Environmental Quality Act."

U.S. EPA. 2002. Clean Air Act.

3.7 Phase 1 Hazards

This section analyzes potential hazards and mitigation measures related to Phase 1 of the project.

3.7.1 Approach to Analysis

This section assesses potential environmental impacts associated with hazardous materials or hazardous wastes that could be encountered in soil and groundwater in the Bayside Groundwater Project area during Phase 1 construction. This analysis is based on a review of existing and historic land uses in the project vicinity and on documented environmental cases. The analysis also addresses potential impacts associated with the use of hazardous materials during operation of the Proposed Project based on the proposed type, volume, and handling of chemicals.

3.7.1.1 Definitions and Assumptions

The California Health and Safety Code defines a hazardous *material* as, "...any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety, or to the environment. A hazardous *waste* is any hazardous material that is discarded, abandoned, or is to be recycled. Hazardous materials and hazardous wastes can be harmful if released to the soil or groundwater or if allowed to become airborne in vapors, fumes, or dust.

3.7.2 Setting

The subsections below describe the environmental setting related to hazardous materials and Phase 1 of the project, including land uses, investigations, and environmental cases.

3.7.2.1 Hazardous Materials in Soil and Groundwater

The potential to encounter hazardous materials in soil and groundwater during construction of Phase 1 facilities was evaluated through a review of historic land uses and soil investigations in the vicinity as well as identification of current land uses, permitted hazardous materials uses, and environmental cases in the vicinity of the Phase 1 project area.

Historic and Current Land Uses

The existing Bayside Well No. 1 is located to the east of the Oro Loma Wastewater Treatment Plant within an industrial/commercial area. Review of aerial photographs indicates that this property has remained undeveloped. The Oro Loma Wastewater Treatment Plant to the west is currently in operations and was constructed by 1957. By 1969, the existing railroad tracks to the east were constructed as were industrial buildings to the north. Areas to the immediate south and east of Bayside Well No. 1 are currently vacant although there are industrial uses further east. Portions of the open area to the east of the well site were leased to various construction and salvage firms between the 1980s and 2000 (The Denali Group 2000). High-voltage Pacific Gas and Electric Company (PG&E) power transmission lines are also located to the east of this site.

Nearby Investigations

An investigation was conducted in 2000 to evaluate soil and groundwater quality in the adjacent open area to the east of Bayside Well No. 1 (The Denali Group 2000). As part of this investigation, 10 soil borings were drilled to a maximum depth of 9.5 feet. Soil samples from each boring and grab groundwater samples from three borings were analyzed.

Total petroleum hydrocarbons were detected in only one soil sample at 6.7 milligram per kilogram (mg/kg) and total petroleum hydrocarbons as diesel, motor oil, and gasoline were not detected in any of the soil samples. Benzene was detected in three soil samples at a maximum concentration of 16 micrograms per kilogram (μg/kg) and carbon disulfide and methyl ethyl ketone were identified in only one soil sample at concentrations of 6 μg/kg and 5.3 μg/kg, respectively. No other volatile organic compounds were detected in any of the soil samples. Cyanide was detected in three soil samples at a maximum concentration of 1.9 mg/kg. Semivolatile organic compounds, PCBs, and chlorinated pesticides were not detected in any of the soil samples. All metals concentrations were less than 100 mg/kg.

Di-n-octyl phthalate was identified in one grab groundwater sample at 200 μg/L and antimony, chromium, and nickel were identified in a groundwater sample at concentrations of 0.013 mg/L, 0.014 mg/L, and 0.086 mg/L, respectively. Total petroleum hydrocarbons as diesel, motor oil, kerosene, and gasoline; volatile organic compounds, MTBE, PCBs, chlorinated pesticides, and cyanide were not detected in any of the groundwater samples.

Permitted Hazardous Materials Uses and Environmental Cases

An environmental database review (Environmental Data Resources 2003) was conducted to identify permitted uses of hazardous materials and environmental cases where soil or groundwater contamination may be present within one-half mile of the Phase 1 facilities. Those databases with sites identified are summarized in Table 3.7-1. This section describes the permitted hazardous materials uses; environmental cases are described in the next section.

The information presented in this analysis is provided by the regulatory agencies and was verified as current as of the publication date of this DEIR.

Permitted Hazardous Materials Uses

Because the use and handling of hazardous materials at permitted sites are subject to strict regulation, the potential for an uncontrolled release of hazardous materials from these sites is low. If there is a documented chemical release, the site is tracked in the environmental databases as an environmental case.

Permitted sites without documented releases are nevertheless potential sources of hazardous materials contamination to the soil or groundwater because of accidental, undetected, or incidental leakage or spillage. Table 3.7-2 summarizes permitted hazardous materials uses within one-half mile of the Phase 1 facilities; site locations are shown on Figure 3.7-1.

As summarized in Table 3.7-2, permitted hazardous materials uses identified include the following:

- Three Resource Conservation and Recovery Act (RCRA)-permitted Small Quantity Generators (SQG)
- One site with a registered Aboveground Storage Tank (AST)

- Two sites with a permitted Underground Storage Tank (UST)
- Six sites with suspected historic USTs (CA FID UST and HIST UST)
- Two sites that have been issued waste discharge requirements
- Eighteen sites for which hazardous waste manifests have been filed with the California Department of Toxic Substances Control (DTSC) (HAZNET)

Five sites identified in the FINDS database. The FINDS database is a compilation of information on facilities included in other, more detailed databases.

Environmental Cases. An environmental database review (EDR 2003) identified environmental cases where soil or groundwater contamination may be present within one-half mile of the Phase 1 facilities. Databases with sites identified are summarized in Table 3.7-1.

Environmental cases, including sites on which release of hazardous materials is suspected or that have had cause for hazardous materials investigations, are identified by one or more regulatory agencies. Identification of hazardous materials at these sites is generally a result of site disturbance activities such as removal or repair of a UST, a release of hazardous materials, or excavation for construction. The status of each environmental case varies and can be active (ongoing investigations or remediation), closed (remediation or cleanup completed and approved by the regulatory agency), or unknown. Environmental cases within one-half mile of the Phase 1 well area are summarized in Table 3.7-2. The location of each site identified is shown on Figure 3.7-1.

As summarized in Table 3.7-2, 9 leaking underground storage tank (LUST) sites (identified in the LUST or CORTESE databases) were identified. These include:

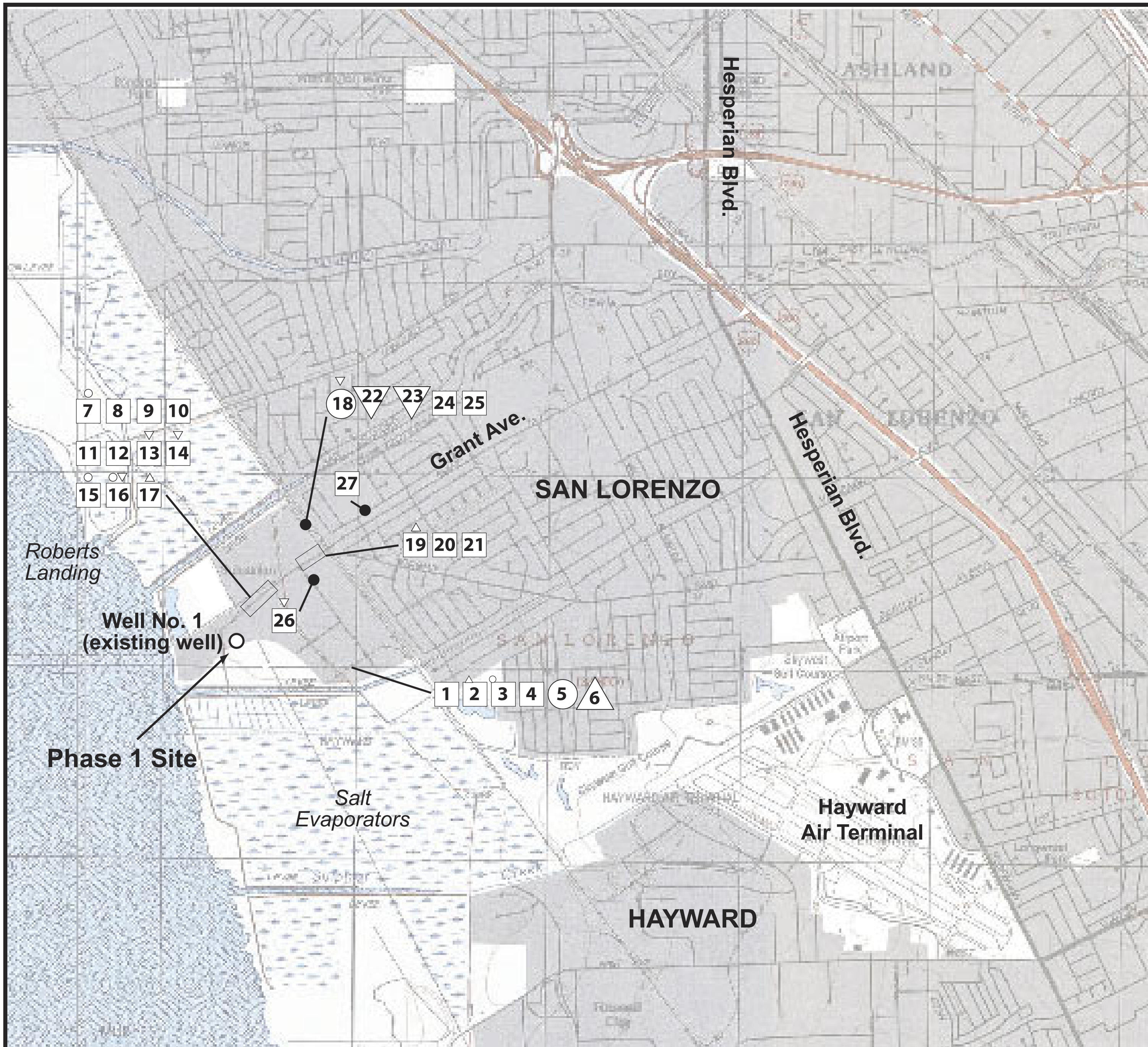
- Gallo Salami at 2411 Baumann Avenue (Site No. 2). A release of gasoline occurred at this site in December 1987. The case has been closed. The database review indicates that groundwater was affected by the release but does not include information regarding any remedial actions taken.
- Military Family Housing located at 15900 Worthley Drive (Site No. 3). This site is included in the CORTESE database and is identified as a LUST site but was not identified in the LUST database.
- Cut & Ready Foods at 16505 Worthley Drive (Site No. 5). A release of gasoline occurred at this site in July 1988. The database indicates that groundwater was affected by the release but does not include information regarding any remedial actions taken and does not indicate that this case has been closed.

CMM & Pacific International at 16525 Worthley Drive (Site No. 6). A release of gasoline occurred at this site in February 1987 and was remediated by removing contaminated soil and pumping and treating the groundwater. This case was closed in December 1998.

TABLE 3.7-1
Description of Environmental Databases

Acronym	Name and Description of Regulatory Database with (Distance Searched)
Permitted Uses	
AST	*Above-Ground Petroleum Storage Tank Facilities.* Facilities with registered aboveground storage tanks (ASTs) (project property and adjacent).
CA FID UST	*California Environmental Protection Agency Facility Inventory Database—Underground Storage Tanks (USTs).* Facilities in a historical listing of active and inactive USTs (within ¼ mile of project property).
FINDS	*Facility Index System.* A database that includes information on facilities included in other more detailed databases (project property and adjacent).
HAZNET	*Hazardous Waste Information System.* Facilities that have filed hazardous waste manifests with the DTSC (project property and adjacent).
HIST UST	*Hazardous Substances Storage Container Database*. Facilities on a historic list of UST sites (within ¼ mile of project property).
RCRIS SQG	*Resource Conservation and Recovery Act Information System Small Quantity Generators*. Facilities permitted to generate more than 100 kilograms per month but less than 1,000 kilograms per month of non-acutely hazardous waste (within ¼ mile of project property).
UST	*Underground Storage Tanks*. Facilities permitted to maintain USTs (within ¼ mile of project property).
WDS	*Waste Discharge System*. Facilities that have been issued waste discharge requirements (project property and adjacent).
Environmental Cases	
CHMIRS	*California Hazardous Materials Incident Reporting System.* Hazardous materials spills and releases reported to the California Office of Emergency Services (project property and adjacent).
CORTESE	*Cortese Hazardous Waste and Substances Site List.* A compilation of sites listed in the Leaking Underground Storage Tank (LUST), Solid Waste Information System (SWF/LF), and CAL-SITES databases (within ½ mile of project property).
ERNS	*Emergency Response Notification System*. These cases are usually spills or releases of chemicals reported to federal authorities (project property and adjacent).
LUST	*Leaking Underground Storage Tanks*. A compilation of leaking underground storage tanks (within ½ mile of project property).
SLIC Reg2	*Spills, Leaks, Investigation, and Cleanup Cost Recovery Listing.* Sites under the jurisdiction of the San Francisco Bay RWQCB (within ½ mile of project property).

Sources: EDR 2003, Orion Environmental Associates.



LEGEND

- □ Permitted hazardous materials use
- ○ Open environmental case
- △ Closed environmental case
- ▽ Spill site

NOTE:
Permitted uses are only shown in vicinity of project area.

N

No Scale

FIGURE 3.7-1 PERMITTED HAZARDOUS MATERIALS USES, ENVIRONMENTAL CASES, AND SPILL SITES

EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

Source: EDR 2003; Orion Environmental Associates

CH2MHILL

169710.26.ZZ_E082003001SFO_Fig 3.7-1 HazMaterials_11/19/04_ccc

TABLE 3.7-2
Permitted Hazardous Materials Uses and Environmental Cases within One-half Mile of the Phase 1 Project Area (Bayside Well No. 1)

				Permitted Uses								Environmental Cases			Spills	
EIR Site Number	**EDR Site No.**	**Site Name**	**Address**	**RCRIS SQG**	**HAZNET**	**AST**	**UST**	**CA FID UST**	**HIST UST**	**FINDS**	**WDS**	**SLIC Reg2**	**LUST**	**CORTESE**	**ERNS**	**CHMIRS**
1	130	Service Manufacturing Co., Inc./ Pacific Utility Auto Body	2400 Baumann Ave.		x											
2	130	Gallo Salame/Galileo Foods	2411 Baumann Ave.		x								c	x		
3	130	Military Family Housing/Pacific Rolling Door Company	15900 Worthley Dr.							x				x		
4	130	Golden West Paper Converting	16500 Worthley Dr.		x											
5	130	Cut & Ready Foods	16505 Worthley Dr.										o	x		
6	130	CMM & Pacific International	16525 Worthley Dr.										c	x		
7	131	Concrete Wall Saw Co., Inc.	2501 Grant Ave.		x							x				
8	131	Trammell/Crow Co.	2509 Grant Ave.	x						x						
9	131	Amador Worldwide Moving and Storage	2521 Grant Ave.		x											
10	131	Friant and Associates	2525 Grant Ave.		x											
11	131	Acme Fixture and Casework, Inc.	2527 Grant Ave.		x											
12	131	Frito-Lay/49814	2539 Grant Ave.		x											
13	118	Cal-Cams	2548 Grant Ave.		x											x
14	131	2561 Grant Ave./Not Reported/Bercovich-Sosnick Candy Co./Pacific American Services, LLC/Frozen Foods Express/EMP	2561 Grant Ave.		x	x		x	x		x				x	x
15	131	Thompson & Thompson Fence	2584 Grant Ave.		x				x				o	x		
16	131	Oro Loma Sanitary District	2600 Grant Ave.		x					x	x		o	x		x
17	131	East Bay Dischargers Authority/EBDA Pump Station O	2651 Grant Ave.		x		x		x				c			
18	110	1000 Railroad Ave./Not Reported/Sherman Trucking	1000 Railroad Ave.											x	x	x
19	118	THARCO	2222 Grant Ave.						x				c	x		
20	118	SMA Equipment Co., Inc.	2333 Grant Ave.		x											

TABLE 3.7-2
Permitted Hazardous Materials Uses and Environmental Cases within One-half Mile of the Phase 1 Project Area (Bayside Well No. 1)

				Permitted Uses								Environmental Cases			Spills	
EIR Site Number	EDR Site No.	Site Name	Address	RCRIS SQG	HAZNET	AST	UST	CA FID UST	HIST UST	FINDS	WDS	SLIC Reg2	LUST	CORTESE	ERNS	CHMIRS
21	118	Fanfa, Inc.	2401 Grant Ave.	x	x				x	x						
22	118	8700 Railroad Ave.	8700 Railroad Ave.												x	
23	118	8800 Railroad Ave.	8800 Railroad Ave.												x	
24	118	Ford Wholesale Co., Inc.	8907 Railroad Ave.						x							
25	118	Miller Pipeline Corp.	8977 Railroad Ave.		x											
26	118	15651 Worthley Dr./Not Reported/Di Salvo Trucking Co.	15651 Worthley Dr.		x		x								x	x
27	113	Life Chiropractic College West	2005 Via Barrett	x	x					x						

Note: "c" indicates closed leaking UST site; "o" indicates open UST site.

AST: Aboveground Petroleum Storage Tank Facilities
CA FID UST: California EPA Facility Inventory Database
CHMIRS: California Hazardous Materials Incident Reporting System
CORTESE: Cortese Hazardous Waste and Substances Site List
ERNS: Emergency Response Notification System
FINDS: Facility Index System
HAZNET: Hazardous Waste Information System
HIST UST: Hazardous Substance Storage Container Database
LUST: Leaking Underground Storage Tank System
RCRIS SQG: Resource Conservation and Recovery Act Information System, Small Quantity Generator
SLIC Reg2: Spills, Leaks, Investigation, and Cleanup Cost Recovery Listing, Region 2
UST: Permitted Underground Storage Tank
WDS: Waste Discharge System

Sources: EDR 2003, Orion Environmental Associates.

- Thompson & Thompson Fence Company at 2584 Grant Avenue (Site No. 15). A release of gasoline occurred at this site in November 1992. The database review indicates that groundwater was affected by the release but does not include information regarding any remedial actions taken and does not indicate that this case has been closed.
- The Oro Loma Wastewater Treatment Plant at 2600 Grant Avenue (Site No. 16). A release of diesel occurred at this site in September 1993. The database indicates that groundwater was affected by the release but does not include information regarding any remedial actions taken and does not indicate that this case has been closed.
- East Bay Dischargers at 2651 Grant Avenue (Site No. 17). A release of gasoline occurred at this site in February 1999. The database does not indicate whether soil or groundwater was affected by this release but states that the case has been closed.
- Sherman Trucking at 1000 Railroad Avenue (Site No. 18). This site is included in the CORTESE database and is identified as a LUST site but was not identified in the LUST database.
- THARCO at 2222 Grant Avenue (Site No. 19). A release of diesel occurred at this site in July 1993. The database indicates that this site has been closed although no information is included regarding soil or groundwater contamination or any remedial actions taken.

The property at 2501 Grant Avenue (Site No. 7) is identified in the SLIC database as under the jurisdiction of the San Francisco Bay RWQCB. The database indicates that this case is inactive and includes no other information regarding soil or groundwater contamination. One spill of 250,000 gallons of treated secondary effluent was reported at the Oro Loma Wastewater Treatment Plant in 2001 and nine additional spills have been reported within one-half mile of the Phase 1 well (ERNS or CHMIRS).

3.7.2.2 Regional Permitted Hazardous Materials Uses, Environmental Cases, and Groundwater Plumes

In 2000, 28 electronic databases from VISTA Environmental Services were reviewed to identify sites that have had a release of hazardous materials or have the potential to have a release in the SEBPB (CH2M HILL 2000). The sites identified by this database review are characterized as sites with permitted hazardous materials uses, LUSTs, landfills, nonleaking USTs that were open cases in 2000 (i.e., the regulatory case file was open, and action was occurring at the site), nonleaking USTs that were closed cases in 2000 (i.e., the regulatory file was closed, and no further action was required at the site), and known regional groundwater plumes identified by the RWQCB. The locations of these sites are shown on Figures 3.7-2 through 3.7-6. EBMUD reexamined the VISTA information in January 2005, and found no changes to the regulatory case files identified in the year 2000 search.

3.7.2.3 Hazardous Materials Regulation

Hazardous materials and hazardous wastes are subject to extensive federal, state, and local regulations for protecting public health and the environment. In general, these regulations define hazardous materials; establish reporting requirements; set guidelines for handling, storage, transport, remediation, and disposal of hazardous wastes; and require health and safety provisions for workers and the public. Regulatory agencies also maintain databases of sites that handle hazardous wastes or store hazardous materials in USTs and of environmental cases where hazardous materials may have been released to the soil or groundwater.

The major federal, state, and regional agencies enforcing hazardous materials' regulations include the U.S. EPA (federal); the DTSC and the SWRCB (state); and the RWQCB and BAAQMD (regional).

Alameda County Environmental Health Services (ACEHS) often acts as lead agency to ensure proper remediation of LUST sites and other contaminated sites in the project area. ACEHS is also responsible for the enforcement of hazardous materials regulations in the unincorporated portions of the project area.

Hazardous Materials Business Plans (HMBPs)

Businesses that handle specified quantities of chemicals are required to submit an HMBP in accordance with community right-to-know laws. This plan allows local agencies to plan appropriately for a chemical release, fire, or other incident. The HMBP must include the following:

- An inventory of hazardous materials with specific quantity data, storage or containment descriptions, ingredients of mixtures, and physical and health hazard information;
- Site and facility layouts that must be coded for chemical storage areas and other facility safety information;
- Emergency response procedures for a release or threatened release of hazardous materials;
- Procedures for immediate notification of releases to the administering agency;
- Evacuation plans and procedures for the facility;
- Descriptions of employee training in evacuation and safety procedures in the event of a release or threatened release of hazardous materials consistent with employee responsibilities, and proof of implementing such training on an annual basis; and
- Identification of local emergency medical assistance appropriate for potential hazardous materials incidents.

Under the Certified Unified Program Agency (CUPA) regulations, ACEHS is responsible for implementing the HMBP requirements in unincorporated areas of Alameda County, such as San Lorenzo.

California Accidental Release Program (CalARP)

CalARP includes regulatory requirements for facilities that handle acutely hazardous materials.[1] Ammonia is a regulated substance under state and federal risk management regulations. Under federal regulations, only solutions with an ammonia concentration greater than 20 percent are regulated. However, CalARP regulations apply to solutions with ammonia concentrations of 1 percent or greater. The federal and state threshold quantities

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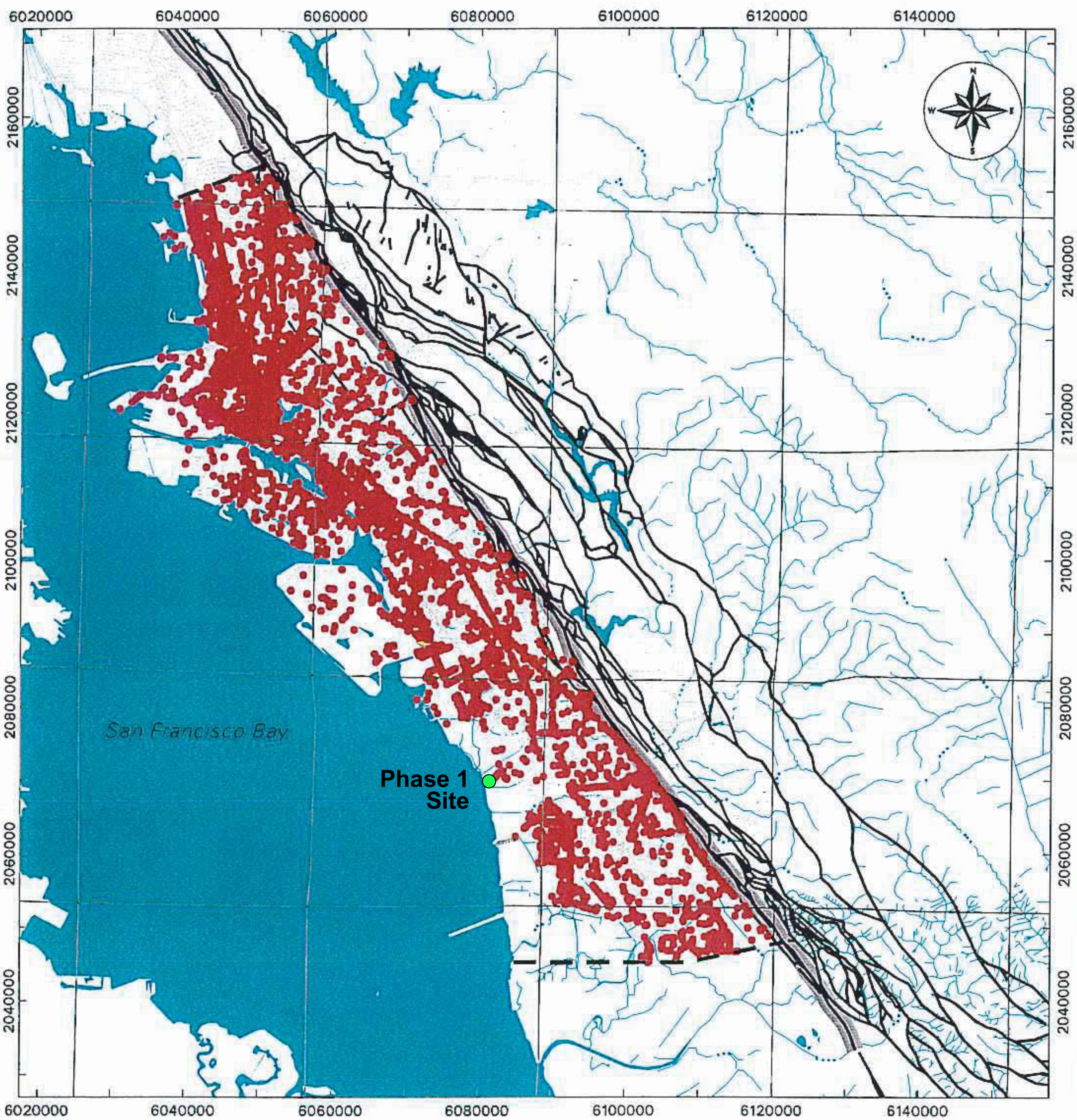
[1] CalARP incorporates the requirements of the Federal Risk Management Program but is more stringent with respect to the threshold quantities of chemicals requiring risk management plans.



Legend:

- Water Bodies
- Highways
- Fault
- Main Trace of Hayward Fault
- Approximate southern limit of EBMUD Service Area
- Study Area Boundary
- Mapped Point (VISTA Dataset)
- Mapped Polygon (VISTA Dataset)
- Phase 1 Site

FIGURE 3.7-2
PERMITTED SITES ON REGULATORY LISTS
SOUTH EAST BAY PLAIN BASIN
VISTA ENVIRONMENTAL DATA
EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

CH2MHILL

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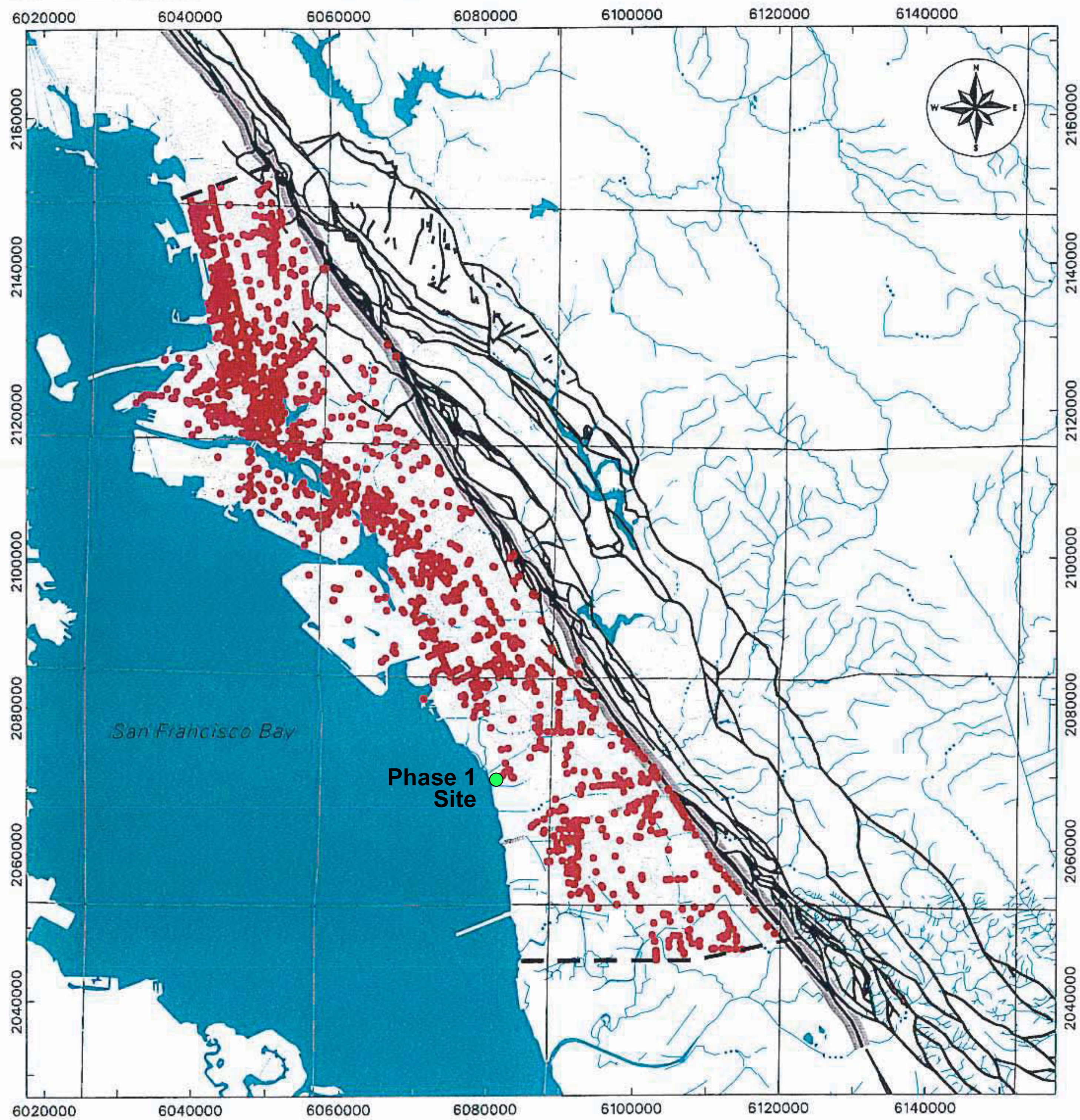

Legend:

Water Bodies

Highways

Fault

Main Trace of Hayward Fault

Approximate southern limit of EBMUD Service Area

Study Area Boundary

Mapped Point (VISTA Dataset)

Mapped Polygon (VISTA Dataset)

Phase 1 Site

0 10000 20000

feet

FIGURE 3.7-3
LEAKING UNDERGROUND STORAGE TANKS (LUSTS)
SOUTH EAST BAY PLAIN BASIN
VISTA ENVIRONMENTAL DATA
EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

CH2MHILL

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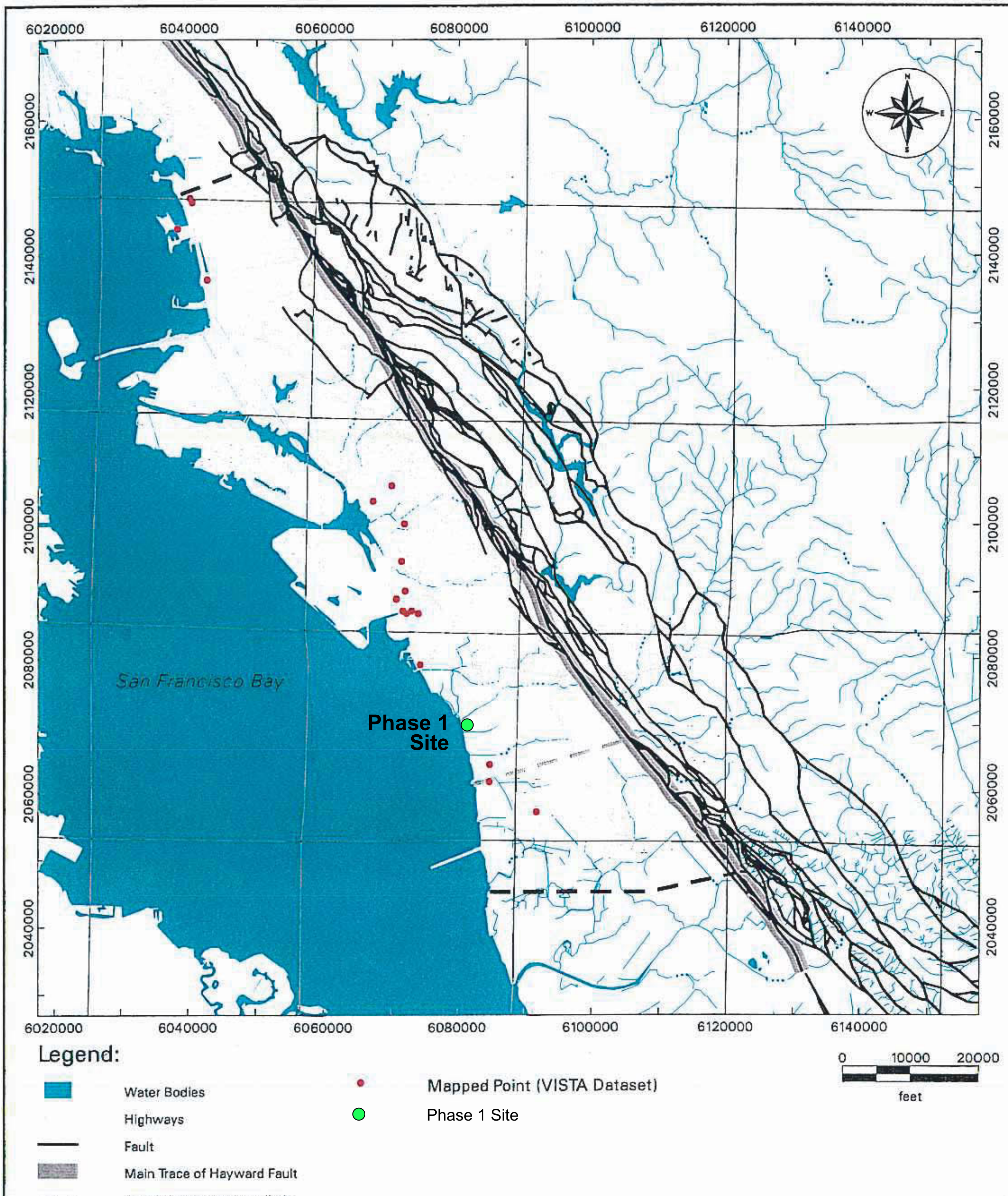

FIGURE 3.7-4
LANDFILLS
SOUTH EAST BAY PLAIN BASIN
VISTA ENVIRONMENTAL DATA
EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

CH2MHILL

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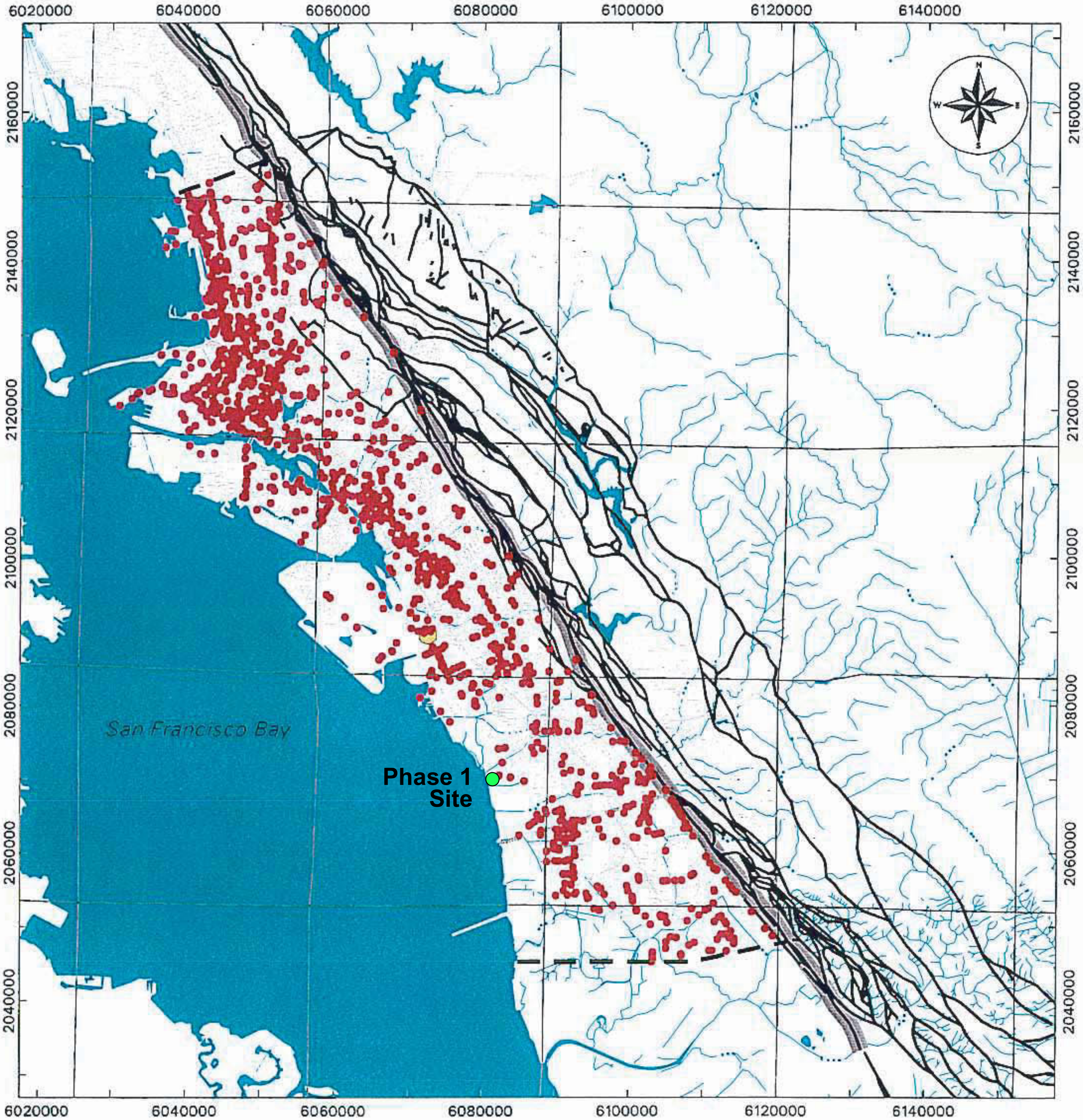

Legend:

- Water Bodies
- Highways
- Fault
- Main Trace of Hayward Fault
- Approximate southern limit of EBMUD Service Area
- Study Area Boundary
- Mapped Point (VISTA Dataset)
- Mapped Polygon (VISTA Dataset)
- Phase 1 Site

FIGURE 3.7-5
NON-UST RELEASE SITES WITH OPEN ISSUES
SOUTH EAST BAY PLAIN BASIN
VISTA ENVIRONMENTAL DATA
EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

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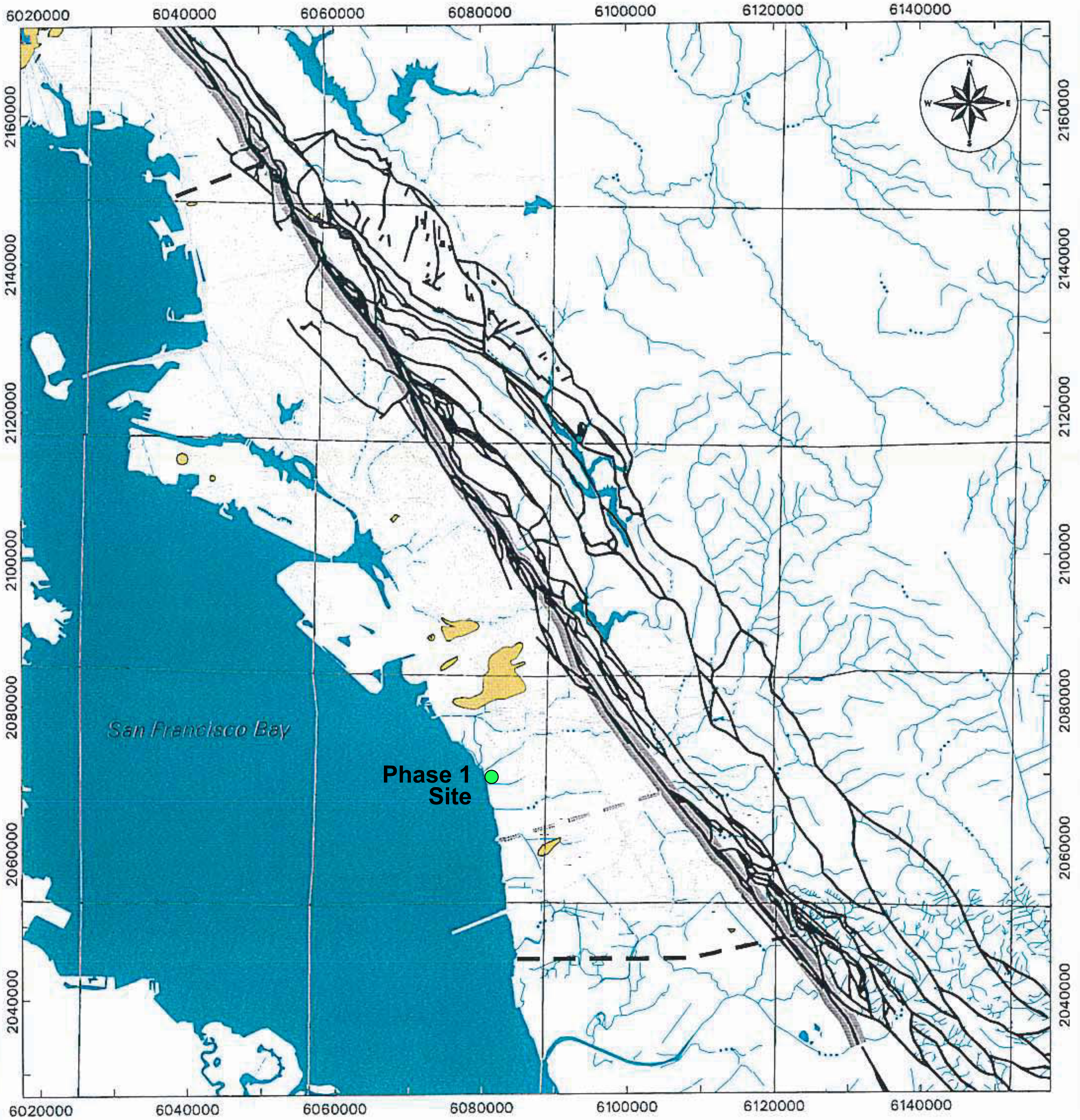

Legend:

- Water Bodies
- Highways
- Fault
- Main Trace of Hayward Fault
- Approximate southern limit of EBMUD Service Area
- Study Area Boundary
- Regional Plumes (RWQCB Dataset)
- Phase 1 Site

0 10000 20000 feet

FIGURE 3.7-6
GROUNDWATER PLUMES LARGER THAN 1000 FEET
SOUTH EAST BAY PLAIN BASIN
VISTA ENVIRONMENTAL DATA
EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

CH2MHILL

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169710.26.ZZ_Fig 3.7-6 _1/26/05_ccc_sfo

for ammonia are 20,000 and 500 pounds, respectively. The Phase 1 chemical storage and handling facility is not subject to the CalARP regulations because the total amount of ammonia stored, 428 pounds, would not exceed a total weight of 500 pounds.

In accordance with CalARP regulations, a Risk Management and Prevention Plan (RMPP) is required for storage of regulated substances, such as ammonia, above threshold quantities. The RMPP includes a hazard assessment to evaluate the potential effects of an accidental release, a program for preventing an accidental release, and a program for responding to an accidental release.

The RMPP is filed with and administered by CUPA, which ensures review by and distribution to other potentially affected agencies.

3.7.2.4 District Policies and Procedures

The subsections below describe the District's policies and procedures related to managing hazardous materials.

District Trench Spoils Field Management Practice Program

The District has established a Trench Spoils Field Management Practice Program (EBMUD 1997) specifying procedures to be implemented prior to and during trenching work by the District to ensure that worker exposure to contaminants of concern is minimized and that trench spoils, including soil and groundwater produced during dewatering, are disposed of properly.

In accordance with this program, all planned trench excavations (those with more than two weeks' advance notice) are investigated prior to starting work. The investigation for all trenching activities includes an environmental database search and a review of site data. Depending on the size and location of the excavation, the investigation may include pre-excavation soil and/or groundwater sampling. Investigations for all planned excavations in industrial areas generating more than 30 cubic yards of material include pre-excavation sampling; investigations for smaller excavations in industrial areas or any jobs in residential and commercial areas may include pre-excavation sampling if the database search or review of site data shows evidence of contamination that could affect construction workers.

The appropriate disposal method for the soil is selected based on the type of area in which trenching was conducted and the analytical results for any samples collected. Trench spoils from all jobs located outside of industrial areas are presumed to be uncontaminated and are disposed of at a District–owned disposal site unless they are thought to be potentially contaminated based on an environmental database review or site observations. The appropriate disposal method for soil produced from large jobs in industrial areas is based on sampling conducted as part of the initial investigation. Soil generated during all small jobs in industrial areas or unplanned small jobs where pre-excavation sampling was not required is stored in bins, and the appropriate disposal method is determined on the basis of samples of the containerized material.

In accordance with the Trench Spoils Field Management Practices Program, groundwater from a trench is considered to be uncontaminated and can be discharged directly to the storm sewer with appropriate sediment control measures. No regulatory permit is required for this discharge.

Groundwater from trenching activities within 250 feet of a known groundwater contamination site must be sampled for metals and volatile organic compounds (typical contaminants of concern) prior to disposal. Groundwater containing chemicals at concentrations less than the state and federal MCLs for drinking water may be discharged to the storm sewer. If chemical concentrations are greater than the MCLs but within prescribed limitations for discharge, the groundwater may be discharged to the sanitary sewer with permission from Oro Loma Sanitation District. If discharge limitations are exceeded, offsite disposal of groundwater from dewatering would be necessary.

EBMUD's Workplace Health and Safety staff is responsible for reviewing the results of investigations to determine appropriate precautions for construction workers, which, in turn, would ensure public health and safety protection. District Environmental Compliance staff would determine appropriate disposal options for excavated soils and dewatered groundwater generated during the excavation.

EBMUD Emergency Operations Plan

The District has prepared an Emergency Operations Plan (EBMUD 1999) outlining procedures to be followed in the event of natural disasters, severe storms, major system failures or terrorist attacks.

Although not all of these potential hazards are present at every site, a site-specific emergency response plan is prepared for individual District facilities, using the Districtwide program as a guide; the plan identifies staff people to perform emergency duties and lists the resources needed to accomplish emergency tasks.

3.7.3 Significance Criteria and Impact Analysis Methodology

The subsections below describe the criteria used to determine whether Phase 1 would create a significant hazard and the methodology used to analyze impacts.

3.7.3.1 Significance Criteria

Consistent with CEQA Guidelines Appendix G, a project would normally have a significant hazard impacts if it would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- Create a significant hazard to the public or the environment through reasonable foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Result in emitting hazardous emissions or handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
- 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, creates a significant hazard to the public or the environment;

- Be located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public-use airport and would result in a safety hazard for people residing or working in the project area;
- Be located within the vicinity of a private airstrip and would result in a safety hazard for people residing or working in the project area; or
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

3.7.3.2 Methodology

Potential hazardous materials impacts for Phase 1 were assessed by evaluating known conditions within the project area and project activities during construction and operation using the significance criteria stated above. Impacts considered but determined to be absent from or not applicable to Phase 1 were identified. Impacts found to be potentially present are then discussed, and where necessary, mitigation measures are identified to reduce these impacts to less than significant levels.

3.7.4 Effects Found to Be Not Significant

The following impacts were considered but were found to be not significant or not applicable to Phase 1; therefore, there is no further discussion of these impacts.

- The Phase 1 area is not located within a safety zone[2] for Hayward Executive Airport (Airport Land Use Commission of Alameda County 1986).
- Phase 1 would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan because project construction and operation would not require any road closures. Thus, there would be no impact for this category.
- The Phase 1 well and associated treatment facilities would not be located within one-quarter mile of a school.
- Wastes that would be produced during operation of the groundwater injection and extraction system include solids settled in the backflush storage tanks and manganese deposits from the catalytic filter if filtration for iron and manganese is required. Neither of these wastes is considered a hazardous waste, and they would be discharged to the sanitary sewer under a permit from the Oro Loma Sanitation District or hauled to the District's wastewater treatment plant**.** Because none of the wastes that would be produced during Phase 1 operation would be considered hazardous, impacts related to the generation and disposal of hazardous waste would be less than significant.
- The wellhead treatment facilities installed for Phase 1 would introduce a new permitted use of hazardous materials and the transport of hazardous materials would increase relative to current conditions. During normal transport operations, there would be potential for accidental release of hazardous materials. However, the facility is located

[2] A safety zone is the zone established at either end of an airport runway where specific land uses and storage of flammable materials are restricted and can subject to review by the Airport Land Use Commission of Alameda County.

within an existing industrial area, adjacent to a wastewater treatment plant and other permitted hazardous materials uses that already require the transportation of hazardous materials. Thus, there would be no significant impact.

- The transport of hazardous materials and wastes is regulated by the California Department of Transportation and the California Highway Patrol. These agencies regulate container types and packaging requirements as well as licensing and training for truck operators, chemical handlers, and hazardous waste haulers. Because of compliance with existing hazardous materials laws and regulations for the transport of hazardous materials, the risk for accidental releases of hazardous materials during normal transport operations is low, and there would be no need for mitigation.

3.7.5 Impacts and Mitigation Measures

3.7.5.1 Construction Impacts

Phase 1 Potential Impact 3.7-1. Possible exposure of construction workers and the public to pre-existing hazardous materials in the soil and groundwater during Phase 1 excavation and dewatering

Phase 1 involves excavating approximately 750 cubic yards of soil to a maximum depth of 6 feet for construction of the wellhead water treatment facilities including the building, filters, tanks, transformer pad, and portable generator pad. Trenching would be required for connection of the existing well to the EBMUD distribution system. If hazardous materials are present in the soil excavated or groundwater generated during dewatering, construction workers and the public could be exposed to the hazardous materials in the soil and groundwater and to chemical vapors during construction. Depending on the nature and extent of the contamination encountered, this could cause adverse health effects and nuisance vapors if proper precautions are not taken. The soil or groundwater may also require disposal as a restricted or hazardous waste.

As discussed in Section 3.7.2.1, Hazardous Materials in Soil and Groundwater, the Phase 1 well (Bayside Well No. 1) and associated facilities are located within an industrial area with historic and current uses of hazardous materials. Ten environmental cases, including one site under the jurisdiction of the RWQCB and nine LUST sites, have been reported within one-half mile of the Phase 1 well site. The closest LUST site is the Oro Loma Wastewater Treatment Plant located immediately to the west.

Based on the number of environmental cases identified, there is the potential to encounter hazardous materials, particularly gasoline or diesel, in the soil and groundwater during construction of the water treatment facilities and trenching for the pipeline connecting the Phase 1 well to the EBMUD distribution system. Specific procedures for handling contaminated soil and groundwater are discussed below.

To evaluate the potential to encounter hazardous materials in the soil and groundwater, the District would conduct a Phase I Environmental Site Assessment, as specified in Mitigation Measure 3.7-1a, for the area where the water treatment facilities would be constructed in accordance with the American Society of Testing Materials (ASTM) established protocols. Based on the results of this Phase I assessment, a Phase II Environmental Site Assessment including soil and groundwater sampling could be required to evaluate soil and groundwater quality at the site.

The District has in place a Trench Spoils Field Management Practice Program (described in Section 3.7.2.4, District Policies and Procedures) that would apply to construction of the pipeline connecting the existing well to the EBMUD distribution system. In accordance with this program, the construction contractor would be required to complete the following activities, as specified in Mitigation Measure 3.7-1b, to assess soil and groundwater quality prior to construction and to provide appropriate plans for worker health and safety requirements and disposal needs:

- Conduct an environmental database review to identify environmental cases in the vicinity of the proposed excavation activities;
- Review data on file with regulatory agencies for all identified environmental cases, including closed cases;
- Conduct pre-excavation sampling of soil and groundwater, as deemed necessary based on review of site conditions as described in the Trench Spoils Field Management Practices Program.
- Review the analytical data to identify appropriate health and safety measures and disposal methods for soil and groundwater according to the methodology described in the Trench Spoils Field Management Practices Program and summarized below.

In compliance with the Trench Spoils Field Management Practices Program, the soil produced during construction of the pipelines would be placed back into the trench excavation.

Disposal methods for any excess soil from construction or trenching activities would be determined based on the results of pre-excavation soil sampling or samples of stockpiled material collected after excavation and would be specified in the material disposal plan required by Mitigation Measure 3.7-1c. Possible disposal methods for the soil include disposal at a District-owned disposal site or at a regulatory permitted Class I, II, or III disposal facility. The materials disposal plan would be prepared by the construction contractor and approved by the District based on analytical results for the wastes.

Groundwater generated during excavation dewatering would be discharged or disposed of in accordance the detailed discharged water control and disposal plan required by the District Trench Spoils Field Management Practices Program and specified by Mitigation Measure 3.7-1d. In accordance with this program, groundwater may be discharged directly to the storm sewer if it is collected from an area more than 250 feet away from a site with groundwater contamination.

For dewatering closer to a groundwater contamination site, the District would require the construction contractor to conduct sampling and select the appropriate disposal method based on these analytical results. The groundwater generated during project construction activities would be discharged to the storm sewer if the chemical concentrations were less than MCLs, or to the sanitary sewer under the District's permit from the Oro Loma Sanitation District if the chemical concentrations are within discharge limitations but greater than MCLs, or hauled to EBMUD's wastewater treatment plant if these limitations are exceeded.

Finally, the contractor would also be required to prepare a contingency plan, as specified in Mitigation Measure 3.7-1e, identifying procedures to be followed in the event that previously unidentified contamination is identified. With implementation of Mitigation Measures 3.7-1a through 3.7-1e requiring site assessments to evaluate the potential to encounter contaminated soil and groundwater as well as preparation of planning documents to identify appropriate disposal methods for soil and groundwater, impacts related to exposure to hazardous materials in the soil and groundwater would be less than significant.

Mitigation Measure 3.7-1a. Retain a qualified professional (e.g., a California Registered Environmental Assessor) to conduct a Phase I environmental site assessment of the Phase 1 area for conformance with standards adopted by the ASTM for Phase I Environmental Site Assessments. If the Phase I Environmental Site Assessment indicates that a release of hazardous materials could have affected soil or groundwater quality at the site, retain a qualified environmental professional to conduct a Phase II Environmental Site Assessment to assess the presence and extent of contamination at the site, in conformance with state and local guidelines and regulations. If the results of the subsurface investigation(s) indicate the presence of hazardous materials, alteration of facility design or site remediation may be required by the applicable state or local regulatory agencies. Final design of proposed facilities will comply with all regulatory requirements for facility design and site remediation.

Mitigation Measure 3.7-1b. Comply with the requirements of the Trench Spoils Field Management Practices Program for all trenching activities. The requirements include an environmental assessment, a sampling program to evaluate the potential for hazardous materials to be encountered in soil and groundwater during construction, and evaluation of soil and groundwater analytical data to identify appropriate health and safety precautions as well as disposal requirements for soil and groundwater produced during trenching. The environmental assessment will be completed within three months of the time of construction to accurately estimate the conditions that could be expected during construction.

Mitigation Measure 3.7-1c. In compliance with the District Trench Spoils Program, prepare a plan specifying the disposal method for soil, the approved disposal site, and written documentation that the disposal site will accept the waste. Prepare and implement a site safety plan detailing measures to be taken to alleviate identified risks. The health and safety plan will identify the chemicals present, potential health and hazards, monitoring to be performed during site activities, soils-handling methods required to minimize the potential for exposure to harmful levels of the chemicals identified in the soil, appropriate personnel protective equipment, and emergency response procedures.

Mitigation Measure 3.7-1d. Prepare a detailed discharged water control and disposal plan detailing requirements for containment and discharge of rainwater and groundwater produced from excavations and use of wash water. The discharge plan shall include requirements for testing and disposal of such liquid. Comply with regulations of the RWQCB, CDFG, ACFCD, and other regulatory agencies having jurisdiction.

Mitigation Measure 3.7-1e. Develop a contingency plan for sampling and analysis of potential hazardous materials and for coordination with the appropriate regulatory agencies in the event that previously unidentified hazardous materials are encountered during construction. If hazardous materials are identified, modify the health and safety plan to include the new data, conduct sampling to assess the chemicals present, and identify appropriate disposal methods. Perform site investigations or remedial activities in accordance with applicable laws. Typically, the ACEHS would be the responsible agency in San Lorenzo. The RWQCB or DTSC or both could be involved if groundwater, surface water, or soil is contaminated.

Impact Significance: Less than significant after mitigation

3.7.5.2 Operational Impacts

Phase 1 Potential Impact 3.7-2. Accidental release of water treatment chemicals during transport, handling, or storage

The chemicals proposed to be used and stored at the wellhead treatment facility are summarized in Table 3.7-3. These are all chemicals typically used at water treatment facilities. They are selected by the industry to provide necessary water treatment and public health benefits while minimizing the public health risks associated with their transport, storage, and use. Sodium hypochlorite and ammonia are incompatible chemicals and could react if mixed during a release.

TABLE 3.7-3
Proposed Phase 1 Chemical Storage

Chemical Name	Use	Proposed Storage
Caustic Soda (Sodium Hydroxide)	pH control	One 1,000-gallon tank
Sodium Hypochlorite	Chlorination and disinfection	One 1,500-gallon tank
Fluoride (Hydrofluorosilic Acid)	Fluoridation	One 400-gallon tank
Ammonia (Ammonium Hydroxide)	Chloramination and disinfection	One 300-gallon tank
Sodium Bisulfite	Dechlorination	One 300-gallon tank

The Uniform Fire Code (UFC), Article 80 (International Fire Code Institute 1997), includes specific requirements for the safe storage and handling of hazardous materials. These requirements reduce the potential for a release of hazardous materials and mixing of incompatible materials that could pose a public health or water quality risk. The design of the wellhead treatment facility will incorporate up-to-date chemical storage and handling facilities in compliance with the current UFC and other applicable federal, state, and local regulations. Following is a list of specific design features of the proposed building that reduce the potential for a release of hazardous materials that could affect public health or the environment:

- Separation of incompatible materials with a noncombustible partition;
- Spill control in all storage, handling, and dispensing areas; and
- Separate secondary containment for each chemical storage system. The secondary containment would hold the entire contents of the tank plus the volume of water for the fire suppression system that could be used for fire protection for a period of 20 minutes in the event of a catastrophic spill.

Incorporation of these design features would reduce the potential for spills resulting from the storage and handling of hazardous materials that would be used at the wellhead treatment facility.

In addition, the District would be required by the ACEHS to prepare a Hazardous Materials Business Plan (HMBP) for the storage and handling of hazardous materials at this site, and a risk management plan would be required if the quantity of ammonia stored exceeds the 500 pound threshold quantity for CalARP. The plans would incorporate District emergency response procedures; the District currently has a general emergency response plan, and a site-specific procedure will be developed for the Phase 1 facilities.

Construction in accordance with applicable laws and regulations as specified in Mitigation Measure 3.7-2a and preparation of an HMBP with a site-specific emergency response plan as specified in Mitigation Measure 3.7-2b would reduce impacts associated with the use and storage of chemicals to less than significant.

Mitigation Measure 3.7-2a. Construct chemical storage areas in accordance with the UFC. The UFC requires that chemical storage areas be constructed with secondary containment adequate to retain a release of the contents of the largest single tank or container plus a volume based on the design flow rate of the automatic fire-extinguishing system for the area. It also requires that incompatible chemicals (such as acids and bases) be physically separated (International Fire Code Institute 1997).

Mitigation Measure 3.7-2b. Prepare an HMBP for Phase 1 facilities. The plan will discuss handling and storage, including containment, site layouts, and emergency response and notification procedures for a spill or release from the tanks, and will include site-specific emergency response procedures prepared in accordance with the District's program plan.

Impact Significance: Less than significant after mitigation

3.7.6 References – Hazards

Airport Land Use Commission of Alameda County. 1986. *Alameda County Airport Land Use Policy Plan.* Adopted July 16.

California Code of Regulations. 2004. Title 14. Chapter 3: "Guidelines for Implementing the California Environmental Quality Act."

California Health and Safety Code. 2004.

CH2M HILL. 2000. *Regional Hydrogeologic Investigation, South East Bay Plain.* January.

EBMUD. 1997. *Field Management Practice and Plan for the Screening and Disposal of Trench Spoils*, April.

EBMUD. 1999. *Emergency Operations Plan, Basic Plan*. April.

The Denali Group. 2000. Phase II Environmental Site Assessment APN 438-10-8-1, Grant Avenue, San Lorenzo CA. April.

Environmental Data Resources. 2003. *The EDR Area Study Report, Study Area Bayside Groundwater Project, San Lorenzo, CA, 94580*. July 9.

International Fire Code Institute. 1997. Uniform Fire Code.

3.8 Phase 1 Traffic and Transportation

This section describes potential impacts and mitigation measures related to traffic and transportation for Phase 1 of the project.

3.8.1 Approach to Analysis

This evaluation is based on review of local transportation plans and policies, traffic counts, and analysis of roadway and intersection levels of service.

3.8.2 Setting

The subsections below describe the traffic and transportation elements of the Phase 1 project setting.

3.8.2.1 Roadways

Grant Avenue leads directly into the OLSD treatment plant and the Phase 1 site. No other roadways pass through or adjacent to the Phase 1 site. Interstate Route 880 (I-880), approximately 2.5 miles from the Phase 1 site, is the nearest freeway.

3.8.2.2 Transit Service

The Bay Area Rapid Transit (BART) system's Bayfair station is located on Hesperian Boulevard north of Grant Avenue, approximately three miles away from the Phase 1 site.

3.8.2.3 Bicycle Facilities

A Class I bicycle path (a path with exclusive rights of way) is located at the western edge of San Leandro. This multiuse path along the Bay meanders through the marsh at the end of Bayfront Drive and is part of the Bay Trail. A Class II bicycle lane (a path along the curb lane of a street or highway) is located along both sides of Grant Avenue, from Washington Avenue/Via Alamitos to the western terminus of Grant Avenue (Bates 2005).

3.8.3 Project Conditions

This section analyzes traffic operating conditions with the addition of Phase 1-related construction traffic.

3.8.3.1 Local Traffic Evaluation

The three primary sources of construction traffic for Phase 1 would be worker trips, truck trips, and site inspection trips. Approximately 10 construction worker trips, eight truck trips, and two site-inspection trips would be expected each day during construction. As discussed in Section 2.5 (Project Construction), approximately 12 months are necessary to complete Phase 1 construction, which includes site preparation, the rehabilitation of Bayside Well No. 1, and installation of piping from the well to the Grant Avenue pipeline. These trips would be made to the Phase 1 site via I-880 and Grant Avenue. No lane closures would be expected on Grant Avenue during construction.

3.8.3.2 Regional Traffic Evaluation

Hesperian Boulevard and I-880 are Congestion Management Program (CMP) routes designated by the Alameda County Congestion Management Agency (ACCMA). The ACCMA threshold requirement, above which an analysis of a project's impact on the CMP roadway system would be required, is 100 PM peak-hour trips more than existing conditions for projects consistent with the General Plan (ACCMA 1999). This threshold is typically applied to projects after construction. Phase 1 would only generate at most one or two peak-hour trips during operation, so no regional roadway system analysis is required.

3.8.4 Significance Criteria

Consistent with CEQA Guidelines Appendix G, a project would normally have a significant impact upon traffic and transportation if it would:

- Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., results in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections);
- Exceed, either individually or cumulatively, a level-of-service standard established by the county congestion management agency for designated roads or highways;
- Result in a change in traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
- Substantially increase hazards because of a design features (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- Result in inadequate emergency access;
- Result in inadequate parking capacity; or
- Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

3.8.5 Effects Found to be Not Significant

As described above, construction of Phase 1 would generate an estimated 18 vehicle trips per day. Operation of the Proposed Project would generate occasional vehicle trips by delivery and operations and maintenance vehicles. These trips would result in an inconsequential number of additional traffic (peak or non-peak hour) in the local area and would not result in any traffic safety hazards. Existing parking areas at the OLSD treatment plant are sufficient to accommodate parking during construction and operation. No roadways or other transportation features would be affected by construction or operation of Phase 1. Thus no transportation impacts are anticipated and no mitigation for traffic impacts would be required.

3.8.6 References – Traffic and Transportation

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3.9 Phase 1 Noise

The subsections below address potential noise impacts and mitigation measures related to Phase 1 of the project.

3.9.1 Approach to Analysis

This analysis uses typical equipment noise levels to estimate temporary Phase 1 construction-related noise impacts, especially as they affect sensitive receptors. These estimates are compared with community noise ordinance restrictions and speech/sleep interference criteria. To evaluate long-term, operation-related impacts, this analysis estimates noise increases from Phase 1-related sources, compares them to ambient noise conditions in the vicinity of each facility, and assesses their significance according to community noise ordinance standards.

3.9.1.1 Environmental Acoustics

Noise impacts are usually caused by human activity that increases the accustomed acoustical intensity of a locale, usually at a time of day or for a duration that disrupts normal activities or that diminishes the quality of the environment. Sources that could temporarily increase ambient noise levels within neighborhoods would be those associated with Phase 1 construction equipment.

3.9.1.2 Noise Definitions

Several weighting scales are used to measure noise levels. The basic unit of measurement that indicates the relative amplitude of sound is the decibel (dB). The zero on the dB scale is based on the lowest sound level that a healthy, unimpaired ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 dB represents a ten-fold increase in acoustic energy, while an increase of 20 dB is 100 times more intense, an increase of 30 dB is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10 dB increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities.

There are several methods of characterizing sound. The most common is the A-weighted dB (dBA). This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy equivalent sound/noise descriptor is called equivalent noise level (L_{eq}). The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration. Table 3.9-1 shows typical A-weighted noise levels measured in the environment and in industry (Baraneck 1988).

Because sensitivity to noise increases during the evening and at night—since excessive noise interferes with the ability to sleep—24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The Community Noise Equivalent Level (CNEL) is a measure of the cumulative noise exposure in a community with approximately 5dB penalty added to evening (7:00 pm to 10:00 pm) and a 10 dB addition to nocturnal (10:00 pm to 7:00 am) noise levels. The day/night average sound

TABLE 3.9-1
Typical Sound Levels Measured in the Environment and Industry

Noise Source at a Given Distance	A-Weighted Sound Level in Decibels[a]	Noise Environments	Subjective Impression
	140		
Civil defense siren (100 ft)	130		
Jet takeoff (200 ft)	120		Pain threshold
	110	Rock music concert	
Pile driver (50 ft)	100		Very loud
Ambulance siren (100 ft)			
	90	Boiler room	
Freight cars (50 ft)		Printing press plant	
Pneumatic drill (50 ft)	80	In kitchen with garbage	
		disposal running	
Freeway (100 ft)	70		Moderately loud
Vacuum cleaner (10 ft)	60	Data processing center	
Department store			
Light traffic (100 ft)	50	Private business office	
Large transformer (200 ft)	40		Quiet
Soft whisper (5 ft)	30	Quiet bedroom	
	20	Recording studio	
	10		
	0		Threshold of hearing

Note:
[a] A-Weighted Sound Level, dB: The A-weighted filter de-emphasizes very low and very high frequency components of sound similar to the response of the human ear. All sound levels in this DEIR are A-weighted.
Source: Baraneck 1988.

level (Ldn) is essentially the same as CNEL without applying any penalty to noise events occurring in the evening time period.

3.9.1.3 Effects of Noise

Planning for acceptable noise exposure must take into account the types of activities and corresponding noise sensitivity in a specified location for a generalized land use type. Some general guidelines (U.S. EPA 1974) are as follows: sleep disturbance may occur at levels above 35 dBA, interference with human speech begins at around 60 dBA, and hearing damage may result from prolonged exposure to noise levels in excess of 85 to 90 dBA.

3.9.2 Setting

The subsections below describe the acoustical setting for Phase 1.

3.9.2.1 Existing Noise Environment

The primary sources of noise in the study area include traffic on I-880 to the east of the Phase 1 area as well as on Grant and Washington Avenues. In the portion of the study area near the Phase 1 site, significant intermittent noise sources include overflying aircraft (mostly on approach to Oakland International Airport), railroad operations along the UPRR tracks, and vehicle movements from stacking and loading activities at the Oakland Palette Company. Transportation-related noises can occur at any time, night or day. Pallete Company noises are typically confined to weekday business hours.

3.9.2.2 Existing Noise Levels

In order to characterize the current noise environment in the project area, short- and long-term noise measurements were taken on November 9 and 10, 2000. These measurements are presented in Table 3.9-2. They are representative of current conditions because analysis of aerial photographs and land uses indicates no significant changes in land use have occurred since 2000. Transportation-generated noises (air, rail, vehicle) still predominate. Because residential uses are the most noise-sensitive uses in the project area, measurement locations were selected to characterize the ambient noise environments in the neighborhoods near the industrial area where Phase 1 facilities would be located.

Noise measurement locations are shown in Figure 3.9-1. Measurements indicate that existing noise levels in residential neighborhoods north and east of the project area generally range between 60 and 62 dBA (CNEL) away from major streets but in the vicinity of the UPRR tracks. The primary sources of noise in these residential areas are overflying aircraft associated with Oakland Airport and UPRR operations. Short-term (15 minute) measurements taken at locations "A" and "B" shown on Figure 3.9-1 indicate that higher daytime noise levels of 64 to 66 dBA (L_{eq}) occur at 75 feet from the centerlines of Grant Avenue and Lewelling Boulevard, which coincides with the front facades of most residences.

3.9.2.3 Sensitive Receptors

Certain land uses, such as residences, schools, childcare centers, churches, hospitals, and nursing homes, are considered to be sensitive receptors. No such uses are found adjacent to any of the proposed Phase 1 facilities. Natural recreation areas, such as the Bay Trail, located approximately 1,000 feet from Phase 1 facilities, require some degree of quiet for passive recreational uses. The closest residences are located approximately 2,100 feet to east of proposed facilities (east of the UPRR tracks).

As described in Section 3.4.3, clapper rails are known to breed in Central and South San Francisco Bay and have been reported in the marsh at the mouth of San Lorenzo Creek during the breeding season. Black rails are most likely to be found in the emergent tidal marsh at the mouth of San Lorenzo Creek in the non-breeding season (August-February) (Evens 2001). Construction noise, particularly percussive noise from pile driving, has a high impact on rails. There are no available data to establish the maximum noise levels that the black and clapper rail can sustain without being significantly affected. These birds are assumed to be as sensitive as other vertebrates to high noise levels, with percussive noise inducing the most stress (Evens 2001).

TABLE 3.9-2
Summary of Noise Measurement Results

Time	Hourly Noise Level (L_{eq}) in dBA		
	Measurement Location 1[a]	Measurement Location 2[b]	Measurement Location 3[c]
12:00–1:00 AM	51.6	46.5	49.8
1:00–2:00 AM	51.7	47.3	49.8
2:00–3:00 AM	50.9	47.4	51.4
3:00–4:00 AM	50.6	50.6	50.8
4:00–5:00 AM	52.6	52.0	54.8
5:00–6:00 AM	51.2	49.0	53.1
6:00–7:00 AM	51.2	50.2	51.4
7:00–8:00 AM	53.5	51.4	55.3
8:00–9:00 AM	57.3	52.5	56.0
9:00–10:00 AM	55.1	55.7	60.1
10:00–11:00 AM	53.9	55.4	56.7
11:00 AM–12:00 PM	54.0	56.9	57.9
12:00–1:00 PM	54.7	58.2	57.1
1:00–2:00 PM	55.0	61.4	59.3
2:00–3:00 PM	60.8	63.6	58.3
3:00–4:00 PM	62.7	54.7	59.2
4:00–5:00 PM	60.3	61.6	61.9
5:00–6:00 PM	60.2	54.0	61.7
6:00–7:00 PM	57.0	51.6	55.8
7:00–8:00 PM	57.1	53.8	56.3
8:00–9:00 PM	56.7	53.7	56.3
9:00–10:00 PM	58.2	57.1	57.6
10:00–11:00 PM	58.5	53.8	57.2
11:00 PM–12:00 AM	58.1	53.8	56.2
Day L_{eq} (7:00 AM–7:00 PM)	**58.2**	**58.2**	**58.8**
Evening L_{eq} (7:00 PM–10:00 PM)	**57.4**	**55.2**	**56.8**
Night L_{eq} (10:00 PM–7:00AM)	**54.1**	**50.8**	**53.5**
CNEL	**61.8**	**59.6**	**61.5**

Notes:

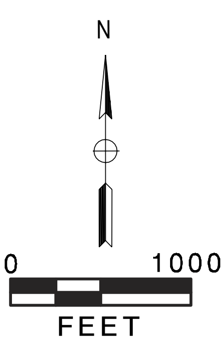
Measurements were taken from 2:00 PM on Thursday, November 11 to Friday, November 12, 2000. Noise measurements were taken using Metrosonics DB-308 meters at the following locations:

[a] Location 1 was approximately 40 feet west of the end of Seacrest Court.

[b] Location 2 was adjacent to San Lorenzo Creek, approximately 350 feet east of the UPRR tracks.

[c] Location 3 was in San Lorenzo Park, approximately 500 feet east of the UPRR tracks and immediately south of homes on Bandoni Avenue.

Source: EBMUD 2001.



Source: EBMUD 2001

FIGURE 3.9-1
NOISE MEASUREMENT LOCATIONS
EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
DRAFT EIR

CH2MHILL

169710.26.ZZ•Fig 3.9-1 Noise Measure_11/19/04_CCC_SFO

3.9.2.4 Regulatory Framework

Because Phase 1 facilities would be located in an unincorporated area of Alameda County, Phase 1 would be subject to construction-related and operational noise limits specified in the Alameda County noise ordinance (1966). Section 6.60.070.E of this noise ordinance does not specify noise levels for construction activities but limits such activities to the hours of 7:00 am to 7:00 PM on weekdays and 8:00 am to 5:00 pm on weekends. With respect to operational noise, Section 6.60.040 specifies exterior noise limits at various land uses. These standards are presented in Table 3.9-3.

TABLE 3.9-3
Alameda County Maximum Allowable Noise Levels at Receiving Land Uses

Receiving Land Use	Cumulative Number of Minutes in 1-Hour Time Period	Noise Level Standard for Specified Land Uses Maximum Allowable Noise Level Standard, dBA	
		Daytime 7:00 am to 10:00 pm	Nighttime 10:00 pm to 7:00 am
Residential, School, Hospital, Church, or Public Library Properties	30	50	45
	15	55	50
	5	60	55
	1	65	60
	0	70	65
Commercial Properdines	30	65	60
	15	70	65
	5	75	70
	1	80	75
	0	85	80

Section 6.60.040.B indicates that the applicable standard must be raised to equal the measured ambient noise level if the measured level exceeds the applicable standard. In addition, Section 6.60.040.C states that standards must be reduced by 5 dBA for simple tone noises or recurring impulsive noises. The above exterior noise limits convert to the L_{eq} and CNEL noise limits listed in Table 3.9-4.

To assess long-term or operational changes in the ambient noise environment associated with Phase 1, this analysis compares projected noise levels at the receiving land use with applicable exterior noise limits specified by the Alameda County noise ordinance (listed in Table 3.9-4: 58 L_{eq} during the day and 53 L_{eq} during the night). These County noise limits correlate well to the measured ambient levels (58 L_{eq} during the day and 54 L_{eq} during the night). Because the existing/proposed well would include a transformer, which generates simple tones, the nighttime standard applied at the well site was reduced by 5 dBA to 48 L_{eq} in accordance with Section 6.60.040.C of the ordinance.

3.9.3 Significance Criteria and Impact Analysis Methodology

The subsections below describe the significance criteria and impact analysis methodology related to noise for Phase 1.

TABLE 3.9-4
Alameda County Exterior Noise Standards

		Noise Level Limit, in dBA			
Maximum Time (Minutes per Hour)	Model Duration (Minutes per Hour)	Day (7:00 am to 7:00 pm)	Evening (7:00 pm to 10:00 pm)	Night (10:00 pm to 7:00 am)	CNEL
Residential, School, Hospital, Church, or Public Library Uses					
30	30	50	50	45	
15	15	55	55	50	
5	10	60	60	55	
1	4	65	65	60	
0	1	70	70	65	
		58	58	53	61
Commercial Uses					
30	30	65	65	60	
15	15	70	70	65	
5	10	75	75	70	
1	4	80	80	75	
0	1	85	85	80	
		73	73	68	76

3.9.3.1 Significance Criteria

Consistent with CEQA Guidelines Appendix G, a project would normally have a significant noise impact if it would result in:

- Exposure of persons to or generation of noise levels in excess of standards established in the Alameda County Noise Ordinance or applicable standards of other agencies,
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels,
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project, or
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity.

3.9.3.2 Methodology

Construction noise generation potential (under mitigated and unmitigated conditions) is based on U.S. EPA (1971) noise levels specified for various types of equipment. Operational noise generation potential of the proposed well's pump is based on Bruce and Moritz (1997) reference noise levels.

To evaluate Phase 1's construction-related noise impacts, this analysis uses speech interference criteria to assess the impacts of daytime construction noise and sleep interference criteria to evaluate the impacts of nighttime construction. Impacts are also evaluated relative to duration and time of day to identify substantial increases in noise resulting from temporary construction activities. Noise peaks generated by construction equipment could result in speech interference in adjacent buildings if the noise level in the interior of the building exceeds 45 to 60 dBA (L_{eq}).[1] Assuming a 25 dBA reduction with the windows closed, an exterior noise level of 70 dBA (L_{eq}) at receptors would maintain an acceptable interior noise environment of 45 dBA. It is important to note that construction noise would be sporadic rather than continuous because different types of construction equipment would operate throughout the construction process, therefore construction noise estimates should be considered to be conservative.

Sleep interference could result if the interior noise level of a building exceeds 35 dBA (L_{eq}). Noise levels in a typical building can be reduced by 25 dBA when the windows are closed (U.S. EPA 1974). In some cases, this noise reduction could be maintained only on a temporary basis because it assumes windows must remain closed at all times. Assuming a 25 dBA reduction with the windows closed, an exterior level of 60 dBA (L_{eq}) would maintain an acceptable interior environment for sleep (35 dBA).

3.9.4 Effects Found to be Not Significant

The following impacts were considered and found to be not significant or not applicable to Phase 1; therefore, there is no further discussion of these impacts.

Increased ambient noise levels from operation of proposed facilities at Well No. 1. Operational noise increases would derive from a 200-horsepower (Hp) vertical turbine pump, motorized valves, and a transformer, all proposed to be enclosed at the Bayside Well No. 1 facility. As indicated in Table 3.9-5, the combined noise level for the equipment is estimated at 47 dBA at 50 feet. Table 3.9-5 also indicates that Alameda County noise ordinance standards could be met at this well site, for both daytime and night hour ambient conditions, with the wellhead and transformer enclosed, as described in Section 2.4.1 of this DEIR.

Pumps within the wellhead treatment facility would also be a source of noise at the Phase 1 site. However, these pumps are substantially smaller than the well pump and are enclosed in a building. Therefore, potential noise increases associated with operation of these small pumps would be less than estimated noise levels for the larger, vertical turbine pump associated with the well. Under worst-case conditions, if these pumps generated the same noise level as the much larger, 200-Hp well pump, operation of these pumps would also meet Alameda County noise ordinance standards.

Increased ambient noise levels from installation of monitoring wells. As described in Section 2.4.1.2, Phase 1 would include a project monitoring well network to collect data. The network would use existing and new wells; several new wells are planned for installation (see Figure 2-6). The new wells would require only a few days of drilling to install, and drilling activities would only occur during daytime hours. Although all monitoring well locations have not been finalized, all are expected to be at least 200 feet from residences or other sensitive receptors. All drilling activities will comply with local noise ordinances. Therefore, noise from installation of the new monitoring wells would be temporary, and impacts would be less than significant. No change in ambient noise levels is anticipated from monitoring well operation.

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

3.9.5 Impacts and Mitigation Measures

The following noise impact assessment analyzes Phase 1-related construction and operational noise generation potential, estimates potential noise increases at the nearest sensitive receptors, and evaluates the significance of these increases by comparing Phase 1 noise levels to applicable noise standards and significance criteria.

3.9.5.1 Construction Impacts

Phase 1 Potential Impact 3.9-1. Construction of Phase 1 facilities resulting in temporary noise increases at nearby noise-sensitive residential receptors

Typical construction equipment generates noise levels ranging from about 76 to 88 dBA at a distance of 50 feet from the source, with slightly higher levels of about 88 to 91 dBA for certain types of earthmoving and impact equipment. Table 3.9-6 indicates noise levels at 25, 50, and 100 feet from the noise source for typical construction equipment.

TABLE 3.9-5
Estimated Maximum Operational Noise Levels at Nearby Receptors for Phase 1

Maximum Noise Source	Reference Hourly L_{eq} in dBA at 50 feet[a]	Minimum Distance	Distance Adjustment[b]	Adjusted L_{eq} in dBA	Applicable Noise Standard[c]	Exceeds Standard?
Pump and Transformer (enclosed)	47.3	2,100	-22	31	Day: 58 Night: 48	No No

Notes:

Estimates are for the proposed Phase 1 Bayside Well No. 1, where the closest residential receptors are 2,100 feet to the east.

[a] Pump reference noise levels at well facility assume simultaneous operation of one 200-Hp vertical turbine pump (72 dBA) and one PG&E transformer (52 dBA). The combined noise level would be 72.1 dBA if the well pump is above ground and the transformer is not enclosed. If pumps and transformers are enclosed, the combined noise level would be 47 dBA (25 dBA lower than the combined unenclosed noise level). L_{eq} noise levels assume simultaneous operation of one 200-Hp submersible vertical turbine pump (47 dBA) and one PG&E transformer (36 dBA) (Bruce and Moritz 1997). To evaluate worst-case conditions, this analysis assumes the above-listed equipment would operate simultaneously 24 hours per day and all equipment would be located at the project boundary closest to the receptor. It also assumes that no reduction is applied to any intervening development that interrupts the line of sight between the noise source and receptors. Estimated noise levels are based on a reference noise level of 69 dBA (L_{eq}) for a 1,800-rpm, 100-Hp pump. This level was adjusted for the proposed Hp rating of proposed pumps to establish an average pump noise level (L_{eq}) as follows: $L_{eq\,1} = L_{eq\,R} + K * \log;$ (HP_1/HP_R) are the horsepower ratings of the candidate and reference pumps, and K is a pump constant. Pump and transformer noise levels were obtained from Bruce and Moritz 1997.

[b] The distances represent the minimum distance between the receptor and the closest facility construction location. Noise levels at more distant residences along referenced streets would be lower because noise levels decrease about 6 dBA for every doubling of distance from a point source (such as the proposed water facilities).

[c] The applicable noise standard is from the Alameda County Noise Ordinance for residential, school, church, or hospital receiving land uses. However, because the measured ambient noise level is higher than the standard, the standard has been adjusted to be equal to the measured day and night L_{eq} noise levels. The adjusted night standard is 5 dBA less than the night standard to adjust for simple tone noises such as noise generated by a transformer.

Phase 1 facilities would be located within the industrial area along the west end of Grant Avenue. Bayside Well No. 1 is located south of Grant Avenue; the closest residential receptors are located approximately 2,100 feet to the east (east of the UPRR tracks). As shown in Table 3.9-7, maximum noise levels associated with facility construction would not exceed the speech interference criterion at the closest residential receptors. The 2,100-foot setback distance of the closest residential receptors would be sufficient to also maintain noise levels at less than significant levels when compared to Alameda County noise ordinance standards. Therefore, construction-related noise impacts on the closest residential receptors would be less than significant.

Impact Significance: Less than significant

Phase 1 Potential Impact 3.9-2 Potential disturbance of nesting birds by construction of Phase 1 facilities

As described in Section 3.4.3 of this document, the western portion of Bockman Canal is not critical rail habitat but may have secondary value for temporary refuge. Construction noise,

TABLE 3.9-6
Noise Levels and Abatement Potential of Construction Equipment Noise at 25, 50, and 100 Feet

	Noise Level at 25 Feet in dBA		Noise Level at 50 Feet in dBA		Noise Level at 100 Feet in dBA	
Equipment	**Without Controls**	**With Controls**	**Without Controls**	**With Control**	**Without Controls**	**With Controls**
Earthmoving						
Front Loader	85	81	79	75	73	69
Backhoe	91	81	85	75	79	69
Dozer	86	81	80	75	74	69
Tractor	86	81	80	75	74	69
Grader	91	81	85	75	79	69
Truck	97	81	91	75	85	69
Materials Handling						
Concrete Mixer	91	81	85	75	79	69
Concrete Pump	88	81	82	75	76	69
Crane	89	81	83	75	77	69
Derrick	94	81	88	75	82	69
Stationary						
Pump	82	81	76	75	70	69
Generator	84	81	78	75	72	69
Compressor	87	81	81	75	75	69
Impact						
Pile Driver	107	101	101	95	95	89
Rock Drill	104	86	98	80	92	74
Jack Hammer	94	81	88	75	82	69
Pneumatic Tool	92	86	86	80	80	74
Other						
Saw	84	81	78	75	72	69
Vibrator	82	81	76	75	70	69

Note:
Estimated levels would be obtainable by selecting quieter procedures or machines and implementing noise control features requiring no major redesign or extreme cost (e.g., improved mufflers, equipment redesign, use of silencers, shields, shrouds, ducts, and engine enclosures).
Source: U. S. EPA 1971.

TABLE 3.9-7
Estimated Maximum Construction Noise Levels at Nearby Receptors

Maximum Noise Source	Reference Hourly L_{eq} in dBA at 50 feet[a]	Actual Distance	Distance Adjustment[b]	Adjusted L_{eq} in dBA	Exterior Speech Interference Criterion in dBA	Exceeds Criterion	Reduction Due to Controls[c]	L_{eq} with Controls	Exceeds Criterion
Earthmoving Equipment	85	2,100	-34	51	70	No	Not required	NA	NA
Trucks	91	2,100	-34	57	70	No	Not required	NA	NA
Materials Handling	85	2,100	-34	51	70	No	Not required	NA	NA
Drilling/Stationary Equipment	80	2,100	-34	46	70 60 [d]	No No	Not required Not required	NA NA	NA NA
Impact Equipment	87	2,100	-34	53	70	No	Not required	NA	NA

Notes:

Noise generation is assumed to be at the proposed Phase 1 Bayside Well No. 1 and pipeline location; the closest residential receptors are assumed to be 2,100 feet to the east.

a Reference noise levels represent the highest noise level by equipment type (without controls) listed in Table 3.9-6 at 50 feet.

b The distance represents the minimum distance between the receptor and the closest facility construction location. Noise levels at more distant residences along referenced streets would be lower because noise levels decrease about 6 dBA for every doubling of distance from a point source (such as construction equipment).

C Noise control reductions represent the difference between the highest noise levels listed in Table 3.9-6 with controls versus without controls.

d Since drilling is proposed to occur 24 hours per day for extensometer construction, estimated noise levels under drilling/stationary equipment at the closest receptors are compared to the established speech and sleep interference criteria of 70 and 60 dBA, respectively. Assuming windows remain closed, interior noise levels would be 25 dBA lower, yielding interior thresholds of 45 to 50 dBA (L_{eq}) for speech interference and 35 dBA (L_{eq}) for sleep interference, well below the established significance criteria.

particularly of the percussive sort from pile driving, would have the greatest potential to disturb the rail population or other nesting birds. However, the nearest distance between the Phase 1 construction area and Bockman Canal is 750 feet. The U.S. Fish and Wildlife Service has observed an average radius of 700 feet for rail territories and has used this 700-foot radius in permitting other construction activities as the minimum setback distance required to avoid a "take" (i.e. no take would occur if construction activities are at least 700 feet away from rails). As the project work area is located beyond 700 feet, no significant noise exposure for this sensitive animal population would be expected. However, to verify that no clapper rail or black rail is located within 700 feet of the construction site, the mitigation below will be implemented to minimize any potential impacts.

Mitigation Measure 3.9-2. If construction work is to be conducted between mid-January and the end of June, conduct pre-construction nesting surveys to determine if species protected by the Migratory Bird Treaty Act are nesting in the vicinity of the work areas. If work is to occur during the clapper rail nesting or breeding period (approximately mid-January to mid-April), and if pre-construction surveys result in discovery of nesting activity, work shall be restricted to activities that do not have the potential to disturb breeding or nesting and that avoid generating percussive noise.

Impact Significance: Less than significant after mitigation

3.9.6 References – Noise

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U.S. Environmental Protection Agency (EPA). 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (Condensed Version).* (EPA/ONAC 550/9-74-004). Washington D.C.

_____. 1971. *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances.* Washington D.C.

3.10 Phase 1 Utilities

This section describes potential impacts and mitigation measures related to utilities for Phase 1. There is no discussion of public services impacts in this section because there are no public services impacts associated with Phase 1.

3.10.1 Approach to Analysis

This section addresses potential impacts to utilities from construction and operation of Phase 1. Utilities include water supply, wastewater, storm drainage, electricity, and natural gas. Implementation of Phase 1 would not have direct, long-term effects on demand for utilities. However, there could be short-term disruption to utilities during construction.

3.10.2 Setting

The subsections below describe the existing utilities setting for Phase 1.

3.10.2.1 Water Supply Services

EBMUD will supply water to the Phase 1 well for injection. EBMUD's water supply system is described in Section 1.0 of this DEIR.

Alameda County Water District (ACWD) supplies water to more than 300,000 people living in the cities of Fremont, Newark, and Union City. About 55 percent of ACWD source water is purchased from the State Water Project. Thirty percent of its water is purchased from the SFPUC. Local runoff from the Alameda Creek watershed accounts for about 15 percent of ACWD's total supply and recharges the aquifers of the Niles Cone Groundwater Basin. This runoff, together with water released from the South Bay Aqueduct at a location east of the town of Sunol, flows down Alameda Creek and into the Alameda Creek Flood Control Channel. Here, the water is captured behind three large, inflatable rubber dams. These dams divert water to the Quarry Lakes where it percolates to recharge the underlying groundwater basin. Sixteen wells are used to extract water from the groundwater basin. Together these wells are capable of producing up to 47.5 mgd of water. Recovered groundwater is blended with Hetch Hetchy water from the SFPUC water supply system before it is delivered to customers.

The City of Hayward operates its own water system and serves approximately 140,000 people. The city obtains nearly 100 percent of its water from SFPUC (average, 18 mgd). The City also operates groundwater wells as an emergency backup water supply.

3.10.2.2 Wastewater Services

Oro Loma Sanitary District (OLSD) is the agency responsible for wastewater collection, treatment, and disposal in the Phase 1 area. OLSD treats 15 mgd of sewage, including sewage flow from the Castro Valley Sanitary District. The OLSD plant has a design capacity of approximately 20 mgd. OLSD treats the wastewater to a secondary level through physical, biological, and chemical processes. The treated effluent is disposed of through a discharge pipe into the deep waters of the San Francisco Bay. OLSD expects to complete by the end of 2006 an upgrade of its wastewater treatment facility that will add a secondary sedimentation tank (see Section 6.0, Cumulative Impacts), thereby increasing its advanced secondary treatment capability to 20 mgd. Currently, there are three sewer trunk lines (one 66-inch-diameter and two 30-inch-diameter pipelines) along Grant Avenue leading to the OLSD wastewater treatment plant.

3.10.2.3 Storm Drainage Services

Alameda County Public Works Agency, acting in its capacity as the Flood Control and Water Conservation District, is responsible for major flood control operations in Alameda County. The County Public Works Agency Maintenance and Operations Department crews routinely monitor and clear silt basins, storm drains, and flood channels. The City of San Leandro Public Works Department maintains its own storm drain system within the city. There are two major drainage channels near the Phase 1 site: San Lorenzo Creek and Bockman Canal. Detailed descriptions of these drainage systems are included in Section 3.3, Surface Water Hydrology and Quality.

3.10.2.4 Gas and Electric Services

San Lorenzo and San Leandro, together with a majority of northern California cities and counties, receive electricity services from PG&E. PG&E and other power generators operate a combination of hydroelectric, fossil fuel-burning, and nuclear power plants, as well as other facilities that produce energy, including wind and geothermal plants. Electric power from these plants and supplemental power from other utilities is transmitted by means of high-voltage transmission lines to substations where the energy is converted to lower voltages that can be used by customers, businesses, and industry. Natural gas is delivered to the Phase 1 area by PG&E from resources in California, other western states, and Canada.

3.10.2.5 Solid Waste

Table 3.10-1 identifies operating landfills in Alameda and Contra Costa Counties and indicates the daily permitted capacity, the remaining capacity, and the estimated site life for these landfills.

TABLE 3.10-1
Estimated Remaining Capacity and Site Life for Alameda and Contra Costa County Landfills

Landfill	Remaining Capacity (Cubic Yards)	Remaining Capacity (Percent)	Max. Permitted Tons Per Day	Capacity Presumed Available?
Alameda County				
Altamont Landfill	15,843,000	26	11,150	Yes
Tri-Cities Recycling & Disposal	19,271,000	100	2,346	Yes
Vasco Road Sanitary Landfill	12,279,865	38	2,518	Yes
Contra Costa County				
Keller Canyon Landfill	68,279,670	91	3,500	Yes
Acme Landfill	175,000	65	1,500	Yes
West Contra Costa Landfill	1,300,000	5	2,500	No

Note:
Based on California Integrated Waste Management Board’s online landfill database (http://www.ciwmb.ca.gov/Profiles/Facility/Landfill/default.asp?VW=JSELECT&MTYPE=Landfill)

3.10.2.6 Existing Utilities

Table 3.10-2 lists providers of utilities in the Phase 1 area.

TABLE 3.10-2
Providers of Utilities in the Vicinity of Phase 1

Utility	San Lorenzo (unincorporated)
Wastewater	OLSD
Water	EBMUD
Storm Drainage	Alameda County Flood Control District
Gas and Electric	PG&E
Communications	SBC, Sprint,
Cable	Comcast

Sources: City of San Leandro website; County of Alameda Environmental Health Department (2000); EBMUD Utility Maps and Drawings; Oro Loma Sanitary District (2000, 2003, Utility Maps, and website); Pacific Bell Utility Maps; Pacific Gas & Electric Utility Maps; MCI Utility Maps; Qwest Utility Maps.

3.10.3 Significance Criteria

Consistent with CEQA Guidelines Appendix G, a project would normally have a significant impact on a utility if it would:

- Interferes with or substantially changes the demand for utility services, generate a need for new utilities, or require substantial alteration to utility systems.

3.10.4 Utilities Required for Phase 1

The subsections below describe the utilities required for Phase 1.

3.10.4.1 Water Supply

Treated water from the District's distribution system would be injected at the well during years of water surplus. The injection rate at the well would be at an annual average of 1.0 mgd, and injection would occur for up to several months at a time. Backflushing of the well would be required approximately every 6 weeks during injection-mode operation (approximately 200,000 gallons of backflush water for each cleaning). The backflush water would be pumped to the new wellhead treatment facility and dechlorinated for discharge to the stormwater or sewer system. A short pipeline would convey treated extracted groundwater to the existing 12-inch diameter distribution main in Grant Avenue, approximately 500 feet away. The Phase 1 well also uses a 2-inch-diameter domestic water service connection to supply the water lubrication system that would start prior to running of the well pumps.

3.10.4.2 Sanitary Sewer

Filter backwash water may be discharged to the sanitary sewer system. During the extraction operation, the backwash water from the filters would be stored in the backwash tank. Backwash water contains iron and manganese particles from the filters; this particulate matter would float on the surface or settle as sludge layers. The clear water from the top of the tank would be recycled to the clearwell for further treatment and reuse. The nonrecyclable portion of this water (about 4,500 gpd) would be discharged to the OLSD sewer system.

3.10.4.3 Electric and Gas

Because the existing water distribution system provides adequate pressures, additional pumping would not be needed at the well for the injection operations. Power consumption during injection would only be for low-wattage instrumentation and controls and for treatment processes at the wellhead and is estimated to be less than 150 kilowatt-hours per hour. During the extraction operation, the pumps would run continuously for up to several months. Based on a 200 Hp pump, the power consumption is estimated to be approximately 200 kilowatt-hours per hour. Natural gas consumption, if any, is expected to be very minimal.

3.10.4.4 Drainage

The proposed Phase 1 facilities are on a relatively level parcel and near Bockman Canal. The existing onsite drainage pattern would be maintained. As described above, backflush water may be discharged to the local storm drain system. Extracted groundwater from initial startup testing would also be discharged to the local storm drain system.

3.10.5 Effects Found to be Not Significant

The following impacts were considered in this section but were either found to fall below the established thresholds of significance or their significance is discussed in other sections of this DEIR. Therefore, there is no further discussion of these impacts in this section.

- Construction activities associated with Phase 1 would generate a very small amount of construction and demolition waste materials and excavation spoils. This level of waste could easily be accommodated with existing landfill capacities.
- Operation of Phase 1 would result in a minor increase in electricity demand. This demand could easily be accommodated by the existing electricity infrastructure.
- Operation of Phase 1 would result in discharges to the sanitary sewer system. These discharges would be in compliance with discharge requirements and could easily be accommodated by the existing sanitary sewer system collection and treatment capacity.
- Operation of Phase 1 would result in discharges to the storm drain system. These discharges would be in compliance with the existing NPDES permit for the ACFCWCD storm drain system and could be accommodated by the existing storm drain system capacity if discharge during significant rainfall periods is avoided.

3.10.6 References – Utilities

California Code of Regulations. 2004. Title 14. Chapter 3: "Guidelines for Implementing the California Environmental Quality Act."

California Integrated Waste Management Board. 2005. http://www.ciwmb.ca.gov/Profiles/Facility/Landfill/default.asp?VW=JSELECT&MTYPE=Landfill. January.

City of San Leandro. http://www.ci.san-leandro.ca.us/slcityservices.html.

East Bay Municipal Utility District. Utility Map Nos. 1518B432, 1518B430, 1518B428, 1521B434, 1521B432, 1521B430, 1521B428, 1524B434, 1524B432, 1524B430, and 1527B434.

__________. Utility Drawing Nos. W1373-1 through W1373-7.

MCI. Utility Map Nos. 18-L-1 and 19-L-2.

Oro Loma Sanitary District. 2000. Personal communication with Jim Bissel. December 19.

__________. 2003. Personal communication with Seyed Moeel. July 14.

__________. Sewer Maps Nos. 1524B430, 1521B430, 1527B430, 1530B430, 1527B434, and 1524B432.

__________. http://oroloma.org/service.htm.

Pacific Bell. Utility Map No. P5-19.

Pacific Gas and Electric Company. Electric Division. Utility Map No. Grid 80-000.

__________. Gas Division. Utility Map Nos. 12D-6, 12E-5, 12E-6, 12F-4, 12F-5, 12F-6, 12F-7, and 12F-8.

Qwest. Utility Map No. 19-L-2.

3.11 Phase 1 Cultural Resources

This section describes potential impacts and mitigation for cultural resources related to Phase 1 of the project.

3.11.1 Approach to Analysis

This section evaluates the potential impacts of Phase 1 construction on cultural resources. Cultural resources include prehistoric and historic archaeological sites and objects, historic buildings, known locations of important historic events, and sites of traditional or cultural importance to various groups. The Phase 1 project area was surveyed by a qualified archaeologist, and the results of that survey are cited in this section.

3.11.2 Setting

The subsections below describe the cultural resources setting for Phase 1 of the Proposed Project.

3.11.2.1 Ethnography

No known Native American villages or trails are situated within or near the Phase 1 site (Elsasser 1986; Levy 1978; as cited in Basin Research Associates 2000).

The Phase 1 site is within the former territory of the *Chochenyo* tribelet of the Costanoan Indians. The nearest known tribelet settlement of *lisyan* (exact location unknown) was south of San Lorenzo Creek (Levy 1978, as cited in Basin Research Associates 2000). Historic accounts of the distribution of the tribelets and villages in the 1770s–1790s suggest that Native Americans may have had a village site along San Lorenzo Creek as well as temporary camps in its vicinity.

3.11.2.2 Historic-Era Resources

Hispanic Period. No known Hispanic period dwelling sites, roads, or other features are situated in or near the Phase 1 site (La Croze 1858–1863; La Croze 1859; Hendry and Bowman 1940; Beck and Haase 1974; as cited in Basin Research Associates 2000).

Between 1769 and 1776, a number of Spanish expeditions passed through the San Francisco Bay region. Even though the routes of the early explorers cannot be determined with certainty, a number of explorers are known to have traveled through the vicinity of Phase 1. During the Mexican period, the Phase 1 area was situated within Rancho San Leandro on the north side of San Lorenzo Creek and Rancho San Lorenzo along the San Francisco Bay margin (Hendry and Bowman 1940; Beck and Haase 1974; as cited in Basin Research Associates 2000).

American Period. The Phase 1 area is situated in Eden Township. Major points of historical interest in the vicinity of the Phase 1 area include the towns of San Lorenzo and Thompson's Landing (later known as Roberts Landing), accessed via present-day Lewelling Boulevard[1] and later by Bockman Road. Farming and salt production were the major economic

[1] Lewelling Boulevard, the former link between San Lorenzo and Roberts Landing, has been realigned near the Bay margin (compare Thompson and West 1878 with USGS 1980; as cited in Basin Research Associates 2000).

activities in the study area during this time (Hart 1987; Sandoval 1988; as cited in Basin Research Associates 2000).

3.11.3 Cultural Resources in the Phase 1 Area

Phase 1 is located in an area designated as having "moderate" archaeological sensitivity.

3.11.3.1 Records Search

The authors of the Basin Research Associates 2000 report conducted a prehistoric and historic site records search through the California Historical Resources Information System, Northwest Information Center (CHRIS/NWIC), California State University (CSU) Sonoma, Rohnert Park (CHRIS/NWIC File No. 00-827). In addition, pertinent literature and archival records on file at Basin Research Associates and at other repositories (including the Bancroft Library, University of California, Berkeley) were consulted.[2]

The majority of the archaeological data available in the study area were compiled through cultural resource compliance programs undertaken for both public agencies and private entities. Most of the sites in the Phase 1 area and its immediate vicinity were recorded by Nelson during his systematic review of San Francisco Bay shellmounds between 1906 and 1908 (Moratto 1984; Nelson 1909, see also Nelson ca. 1910a; as cited in Basin Research Associates 2000). No other prehistoric or historic archaeological resources or local, state, or federal historic properties, landmarks, or other features of significance were identified in or in the vicinity of the Phase 1 site.

The State of California Native American Heritage Commission was contacted regarding potential sacred Native American sites. According to their records, no Native American cultural resources lie within the Phase 1 site.

3.11.4 Field Methods and Results

The presence or absence of significant archaeological resources was determined through a field inventory of the Phase 1 site (Guedon 2000, as cited in Basin Research Associates 2000). The field inventory consisted of a surface inspection of the Phase 1 facility locations. No buildings or other elements of the built environment that might require evaluation for the California Register of Historic Resources (CRHR) or the National Register of Historic Places (NRHP) were observed. No potentially significant cultural resources have been identified in or near any of the Phase 1 facility locations.

3.11.5 Significance Criteria

Consistent with CEQA Guidelines Appendix G, a project would normally have a significant impact on cultural resources if it would:

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[2] Specialized listings consulted include the *Historic Properties Directory* for Alameda County (CAL/OHP 2000a), the most recent updates of the *National Register of Historic Places*, and other evaluations of properties reviewed by the State of California Office of Historic Preservation. Other sources consulted include *Archaeological Determinations of Eligibility* (CAL/OHP 2000b), *California Inventory of Historic Resources* (CAL/OHP 1976), *California Historical Landmarks* (CAL/OHP 1990), *California Points of Historical Interest* (CAL/OHP 1992), *Five Views: An Ethnic Sites Survey for California* (CAL/OHP 1988), *Historic Civil Engineering Landmarks of San Francisco and Northern California* (American Society of Civil Engineers 1977), and local lists.

- Cause a substantial adverse change in the significance of a historical or archaeological resource,
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature, or
- Disturb any human remains, including those interred outside of formal cemeteries.

3.11.6 Effects Found to be Not Significant

The following impacts were considered but were found to be not significant or not applicable to Phase 1 of the project; therefore, there is no further discussion of these impacts.

- The potential for inadvertent discovery of buried cultural materials is very low. No prehistoric sites have been recorded in or adjacent to the Phase 1 site. The completion of an archaeological testing program prior to construction and archaeological monitoring during subsurface construction is not recommended.
- No significant historic-era archaeological resources would be affected by Phase 1. Intact historic-era sites are not present in the Phase 1 site as a result of past flooding, prior agricultural use of the Phase 1 site, and development that took place during the early part of the twentieth century. There are no historic buildings or structures within or adjacent to the Phase 1 site.

3.11.7 Impacts and Mitigation Measures

Phase 1 Potential Impact 3.11-1. Unanticipated discovery of subsurface archaeological deposits

There is little likelihood that cultural artifacts would be found during Phase 1 construction because of extensive prior ground-disturbing construction activities. However, construction activity always has the potential to reveal as-yet undiscovered materials by disturbing subsurface soils. Such disturbance could result in the loss of integrity of cultural deposits, loss of information, and alteration of a site setting.

Mitigation Measure 3.11-1. Require through project specifications that if cultural resources such as chipped or ground stone, historic debris, building foundations, or human bone are inadvertently discovered during construction activities, the construction contractor shall adhere to the following procedure:

- Stop work immediately within 100 feet of the discovery.
- Retain a qualified archaeologist to assess the significance of the find and develop appropriate actions for preservation or relocation of the artifacts in consultation with such experts as the State Historic Preservation Office and Native American tribal interests if appropriate.
- If human bone is discovered, notify the county coroner in compliance with state law, and the EBMUD Office of Regulatory Compliance.

Impact Significance: Less than significant after mitigation

3.11.8 References – Cultural Resources

Basin Research Associates. 2000. *Cultural Resources Assessment, East Bay Municipal Utility District Bayside Groundwater Project EIR, San Leandro and San Lorenzo, Alameda County, California*. November.

California Code of Regulations. 2004. Title 14. Chapter 3: “Guidelines for Implementing the California Environmental Quality Act.”

4.0 Phase 2 Environmental Setting, Impacts, and Mitigation Measures

Implementation of the project is proposed in two phases. Phase 1 is proposed for immediate implementation and would create average annual capacity of 1 mgd. Phase 2 is a potential future expansion with a capacity of between 2 and 10 mgd. EBMUD has made no commitment to implement Phase 2. EBMUD intends to use the information gathered from Phase 1 operations to help inform its future determinations on whether to proceed with Phase 2, and if so, to guide EBMUD in developing the Phase 2 design and operation features. If EBMUD decides to implement Phase 2, EBMUD would at that time complete a subsequent EIR. However, to the extent EBMUD can analyze the environmental setting, potential impacts, and mitigation measures for Phase 2 at this time, that analysis is included in this Section 4.0. Phase 1 of the project is addressed in Section 3.0.

4.1 Phase 2 Groundwater Hydrology and Quality

This section provides a qualitative evaluation of the potential to impact groundwater hydrology and quality for Phase 2.

4.1.1 Setting

The setting for Phase 2 is the same as that described for Phase 1 of the project and includes the NCGWB and SEBPB hydrologic units. These two groundwater basins are described in detail in Section 3.1.2.

4.1.2 Significance Criteria and Impact Analysis Methodology

The criteria for determining whether Phase 2 would have a significant impact to groundwater hydrology and quality is the same as that described for Phase 1, discussed in detail in Section 3.1.4.1. Because the design and operation of the Phase 2 facilities cannot be identified until Phase 1 start-up operations are complete, potential Phase 2 impacts are discussed qualitatively.

4.1.3 Impacts and Mitigation Measures

Phase 2 of the project includes potential future expansion of groundwater facilities up to 10 mgd capacity and would involve the installation of additional injection/extraction wells to provide the additional capacity. As included in the Phase 1 design, EBMUD would collect extensive groundwater level and water quality data during the first year of Phase 1 operations and would use this data to verify and refine the groundwater model, matching the modeled results to observed conditions. This would result in an updated model to (a) use in determining the feasibility of implementing Phase 2, and (b) to assist in designing Phase 2 to minimize the potential effects on water level changes, salt water intrusion, and subsidence. EBMUD would also collect extensive extensometer, water level, and ground surface elevation data to evaluate the potential occurrence of land subsidence in response to pumping.

Phase 2 Potential Impact 4.1-1: Adverse effect on native groundwater quality

Phase 2 operations would increase the Phase 1 rates of injection of water from the EBMUD distribution system into the Deep Aquifer of the SEBPB during non-drought years. Injection of increased quantities of treated potable water supplies to the SEBPB Deep Aquifer could result in long term changes in quality of the native groundwater.

EBMUD has conducted a demonstration test to determine the potential for adverse effects associated with injection of existing treated potable drinking water supplies and mixing with the native groundwater, and then designed Phase 1 to assure that there would be no impacts on water quality. Phase 2 would benefit from data collected during Phase 1 start up and operation to determine if groundwater quality could be affected during Phase 2 operations.

For example, Phase 1 water quality monitoring could be used to determine if trihalomethane (THM) formation in native groundwater could substantially degrade groundwater quality in Phase 2. However, based on results of demonstration testing to date and as discussed in Phase 1 Impact 3.1-1, it appears that THM formation would be well below primary drinking water standards. In summary, the potential impact on native groundwater quality cannot be determined until data is collected from Phase 1, and the location, operation, and capacity of the Phase 2 facilities is determined.

As further assurance of protection of the groundwater resources, Phase 2 would be required to comply with the Underground Injection Program and associated permit administered by the EPA. As described in Section 3.1.3, Regulatory Framework, this program provides safeguards so that injection wells do not endanger current and future underground sources of drinking water. Prior to issuing the necessary permit, the EPA would review the proposed Phase 2 facilities to ensure that the injected fluids are contained within the target aquifer system and in conformance with federal drinking water standards.

Impact Significance: Potentially significant until the degree of impact and feasibility of mitigation are determined in a subsequent EIR for Phase 2.

Phase 2 Potential Impact 4.1-2. Change in groundwater levels affecting ACWD operations in the NCGWB

With implementation of Phase 2, water levels in the NCGWB would be expected to decline in response to increased pumping in the SEBPB, and water levels would increase in response to increased rates of injection. Declines in water levels in the NCGWB could directly affect operations of ACWD's Below Hayward Fault production wells and reduce supplies for public and private use. ACWD operations also could be affected if increased water levels in response to injection reach ACWD's maximum working or operating limit or any maximum elevation imposed on ACWD. The degree of these effects would be dependent on Phase 2 well locations, the quantity/rate of water extracted or injected, and the pumping or injection strategy used. However, at this time, the location and capacities of Phase 2 facilities have not been determined. Therefore, expected specific water level changes and the extent of effects on ACWD operations as a result of pumping during Phase 2 cannot be identified at this time.

Prior to any determination to proceed with Phase 2, EBMUD would review the information gathered from Phase 1 and conduct groundwater modeling to predict the effects of increased groundwater extraction and injection on ACWD and the NCGWB. Similar to the Phase 1 analysis, the modeling would be conducted in close coordination with ACWD. This information would be used to (1) determine the feasibility of proceeding with Phase 2, (2) identify the best location for additional production wells, and (3) design extraction, injection, and mitigation strategies to maintain water levels in the Newark Aquifer of the NCGWB.

If EBMUD decides to proceed with Phase 2, it would adopt criteria and, if necessary, mitigation measures to ensure that groundwater would be maintained in the Newark Aquifer of the NCGWB within a scientifically reasonable range, consistent with the approach used to evaluate Phase 1 impacts. The Phase 2 criteria and mitigation measures could include providing potable water to the ACWD distribution system or make-up or recharge water to ACWD recharge facilities, changing pumping or injection strategies, operating at lower pumping rates, or stopping operations. Any such criteria and mitigation measures would be fully reviewed in the Phase 2 subsequent EIR EBMUD would complete in the future to proceed with Phase 2.

Impact Significance: Specific changes to NCGWB groundwater levels during Phase 2 implementation cannot be identified at this time. Based on presently available information, impacts related to NCGWB groundwater levels, if any, could be reduced to a less than significant level through Phase 2 design and operation requirements and mitigation measures, as discussed above. Until those design and operation requirements and mitigation measures are defined in a subsequent EIR for Phase 2, this impact would be considered potentially significant.

Phase 2 Potential Impact 4.1-3. Changes in groundwater level affecting other users of the SEBPB

Similar to Phase 1 Impact 3.1-3, increased Phase 2 operations would affect water levels in the SEBPB Deep Aquifer. Water levels would increase during injections and decrease during extractions. Declines in water levels could affect the operation of existing individual wells and increased water levels could cause existing wells to flow at the surface. The degree of these effects and specific wells that could be affected would be dependent on the location of Phase 2 wells, the quantity and rate of water extracted or injected, and the pumping or injection strategy used. However, in connection with Phase 2, EBMUD would inventory existing wells that could be affected; implement a well monitoring program; and implement, as necessary, mitigation measures to reduce the effects of water level changes in the SEBPB.

Impact Significance: Specific changes to SEBPB groundwater levels during Phase 2 implementation cannot be identified at this time. Based on presently available information, impacts related to SEBPB groundwater levels, if any, could be reduced to a less than significant level through Phase 2 design and operation requirements and the implementation of mitigation measures, as discussed above. Until those design and operation requirements and mitigation measures are defined in a subsequent EIR for Phase 2, this impact would be considered potentially significant.

Phase 2 Potential Impact 4.1-4. Changes in groundwater level affecting operations of the City of Hayward emergency supply wells

Lowering of groundwater levels in SEBPB and NCGWB in response to increased pumping up to 10 mgd during Phase 2 could result in a loss of capacity in one or more of the five City of Hayward emergency supply wells, four of which rely on all of the available drawdown under existing conditions to maintain full pumping capacity. Pressurization of the wells in response to injection in the Deep Aquifer could interfere with the City's ability to maintain their wells. The degree of these effects would be dependent on Phase 2 well locations, the quantity/rate of water extracted or injected, and the pumping or injection strategy used. Therefore, specific water level and well capacity changes expected as a result of pumping during Phase 2 cannot be identified at this time.

EBMUD would conduct groundwater modeling to predict the effects of the Phase 2 groundwater pumping and injection and use this information to site production wells and design pumping and injection strategies to maintain water levels within an acceptable range. Should water level changes under any scenario be beyond the acceptable limits, EBMUD would implement appropriate measures, including providing additional water to the City of Hayward, retrofitting their wells, or installing a new well to maintain the capacity of the existing well field as specified below. In addition, EBMUD would retrofit the existing Hayward emergency supply wells should injection of water during Phase 2 cause pressurization that interferes with ongoing operation of the wells.

Impact Significance: Specific effects on the Hayward Emergency Supply wells during Phase 2 implementation cannot be identified at this time. Based on presently available information, any Phase 2 impacts on the Hayward Emergency Supply wells could be reduced to a less than significant level through design and operation requirements and the implementation of mitigation measures, as discussed above. Until those design and operation requirements and mitigation measures are defined in a subsequent EIR for Phase 2, this impact would be considered potentially significant.

Phase 2 Potential Impact 4.1-5. Saltwater intrusion in the SEBPB and NCGWB and/or movement of pre-existing plumes of brackish water in the NCGWB

Increased groundwater pumping of up to 10 mgd during Phase 2 could induce saltwater intrusion to the Newark Aquifer equivalent in the SEBPB by reversing groundwater gradients or to the Deep Aquifer by increasing the vertical groundwater gradient and inducing downward migration of Bay water. In the NCGWB, Phase 2 pumping could lower water levels in the Newark Aquifer that would reduce flushing of the aquifer or cause new seawater intrusion. Lowering of water levels in the Deep Aquifer in response to pumping could also potentially increase chloride transported from the Newark Aquifer to the underlying Centerville and Fremont Aquifers, and subsequently to the Deep Aquifer. Phase 2 pumping could induce lateral movement of brackish water plumes, especially in the deep aquifer. The degree of these effects would be dependent on Phase 2 well locations, the quantity/rate of water extracted or injected, and the pumping or injection strategy used. Therefore, specific water level changes and the resulting impacts of seawater intrusion and chloride movement expected as a result of pumping during Phase 2 cannot be identified at this time.

In the SEBPB, water quality impacts related to saltwater intrusion would be considered significant if pumping for Phase 2 resulted in an increase in the amount of salts carried into the Newark Aquifer equivalent or vertically from the Bay to the Deep Aquifer. In the NCGWB, these impacts would be considered significant if pumping during Phase 2 resulted in seawater intrusion; interfered with ACWD's program to control and/or reverse the effects of previous saltwater intrusion by decreasing the amount of salt flushed to the Bay in the Newark Aquifer; increased the downward transport of salts from the Newark Aquifer to the Centerville and Fremont Aquifer and ultimately to the Deep Aquifer; or enhanced the lateral migration of an existing chloride plume.

EBMUD would monitor water level and water quality responses in the SEBPB and NCGWB during actual Phase 2 operations; use the regional model to interpret the effects of Phase 2 operations on the SEBPB and NCGWB; verify the regional model using observed groundwater data; and implement mitigation measures to maintain NCGWB groundwater levels within acceptable limits, as described under Phase 2 Impact 4.1-2. EBMUD would implement mitigation measures such as altering pumping operations, decreasing pumping rates, expanding facilities to control saltwater intrusion, or providing recharge of water to the Newark Aquifer. The evaluation would consider the cumulative migration of the salt water plumes under both extraction and injection scenarios. With mitigation, water quality impacts related to salt water intrusion in the SEBPB and NCGWB could be less than significant. If and when EBMUD proceeds with Phase 2, a subsequent EIR evaluating of the extent of the impact and feasibility of mitigation measures would be prepared.

Impact Significance: Whether saltwater intrusion would occur in the SEBPB and NCGWB during Phase 2 implementation cannot be identified at this time. Based on currently available information, the potential impacts of saltwater intrusion could be reduced to a less than significant level through design and operation requirements and the implementation of mitigation measures, as discussed above. Until those design and operation requirements and mitigation measures are defined in a subsequent EIR for Phase 2, this impact would be considered potentially significant.

Phase 2 Potential Impact 4.1-6. Land subsidence resulting from exceedence of historic low water levels during Phase 2

Drawdown as a result of increased groundwater pumping in the Deep Aquifer during Phase 2 could induce land subsidence in the SEBPB. The extent and degree of subsidence would depend on the extent of cumulative groundwater pumping from Phases 1 and 2 and the resulting change in the internal water pressure in the sediment pore spaces in the land overlying the Deep Aquifer. Potential long term effects of land subsidence in the SEBPB could include increased flooding, greater backflushing of surface waters from the Bay, increased saltwater intrusion in shallow aquifers, increased coastal flooding, submerging of existing marshlands, and changes in gradients within canals and other gravity flow features.

Although specific extraction well locations have not been identified for Phase 2, inelastic (or permanent) subsidence would not be expected if groundwater levels are maintained above historic lows during Phase 2. Depending on well locations, the acceptable level of subsidence may vary due to susceptibility to flooding (or lack thereof). EBMUD would continue to implement a subsidence monitoring program, described above under Phase 1, and augment this program as determined necessary by the results of Phase 1. However, since the results of the Phase 1 subsidence monitoring program are unknown, the potential for inelastic subsidence during Phase 2 would be considered potentially significant. If necessary, shifting pumping between wells, pumping at reduced capacity if inelastic subsidence approached unacceptable limits, or stopping pumping altogether, could reduce any land subsidence impacts to a less than significant level. However, if and when EBMUD proceeds with Phase 2, a subsequent EIR evaluating the extent of impact and feasibility of mitigation measures would be prepared.

Impact Significance: Whether land subsidence from exceedence of historic low water levels would occur during Phase 2 implementation cannot be identified at this time. Based on currently available information, the potential impacts could be reduced to a less than significant level through design and operation requirements and the implementation of mitigation measures, as discussed above. Until those design and operation requirements and mitigation measures are defined in a subsequent EIR for Phase 2, this impact would be considered potentially significant.

4.1.4 References – Groundwater Hydrology and Quality

No references were used in the preparation of this section. See references for Section 3.1.

4.2 Phase 2 Water Quality, Treatment, and Distribution

This section provides a qualitative evaluation of the potential impacts related to water quality, treatment, and distribution for Phase 2 of the project. If EBMUD proceeds with Phase 2, a subsequent EIR would be prepared to evaluate potential impacts associated with the specific locations for Phase 2 facilities.

4.2.1 Setting

The setting for water quality, treatment, and distribution for Phase 2 of the project is expected to be similar to that described in Section 3.2 for Phase 1 with the exception that regulations anticipated during Phase 1 may have been promulgated by the time that Phase 2 is implemented. Those anticipated regulations include the Groundwater Rule, the Radon Regulation, the Stage 2 Disinfectants and Disinfection By-Products Rule, the Sulfate Regulation, and the updated drinking water candidate contaminant list, each of which is described in Section 3.2.2.5.

4.2.2 Effects Found to be Not Significant

The following impacts were considered but were found to be not significant or not applicable to Phase 2 of the project; therefore, there is no further discussion of these impacts.

Health-related Effects. Health-related effects from the introduction of a new water source were found not to be significant for Phase 2.

Sampling of native and recovered injection water showed that the concentration of only a few chemical constituents might be increased as a result of project operation but would still remain well below its MCL, as shown in Table 3.2-1.

The concentrations of organic chemicals in extracted groundwater were found to be even lower than in EBMUD's current delivered water. The concentration of disinfectant by-products (DBPs) in delivered recovered groundwater water also is also expected to be lower than in the water currently delivered to customers within the vicinity of the project. This expectation has been demonstrated in the test results, which show a decline in chloroform concentrations of recovered water during extraction. The chloroform concentrations decline because injected water, as it is extracted, mixes with native groundwater, which does not contain DBPs.

Pathogens and microorganisms associated with fecal contamination have not been detected in groundwater extracted from the Deep Aquifer. This result was expected because the aquifer is well isolated from potential contamination, and the soil acts as a filter to prevent underground movement of these organisms.

Overall, the quality of water delivered to customers would cause no adverse health effects, given that no primary MCLs would be exceeded. If any contamination arises in groundwater, it would be detected by regular sampling of the monitoring wells, extracted groundwater, treated project water, and water within the distribution system. In the unlikely event that contamination occurs, project operation would be immediately suspended, the source of the problem identified, and corrective measures taken.

Aesthetic effects on the quality of water delivered to District customers

Groundwater delivered to customers will meet all secondary (aesthetic) standards.

Higher levels of dissolved solids, hardness, and alkalinity in project water, which could affect industrial or commercial businesses served by the District. EBMUD water delivered to customers would meet all primary and aesthetic water quality standards. However, substantial changes in certain water constituent levels have the potential to affect cooling operations, boiler feed, and industrial processes. To address such changes, the District will utilize its notification system to alert sensitive businesses of these changes to provide lead time for process adjustments.

4.2.3 Impacts and Mitigation Measures

Significance criteria used to evaluate potential impacts to water quality, treatment and distribution from Phase 2 of the project are the same as those used for Phase 1 as described in Section 3.2.4. In addition, the impacts identified for Phase 1, as described in Section 3.2.5, and the effects found to be not significant, as described in Section 3.2.4.1, are anticipated to be the same for Phase 2.

Impact conclusions cannot be drawn at this time regarding the constituents addressed in the anticipated regulations described above. If and when the District proceeds with the development of Phase 2, an evaluation of the current water quality standards at that time will be required to determine potential impacts and, if necessary, appropriate mitigation measures.

Phase 2 Potential Impact 4.2-1. Potential drawing of contamination into the water supply through pumping

Section 3.7.2.1 of this DEIR describes the investigative methods used to detect the presence of chemical compounds such as gasoline leaked from underground fuel tanks in the aquifer potentially affected by Phase 2 operation. Figures 3.7-2 through 3.7-6 depict the locations of regional groundwater contaminant plumes identified by the State Water Resources Control Board. It should be noted that the nearest regional plume is more than 2 miles away from the expected project site. Moreover, all of these plumes are within the shallow *Newark Aquifer equivalent* zone (30 to 130 feet bgs) described in Section 3.1.2.1 of this DEIR. The deepest known contamination in the SEBPB is located approximately 7 miles north of the Phase 1 site at a depth of approximately 300 feet bgs.

As previously described, project operation will draw from the *Deep Aquifer* zone, which is approximately 500-650 feet bgs. Because of the naturally slow movement of groundwater (only a few feet or a fraction of a foot in a year), contaminants to not mix or spread quickly. Moreover, because of variations in aquifer material, hydraulic gradient, thickness, porosity, and hydraulic conductivity, the flow paths of contaminants is not a straight line; thus, their actually travel time could be longer than those approximated times which assume homogeneous aquifer properties.

Water age is a reliable indicator of the degree of separation between the shallower and deeper aquifer layers. The USGS determined that the 9,000-year age of the deep aquifer supply in the SEBPB is significantly older than that of the more recent shallow zone waters. These differences indicate that the zones are firmly separated, and that there has been no measurable interaction between those aquifers during historic stress periods when deep zone water levels reached historic lows.

Bayside Well No. 1 will be screened in the deep aquifer only. Wells in Phase 2 will also only be screened in the deep aquifer. Contaminants from the shallower aquifer could migrate to the deeper aquifer through vertical conduits such as old wells that are screened in more than one aquifer. Upon reaching the deeper aquifer, the contaminants could migrate laterally toward the project location if the direction and gradient of flow are sufficient to cause such movement. However, injection may cause any such flow to reverse.

Impact Significance. Whether operation of Phase 2 could result in contamination of the deep aquifer from existing contaminant plumes in the shallow *Newark Aquifer equivalent* zone cannot be determined at this time. Based on currently available information, the potential impacts, if any, could be reduced to a less than significant level through design and operation requirements and the continuation of implementation of Mitigation Measures 3.2-1a, b and c. Specific impacts and mitigation measures cannot be determined until the District determines whether or not to proceed with Phase 2 and, if so, determines Phase 2 locations. The impact is considered potentially significant until facility locations and feasibility of mitigation are determined in a subsequent EIR for Phase 2.

Phase 2 Potential Impact 4.2-2. Pressure effects could reduce level of service in the water system

Because the location and capacity of Phase 2 facilities are not known, it is not possible to model and evaluate the impacts to level of service that might be caused by Phase 2. Phase 2 facilities would be designed and located to minimize level of service impacts.

Impact Significance: Specific impacts and mitigations cannot be determined until the District determines whether or not to proceed with Phase 2 and, if so, determines Phase 2 facility locations. The impact is considered potentially significant until facility locations and feasibility of mitigation are determined in a subsequent EIR for Phase 2.

4.2.4 References – Water Quality, Treatment, and Distribution

No references were used in the preparation of this section. See references for Section 3.2.

4.3 Phase 2 Surface Water Hydrology and Quality

This section evaluates qualitatively the potential impacts on surface-water hydrology and water quality of Phase 2 of the project. If EBMUD proceeds with Phase 2, a subsequent EIR will be prepared to evaluate potential impacts associated with the specific locations for Phase 2 facilities.

4.3.1 Setting

The setting for surface-water hydrology and quality for Phase 2 is the same as the setting for Phase 1 (see Section 3.3), except as noted below. Additional surface-water features not included in the Phase 1 area, such as creeks and man-made drainage channels, are located throughout the area in which Phase 2 facilities might be located. Storm drainage and flooding potential would depend on the locations selected for Phase 2 facilities.

4.3.2 Impacts and Mitigation Measures

The significance criteria described in Section 3.3 were used to qualitatively evaluate potential impacts to surface-water hydrology and quality from implementation of Phase 2 of the project. Phase 2 would not include housing that would be placed in a 100-year flood hazard zone. Potential impacts from placing other structures within a 100-year flood hazard area would need to be evaluated when Phase 2 facility locations are selected.

Phase 2 Potential Impact 4.3-1. Construction-related stormwater erosion, sedimentation, and transport of fuels, oils, or grease to surface waters

Construction of the Phase 2 facilities would include soil disturbance associated with drilling new wells, building treatment facilities, and installing pipelines. Soil stockpiles and excavation and grading activities during construction could expose soil to stormwater runoff and could cause erosion and entrainment of sediment in the runoff. If not managed properly, the runoff could increase sedimentation in storm sewers or drainages. Wind erosion could also deposit sediment in culverts or drainages.

In addition, construction equipment, drill rigs, and support equipment could leak hydraulic oils and fuel that could contaminate soil and subsequently contaminate stormwater if rainwater comes into contact with the contaminated soil.

Mitigation Measure 4.3-1. Implement BMPs designed to reduce contact between exposed soil and rainfall; minimize erosion of exposed soil; and minimize the contact of construction materials, equipment, and maintenance supplies (e.g., fuels, lubricants, paints, solvents, and adhesives) with stormwater. If the area of disturbance is greater than one acre, Phase 2 activities will need to comply with the Construction General Permit, including implementation of a construction Stormwater Pollution Prevention Plan (SWPPP) that covers all areas to be disturbed by construction activities.

Impact Significance: Less than significant after mitigation

Phase 2 Potential Impact 4.3-2. Discharge of sediments and other pollutants to surface water from dewatering of excavations

Groundwater levels are high in some portions of the Phase 2 area, and dewatering may be required for construction of some Phase 2 facilities. As discussed in Section 3.7, Hazards, the District has in place a Trench Spoils Field Management Practice Program. This Program defines a procedure, described in Impact 3.7-1, for assessing the quality of water that would be produced during dewatering activities and identifying the appropriate disposal method for that water. In accordance with this procedure, groundwater from dewatering can be discharged directly to the storm sewer system if trenching activities are conducted more than 250 feet from a site with known groundwater contamination. For activities conducted within 250 feet of a site with known groundwater contamination, the groundwater may be discharged to the storm sewer if the chemical concentrations are less than MCLs for drinking water for the contaminants of concern, or to the sanitary sewer if the chemical concentrations are within acceptable limits. The groundwater may require containerization and offsite disposal if chemical concentrations exceed acceptable limits for discharge to the sanitary sewer. In each case, appropriate sediment control measures, such as use of a settling tank prior to discharge, would be implemented.

Mitigation Measures 4.3-2. Implement Mitigation Measures 3.7-1b (compliance with the District's Trench Spoils Field Management Practice Program), 3.7-1c (preparation of a disposal plan specifying the disposal method for soil), and 3.7-1d (preparation of a detailed discharged water control and disposal plan), as specified in Section 3.7, Hazards.

Impact Significance: Less than significant after mitigation

Phase 2 Potential Impact 4.3-3. Adverse affect on water quality from discharges to the San Francisco Bay

Although the specific locations for Phase 2 wells are not known, it is anticipated that well backflush would be discharged into a storm drain that is permitted under the existing ACFCWCD NPDES permit. Once specific locations are identified, a subsequent EIR will be prepared to evaluate potential impacts associated with discharge.

Mitigation Measure 4.3-3. Comply with conditions in the existing ACFCWCD NPDES permit for stormwater discharges to San Francisco Bay.

Impact Significance: The impact is considered potentially significant until facility locations and feasibility of mitigation are determined in a subsequent EIR for Phase 2.

Phase 2 Potential Impact 4.3-4. Increased stormwater runoff from new impervious surfaces

Construction of Phase 2 facilities would create new impervious surfaces, which could result in a higher volume, velocity, and pollutant load in runoff relative to current conditions. A higher runoff volume and velocity could increase erosion into receiving waters. Stormwater runoff may be subject to the requirements of the Alameda Countywide NPDES Municipal Stormwater Permit and the *Draft Stormwater Management Plan* prepared by the Alameda Countywide Cleanwater Program (ACCWP 2001). Accordingly, discharges from Phase 2 facilities should not cause or contribute to an exceedance of water-quality standards contained in the Basin Plan; to ensure that water-quality standards are not exceeded, the

District would be required to implement control measures and BMPs to reduce pollutants in stormwater runoff from the project to the maximum extent practicable.

Mitigation Measure 4.3-4. Develop and implement stormwater control measures consistent with the requirements of the Alameda Countywide NPDES Municipal Stormwater Permit, and the *Draft Stormwater Management Plan* (ACCWP 2001), for the control of stormwater runoff. Stormwater control provisions will be included in the site design to reduce the flow, volume, and pollutant load in site runoff to the maximum extent practicable in accordance with the requirements of the permit. The District will coordinate with Alameda County in the development and implementation of appropriate stormwater control measures.

Impact Significance: Less than significant after mitigation

4.3.3 References – Surface Water Hydrology and Quality

Alameda Countywide Clean Water Program (ACCWP). 2001. *Draft Stormwater Management Plan, July 2001 – June 2008*. July 31.

4.4 Phase 2 Biological Resources

This section provides a qualitative evaluation of the potential impacts to biological resources for Phase 2 of the project. If EBMUD proceeds with Phase 2, a subsequent EIR would be prepared to evaluate potential impacts associated with the specific locations for Phase 2 facilities.

4.4.1 Setting

Biological resources in the vicinity of Phase 1 facilities, historical impacts to biological resources in the region, and the relevant regulatory framework are described in Section 3.4. Although the proposed sites for Phase 2 facilities have not been determined, it is possible that some of these sites may be adjacent to, or near, biologically sensitive areas. Therefore, regional biological resources potentially affected by Phase 2 are described in a general manner.

The vegetation communities that were historically supported in various parts of the area where Phase 2 facilities may be located included oak woodland, native perennial grassland, coastal prairie, coastal scrub, riparian forest, riparian woodland, riparian grassland, freshwater marsh, and tidal marsh. Because of historical and current disturbances, many remaining open areas are dominated by non-native plants, including non-native annual grasses and weedy species. Numerous creeks and flood channels provide freshwater aquatic habitat within the area that could include Phase 2 facilities. Tidal wetlands exist at various locations along the San Francisco Bay. Numerous special-status plant and wildlife species are located throughout the area where Phase 2 facilities might be located. For example, salt marsh harvest mouse and California clapper rail (state and federal endangered species) may occur in salt marsh habitat along the Bay. Information on some special-status species is provided in Section 3.4.2.

4.4.2 Impacts and Mitigation Measures

Significance criteria used to evaluate potential impacts to biological resources from Phase 2 are the same as those used for Phase 1 of the project in Section 3.4. Depending on the locations selected for Phase 2 facilities, potentially significant impacts to biological resources not discussed below could occur, such as impacts to special-status plant and wildlife species or waters of the United States.

Phase 2 Potential Impact 4.4-1. Transport of sediment into sensitive areas

If Phase 2 facilities are located near surface waters or sensitive habitat areas, soil disturbance from construction activities could increase the transport of sediment into sensitive aquatic and wildlife habitat areas during storm runoff events. This increase in sediment could incrementally impact aquatic and wildlife habitat.

Potential mitigations include BMPs designed to reduce contact between exposed soil and rainfall and minimize erosion of exposed soil with stormwater. BMPs may include, but are not limited to, the use of silt fencing, straw wattles, and silt and sediment traps. If the area of disturbance is greater than 1 acre, Phase 2 would need to comply with the Construction

General Permit, including preparation and implementation of a construction Stormwater Pollution Prevention Plan that covers all areas to be disturbed by construction activities.

Impact Significance: Potentially significant until facility locations and feasibility of mitigation are determined in a subsequent EIR for Phase 2.

Phase 2 Potential Impact 4.4-2. Increased turbidity, changed water temperature, reduced levels of salinity, or introduced chlorine from discharge of water into surface waters

During operation of Phase 2 facilities, backflush water may be discharged to surface waters through the storm drain system, resulting in disturbance of desirable native wetland or marsh vegetation or change in tidal flat elevation through deposition of sediments (Evens 2001).

Reduced levels of salinity resulting from freshwater discharge can promote the invasion of exotic cordgrass that displaces native cordgrass, to the detriment of preferred habitat for rails. The exotic *Spartina* affords lesser vegetative cover for rails than do native grasses, increasing the birds' exposure to predation. Significant differences in temperature between discharge and Bay marsh waters can also retard beneficial vegetation growth. Because the discharges will be episodic, they are not anticipated to reduce salinity except on a short-term basis, which would not be expected to cause noticeable changes in vegetation.

Potential mitigations include conducting active treatment and temporary onsite holding in accordance with permitting restrictions, dechlorinating all water prior to discharge in accordance with applicable regulations, and/or using instrumentation to monitor the salinity, temperature, and chlorine content prior to discharge to surface waters.

Impact Significance: Potentially significant until facility locations and feasibility of mitigation would be determined in a subsequent EIR for Phase 2.

Phase 2 Potential Impact 4.4-3. Accumulation of debris that subsidizes predatory animals to the detriment of natural habitats near the project area

If Phase 2 facilities are located near sensitive areas that provide habitat for nesting birds, predation impacts could occur. One of the primary causes for endangerment of the black rail and clapper rail is predation of their nests by urban mammals. To reduce this risk to the bird population of the marshland habitat, mammal subsidies should be controlled by eliminating sources of scavenge and by eliminating predator nesting opportunities and facilitated access afforded by riprap, rubble piles and boards across ditches (Evens 2001).

Potential mitigation includes:

- Disposal of refuse and placement of stored items in bins, containers or other secured facilities to prevent their use as shelter by mammalian predators;
- Locking trash barrels for discarded food items and containers and prompt removal of litter;
- Removal of planks and passages over water, and other means of temporary access nightly to prevent mammalian predation of ground nesting birds; and

- Removal of surplus materials, scrap material, debris, and waste from the job site upon completion of construction.

Impact Significance: Potentially significant until facility locations and feasibility of mitigation are determined in a subsequent EIR for Phase 2.

4.4.3 References – Biological Resources

Evens, J., Wildlife biologist and principal with Avocet Research Associates. 2001. Memorandum to East Bay Municipal Utility District regarding Bayside Groundwater Project/wildlife impacts dated September 25.

4.5 Phase 2 Geology, Soils, and Seismicity

This section qualitatively evaluates the potential impacts related to geology, soils, and seismicity for Phase 2 of the project. If EBMUD proceeds with Phase 2, a subsequent EIR will be prepared to evaluate potential impacts associated with the specific locations for Phase 2 facilities.

4.5.1 Setting

The geology and seismicity setting and regulatory framework for Phase 2 are the same as described for Phase 1 in Section 3.5.2. Site-specific geotechnical investigations will be completed, and localized topography, soil conditions, liquefaction potential, ground shaking potential, and applicability of seismic-related regulations will be determined when locations for Phase 2 facilities are identified.

4.5.2 Impacts and Mitigation Measures

Significance criteria used to evaluate potentially significant geologic impacts from Phase 2 of the project are the same as those used for Phase 1 in Section 3.5.3.

Groundwater modeling has not yet been conducted for Phase 2 of the project because specific well locations have not been identified. Therefore no impact conclusions can be drawn regarding the potential for water level rise to increase liquefaction potential. Additional site-specific impacts that would need to be evaluated when Phase 2 facility locations are identified include potential fault rupture, earthquake-induced landslides, significant erosion, and inundation by tsunami.

Phase 2 Potential Impact 4.5-1: Earthquake damage to Phase 2 facilities

Phase 2 facilities could experience severe ground shaking from a large earthquake on a nearby active fault during the design lifetime of the facilities. The USGS predicts that the probability of an earthquake greater than or equal to Magnitude 6.7 occurring on one of the three nearby faults ranges from 11 percent to 27 percent, and the cumulative probability of an earthquake occurring on one of the faults would be greater.

Ground shaking is the most widespread effect of earthquakes and poses a greater seismic threat than local ground rupture. Strong ground shaking could cause secondary effects, including spreading, liquefaction, or collapse, which could, in turn, cause damage to the project facilities. As part of standard design procedures, facilities would be designed to withstand strong ground shaking from an earthquake. Implementation of the geotechnical investigation and construction in accordance with appropriate seismic design criteria in the UBC would reduce the potential ground shaking impact to less than significant. Compliance with UBC requirements for expansive soil would reduce the related potential impacts to less than significant.

EBMUD maintains an earthquake preparedness and emergency response program intended to inform and train EBMUD personnel in proper procedures to inspect, respond, and repair their facilities following an earthquake. As part of the program, EBMUD conducts practice drills of emergency response procedures annually, using simulated earthquake scenarios.

Mitigation Measure 4.5-1a. Identify the appropriate UBC design criteria for the proposed facilities on the basis of the subsurface conditions at the site and ensure that the UBC design criteria are incorporated into the final design of the project.

Mitigation Measure 4.5-1b. Update the EBMUD earthquake preparedness and emergency response program to include Phase 2 facilities.

Impact Significance: Potentially significant until feasibility/effectiveness of mitigation is determined in a subsequent EIR for Phase 2.

4.5.3 References – Geology, Soils, and Seismicity

No references were used in preparation of this section. See references for Section 3.5.

4.6 Phase 2 Air Quality

This section qualitatively evaluates potential impacts on air quality from Phase 2 of the project. If EBMUD proceeds with Phase 2, a subsequent EIR will be prepared to evaluate potential impacts associated with the specific locations for Phase 2 facilities.

4.6.1 Setting

The information described in Section 3.6.2, the Air Quality Setting for Phase 1 also applies to Phase 2. Although Phase 2 treatment facilities have not yet been determined, it is likely that the treatment will either be provided by a central treatment facility (if wells are clustered together) or a small treatment facility at each wellhead (if wells are distributed over a large geographic area). Depending on the treatment selected, issues such as radon or chloroform would be addressed as applicable. Further details would be presented as appropriate in a subsequent EIR if the District proposes to implement Phase 2 facilities that include a central treatment facility.

4.6.2 Impacts and Mitigation Measures

Significance criteria used to evaluate potentially significant air quality impacts from Phase 2 of the project are the same as those used for Phase 1 in Section 3.6.3. Construction of the Phase 2 facilities would affect ambient air quality. Construction impacts are generally localized and would temporarily affect sensitive receptors but only in the immediate vicinity of Phase 2 facilities.

Operational impacts would depend on whether a central treatment facility or multiple small treatment facilities distributed over a large geographic area (at wellheads) is proposed for Phase 2. Operational impacts are also dependent on the proposed treatment processes and the location of facilities relative to surrounding sensitive receptors. Therefore no impact conclusions can be drawn at this time regarding potential air quality impacts associated with operations of Phase 2 facilities.

4.6.2.1 Construction Impacts

Phase 2 Potential Impact 4.6-1. Particulate and exhaust emissions generated from construction of proposed facilities

As stated in Section 3.6.5.1, BAAQMD considers project-related particulate emissions (PM_{10}) to be mitigated to less than significant levels with implementation of applicable dust-control measures. These measures are grouped into three categories:

- Basic Control Measures apply to all construction sites,
- Enhanced Control Measures apply to sites larger than four acres (total area of disturbance at any given time), and
- Optional Control Measures apply to larger sites near sensitive receptors.

The construction disturbance area for Phase 2 facilities in terms of dust (PM_{10}) generation is currently unknown but would be subject to implementation of BAAQMD Control Measures stated in Mitigation Measure 4.6-1.

Construction equipment emits CO and ozone precursors during combustion of diesel fuel. BAAQMD's determination is, however, that these emissions have been included in the emissions inventory that was the basis for the 1997 Clean Air Plan (BAAQMD 1997) and any subsequent air quality plans. Because BAAQMD does not consider construction-related exhaust emissions to be "new" emissions, these emissions would not impede attainment or maintenance of ozone or CO standards in the air basin (BAAQMD 1999). Therefore, emissions associated with operation of construction equipment during Phase 2 construction would be less than significant.

Mitigation Measure 4.6-1. Construction activities must comply with applicable control measures for dust emissions, as outlined in the *BAAQMD CEQA Guidelines*. These include:

Basic Control Measures (apply to all construction sites)

- Water all active construction areas at least twice daily.
- Cover all trucks hauling soil, sand, and other loose debris *or* require all truckloads to maintain at least two feet of freeboard.
- Pave, apply water three times daily, or apply nontoxic soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.
- Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at construction sites.
- Sweep streets daily (with water sweepers), if visible soil material is carried onto adjacent public streets.

Enhanced Control Measures (apply to sites larger than 4 acres)

- All Basic Control Measures listed above.
- Hydroseed or apply (nontoxic) soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more).
- Enclose, cover, water twice daily or apply (nontoxic) soil binders to exposed stockpiles (dirt, sand, etc.).
- Limit traffic speeds on unpaved roads to 15 mph.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways.
- Replant vegetation in disturbed areas as quickly as possible.

Optional Control Measure (apply to larger sites near sensitive receptors or for any other reason where additional emissions reductions are warranted)

- Install wheel washers for all exiting trucks, or wash off the tires or tracks of all trucks and equipment leaving the site.
- Install wind breaks, or plant trees/vegetative wind breaks at windward side(s) of construction areas.

- Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph.
- Limit the area subject to excavation, grading, and other construction activity at any one time.

Impact significance: Potentially significant until the feasibility and effectiveness of mitigation is determined in a subsequent EIR for Phase 2

4.6.3 References – Air Quality

Bay Area Air Quality Management District (BAAQMD). 2001. *Toxic Air Contaminant Control Program, Annual Report, 2000, Volume I.* December. http://www.baaqmd.gov/pmt/toxics/tca_annualrep.asp.

_____. 1999. *BAAQMD CEQA Guidelines, Assessing the Air Quality Impacts of Projects and Plans.* December.

_____. 1997. Bay Area 1997 Clean Air Plan. December.

4.7 Phase 2 Hazards

This section evaluates qualitatively the potential impacts related to hazards for Phase 2 of the project. If EBMUD proceeds with Phase 2, a subsequent EIR will be prepared to evaluate potential impacts associated with the specific locations for Phase 2 facilities.

4.7.1 Setting

For information about setting, please see Section 3.7.2, which describes the hazards setting for Phase 1; the same information applies to Phase 2. However, because the type, extent, and location of Phase 2 facilities have not yet been defined, conclusions regarding Phase 2 impacts on historic and current land uses, permitted hazardous materials uses, and environmental cases in the vicinity of Phase 2 facilities, which may include venues in San Lorenzo, San Leandro, and/or Oakland, cannot be reached at this time.

4.7.2 Effects Not Expected to Be Significant

Although the location of Phase 2 facilities have not yet been determined, it is likely that impacts related to interference with an adopted emergency response plan or emergency evacuation plan, use of hazardous materials within one-quarter mile of a school, and safety issues associated with nearby public and private airfields would not be significant for the following reasons:

- **Emergency Response Plan.** Phase 2 wells and associated facilities would likely be located so that construction or operation would not cause road closures or otherwise interfere with an adopted emergency response plan or emergency evacuation plan.
- **One-quarter Mile of a School.** Even if a Phase 2 well and associated treatment facilities were located within one-quarter mile of a school, any impacts related to the use of hazardous materials are expected to be less than significant because of compliance with CUPA regulations requiring a hazardous materials business plan and CalARP requirements requiring an RMPP (if ammonia storage volumes were to exceed the threshold planning quantity of 500 pounds at one location).
- **Airport Safety Zone.** Proposed Phase 2 wells and facilities would likely not be located within an airport safety zone[1] and would not be expected to interfere with flight operations or be at risk of damage from flight operations in the event of an accident.

For these reasons, Phase 2 impacts related to interference with an adopted emergency response plan or emergency evacuation plan, use of hazardous materials within one-quarter mile of a school, and safety issues associated with nearby public and private airfields are not expected to be significant. However, details regarding the impacts of Phase 2 would be presented as appropriate in a subsequent EIR if the District proposes to implement Phase 2.

[1] A safety zone is the zone established at either end of an airport runway where specific land uses and storage of flammable materials are restricted and can be subject to review by the Airport Land Use Commission of Alameda County (Airport Land Use Commission of Alameda County 1986).

4.7.3 Impacts and Mitigation Measures

Significance criteria used to evaluate potential impacts related to hazards from Phase 2 of the project are the same as those used for Phase 1 in Section 3.7. However, conclusions about impacts related to potential hazards resulting from proximity to environmental cases such as LUSTs cannot be made until locations of Phase 2 facilities are determined.

4.7.3.1 Construction Impacts

Phase 2 Potential Impact 4.7-1. Exposure of construction workers and the public to pre-existing hazardous materials in the soil and groundwater during excavation and dewatering

Phase 2 includes potential future expansion of groundwater facilities up to 10 mgd annual average capacity and would involve the installation of additional injection/extraction wells, associated water treatment facilities, and transmission pipelines, possibly located in Oakland, San Lorenzo or San Leandro. Drilling would be required for installation of the Phase 2 wells, and excavation would be required for the construction of the associated treatment facilities. Trenching would also be required for connection of the Phase 2 wells to the EBMUD distribution system.

Depending on the location of Phase 2 facilities, construction workers and the public could be exposed to pre-existing contamination in the soil or groundwater unless proper precautions are employed. Exposure to hazardous materials during construction of Phase 2 could be mitigated through a strategy similar to that specified for Phase 1: a Phase I Environmental Site Assessment for the well location and associated treatment facilities (with follow-up requirements for a Phase II Environmental Site Assessment and remediation, if required); compliance with the District's Trench Spoils Field Management Practice program for trenching activities; preparation of a materials disposal plan, including a health and safety plan; preparation of a discharge water control and disposal plan; and preparation of a contingency plan with procedures to be followed if previously unidentified contamination is discovered.

Impact Significance: Less than significant after mitigation

4.7.3.2 Operational Impacts

Phase 2 Potential Impact 4.7-2. Accidental release of water treatment chemicals

The water treatment chemicals that would be used during Phase 2 would likely be similar to those used in Phase 1 operation (caustic, sodium hypochlorite, fluoride, ammonia, and bisulfite), though potentially in greater volumes. These are all chemicals typically used at water treatment facilities. They are selected by the industry to provide necessary water treatment and public-health benefits while minimizing the public-health risks associated with their transport, storage, and use.

Regardless of the type of treatment facility constructed, the design would comply with the requirements of the Uniform Fire Code to reduce the potential for release of hazardous materials and/or mixing of incompatible materials that could pose a public-health or water quality risk. Various treatment methodologies could produce hazardous wastes as by-products that would require temporary storage on site with subsequent offsite disposal or recycling in accordance with applicable laws and regulations.

Impact Significance*:* Potentially significant until feasibility/effectiveness of mitigation is determined in a subsequent EIR for Phase 2

4.7.4 References – Hazards

Airport Land Use Commission of Alameda County. 1986. *Alameda County Airport Land Use Policy Plan.* Adopted July 16.

EBMUD. 1999. *Emergency Operations Plan, Basic Plan*. April.

International Fire Code Institute. 1997. Uniform Fire Code.

4.8 Phase 2 Traffic and Transportation

This section evaluates qualitatively the potential impacts related to traffic and transportation for Phase 2 of the project. If EBMUD proceeds with Phase 2, a subsequent EIR will be prepared to evaluate potential impacts associated with the specific locations for Phase 2 facilities.

4.8.1 Setting

Roadways and transit services are located throughout the area where Phase 2 facilities might be located and include freeways, Bay Area Rapid Transit (BART), bus service by Alameda County (AC) Transit, bicycle paths and routes, and sidewalks. Specific roadways and transit services that could be affected by Phase 2 would be identified when Phase 2 facility locations are determined. Traffic studies, including trip generation/distribution estimates and regional roadway system analysis, may be required. Applicable plans and policies, which could include traffic and circulation elements of the City of Oakland and City of San Leandro General Plans and the Alameda County Unincorporated Eden Plan, would be evaluated when Phase 2 facility locations are determined.

4.8.2 Impacts and Mitigation Measures

Significance criteria used to evaluate potential impacts related to traffic and transportation from Phase 2 of the project are the same as those used for Phase 1 in Section 3.8. Operation of Phase 2 would generate vehicle trips for delivery of supplies and operations and maintenance. These operational activities would likely result in an inconsequential amount of additional non-peak hour traffic to the Phase 2 facilities. Potentially significant impacts that could result from construction of Phase 2 facilities such as water treatment facilities or pipelines are described below. Additional impacts not described below could result from implementation of Phase 2; site-specific impacts to traffic and transit service would be evaluated when Phase 2 facility locations are identified.

Phase 2 Potential Impact 4.8-1. Traffic delays during construction resulting from reduced number or width of travel lanes on roads

Construction of pipelines in roadways could temporarily reduce the number of or available width of travel lanes on roads, resulting in short-term traffic delays. With mitigation, this impact would be expected to be less than significant.

Potential mitigation may include the following requirements for construction contractors:

- Develop a Traffic Control Plan for affected roadways and intersections. The Traffic Control Plan shall comply with the requirements, as imposed through encroachment permit, of the agencies with jurisdiction that are directly affected by the proposed construction.
- Develop a map, for public distribution, showing the location of work areas, lane closures and detours, along with proposed construction dates.
- To the extent possible, maintain access to driveways and buildings in the vicinity of project work.

- Designate staging areas for stockpiling of construction materials and storage of construction equipment. Where possible, locate material staging area outside of roadways except during actual construction.
- Comply with the permit requirements of the affected jurisdictions for traffic control lane closures. Restore roads and streets to normal operation outside of working hours or when work is not in progress.
- Have traffic signs, flashing lights, barricades, and other traffic safety devices conform to the requirements of the agency that has jurisdiction.
- Restrict construction activities that significantly affect traffic to non-peak periods, including construction at any key intersections that may be affected.
- Provide flaggers at construction locations on high-volume intersections and congested roads.
- Coordinate construction activities (time of year and duration) to minimize traffic disturbances adjacent to schools and commercial areas.
- Provide information signs on affected roadways in advance of construction activities, describing the work period and detours if required.
- Designate detours for bicyclists and pedestrians in areas where construction equipment movement and material staging areas may expose these populations to injury.

Impact Significance: If and when EBMUD proceeds with Phase 2, a subsequent EIR will be prepared that includes a detailed traffic study identifying location-specific impacts to the transportation system from construction and operation of Phase 2 facilities, and outlining additional mitigation measures to reduce those location specific affects to insignificance. This impact remains potentially significant until feasibility and effectiveness of mitigation is determined in a subsequent EIR for Phase 2.

Phase 2 Potential Impact 4.8-2: Temporarily impeded access to adjacent land uses and streets

Access to driveways and cross streets along the pipeline routes, if located in roadways, would be temporarily blocked because of trenching and paving. Vehicle access would be restored at the end of each work day through the use of steel plates or trench backfilling.

Potential mitigations would include notification to police, fire, and other emergency service providers of the timing, location, and duration of construction activities and the location of detours and lane closures. EBMUD would also consult with local agencies and community members to minimize disruption of auto traffic, bus service and pedestrian access to any sensitive land uses, such as schools, hospitals, and retirement homes, located along a proposed pipeline route.

Impact Significance: Potentially significant until feasibility/effectiveness of mitigation is determined in a subsequent EIR for Phase 2.

4.8.3 References – Traffic and Transportation

No references were used in preparation of this section. See references for Section 3.8.

4.9 Phase 2 Noise

This section evaluates qualitatively the potential impacts related to noise for Phase 2 of the project. If EBMUD proceeds with Phase 2, a subsequent EIR will be prepared to evaluate potential impacts associated with the specific locations for Phase 2 facilities.

4.9.1 Setting

Sources of noise, existing noise levels, and the locations of sensitive receptors for the Phase 1 facilities were described in Section 3.9.2. This section describes sources of noise, existing noise levels, locations, and sensitive receptors for Phase 2 facilities that have yet to be located.

4.9.2 Impacts and Mitigation Measures

Significance criteria used to evaluate potential impacts related to noise from Phase 2 of the project are the same as those used for Phase 1 in Section 3.9. Construction noise impacts are generally localized and would temporarily affect sensitive receptors in the immediate vicinity of Phase 2 facilities temporarily. Operational impacts would depend on whether Phase 2 calls for a central treatment facility or small treatment facilities at wellheads, distributed over a large geographic area.

4.9.2.1 Construction Impacts

Phase 2 Potential Impact 4.9-1. Temporary noise increases at nearby noise-sensitive receptors from construction activities

Noise levels for typical construction equipment at 25, 50, and 100 feet from the noise source are shown in Table 3.9-6 in Section 3.9. Noise levels range from about 76 to 88 dBA at a distance of 50 feet from the source, with slightly higher levels of about 88 to 91 dBA for certain types of earthmoving and impact equipment. Pile drivers can generate noise peaks of approximately 101 dBA at 50 feet. If and when the locations of Phase 2 facilities are determined, additional evaluation in a subsequent EIR will be needed to determine proximity of noise-sensitive receptors to proposed facilities and to evaluate the potential for construction noise to exceed noise ordinance limits and interfere with speech or sleep.

The locations of Phase 2 facilities are currently unknown. If a central treatment plant is located on EBMUD’s site on the south side of Grant Avenue, existing habitat for the clapper rail and black rail at the mouth of San Lorenzo Creek and at the west end of Bockman Canal could be adversely affected.

Mitigation Measure 4.9-1. Potential mitigation could include the following measures to minimize construction noise impacts:

- Locate construction staging areas away from any nearby sensitive receptors to the extent feasible.
- In noise-sensitive work areas, fit equipment with best practically available noise control technology (including mufflers, intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds).

- Use hydraulically or electrically powered impact equipment (e.g., jack hammers, pavement breakers, and rock drills) for project construction wherever possible to avoid the noise associated with compressed-air exhaust from pneumatically powered tools. Fit pneumatically powered tools with a muffler on the compressed-air exhaust unit. Use external jackets on the tools where feasible.
- Designate a specific EBMUD point of contact with authority to investigate and resolve construction-related noise complaints.
- If any project facilities are located near sensitive biological habitat, avoid high noise impact construction activities during critical periods such as the breeding season of sensitive species.

Impact Significance: Potentially significant until feasibility/effectiveness of mitigation is determined in a subsequent EIR for Phase 2

4.9.2.2 Operational Impacts

Phase 2 Potential Impact 4.9-2. Increase in ambient noise from operation of proposed facilities

Operational noise impacts would depend on whether Phase 2 calls for a central treatment facility or small treatment facilities at wellheads, distributed over a large geographic area. In either case, it is anticipated that the primary sources of noise from Phase 2 operations would be pumps and transformers, which have the potential to generate the following noise levels:[1]

- Central Treatment Facility: 80.3 dBA (L_{eq}) at 50 feet;
- Well Facility (Aboveground Pump and Transformer): 72.0 dBA (L_{eq}) at 50 feet; and
- Well Facility (Enclosed Pump and Transformer): 47.3 dBA (L_{eq}) at 50 feet.

The potential noise impacts of Phase 2 facilities would ultimately depend on four major variables:

- Characteristics of the equipment (e.g., technology type, rated Hp, revolutions per minute (rpm), presence or absence of pure tones, directional characteristics of the noise source, and presence or absence of acoustical design features);
- Number of noise sources clustered together;
- Type and effectiveness of the building enclosure; and

[1] Pump reference noise levels for a central treatment facility assume operation of one 60-Hp reclaim tank pump (67 dBA), one 3-Hp reclaim tank pump (54 dBA), five 350-Hp clearwell turbine pumps assumed to be aboveground (74 dBA each; 80 dBA for four operating and one on standby), ten chemical feed pumps (five 2 Hp and five 70–200 gallons per day) in the Chemical and Control Building, and one 2,000-kilovolt (approximate size) transformer (53 dBA). To evaluate worst-case conditions, this analysis assumes that (1) all above-listed equipment would operate simultaneously 24 hours per day, (2) all equipment would be located at the project boundary closest to the receptor, and (3) no reduction would be applied to any intervening development that interrupts the line of sight between the noise source and receptors. Estimated noise levels are based on a reference noise level of 69 dBA (L_{eq}) for a 1,800-rpm, 100-Hp pump (Bruce and Moritz 1997). This level was adjusted for the proposed Hp rating of proposed pumps to establish an average pump noise level (L_{eq}) as follows: $L_{eq\,1} = L_{eq\,R} + K * \log (HP_1/HP_R)$, where HP_1 and HP_R are the horsepower ratings of the candidate and reference pumps and K is a pump constant.

- Operational characteristics (steady 24-hour operation, intermittent operation, variable settings at different times, etc.).

Because locations of Phase 2 facilities are currently unknown, the proximity of noise-sensitive receptors and the potential noise impacts on these receptors cannot be determined at this time. If and when Phase 2 facilities are proposed, additional review of those facilities in a subsequent EIR will be needed to determine proximity of sensitive receptors and to estimate increases in ambient noise levels at these receptors from operation of the proposed facilities. Estimated levels will need to be compared to exterior noise exposure standards in applicable noise ordinances to determine the significance of any increases in ambient noise levels resulting from operation of project facilities.

Mitigation Measure 4.9-2. As part of a subsequent EIR for Phase 2, a detailed noise study will be conducted to identify potential noise-sensitive receptors, estimate potential increases in ambient noise levels from operation of project facilities, and outline mitigation measures, as necessary, to comply with applicable noise ordinance standards.

Impact Significance: Potentially significant until feasibility/effectiveness of mitigation is determined in a subsequent EIR for Phase 2

4.9.3 References – Noise

Bruce, R.D. and C.T. Moritz. 1997. "Sound Power Level Predictions for Industrial Machinery." *Encyclopedia of Acoustics*. Chapter 86. New York: Wiley & Sons.

4.10 Phase 2 Utilities

This section evaluates qualitatively the potential impacts related to utilities for Phase 2 of the project. If EBMUD proceeds with Phase 2, a subsequent EIR will be prepared to evaluate potential impacts associated with the specific locations for Phase 2 facilities.

4.10.1 Setting

The setting for utilities for Phase 2 of the project is the same as the setting for utilities for Phase 1 (Section 3.10) with inclusion of the following paragraph:

EBMUD supplies potable water treatment and delivery services and wastewater collection, treatment and disposal services to customers in the City of Oakland. The City of Oakland maintains its own storm drain and sanitary sewer collection systems (City of Oakland 2004).

4.10.2 Impacts and Mitigation Measures

The significance criteria described in Section 3.10 for Phase 1 of the project were used to evaluate potential impacts to utilities from Phase 2. Impacts to utilities from Phase 2 could include increased demand for water for backflush of new wells; increased discharge to the sanitary sewer system from filter backwash; increased demand for electricity for pumping; increased discharge to storm drain systems from increased impervious surfaces or backflush water; and generation of large quantities of construction or demolition debris. Impact conclusions regarding these potential impacts cannot be made at this time. The level of significance of these impacts will be evaluated when Phase 2 facilities are sized and located.

Phase 2 Potential Impact 4.10-1. Relocation of utility lines

Numerous utility lines of varying sizes could be located along the pipeline alignments that could be included as part of Phase 2. All utility lines and cables that could be disrupted during construction of facilities for Phase 2 would be identified during the preliminary design phase. EBMUD will notify and coordinate with the service providers to reduce the risk of accidental damage to these facilities. EBMUD will work with utility providers to avoid, where possible, planned disruption of services during critical construction work. Where planned service interruptions cannot be avoided, these temporary impacts would be preceded by notification to customers.

Mitigation Measure 4.10-1. In cooperation with local utility service providers, locate all underground utilities in advance of excavation. Notify owners of underground utilities in the area of proposed pipe installation of the nature, extent, and duration of construction activities. Coordinate design efforts with other service agencies to avoid disruption of existing utility lines. If relocation of existing utility lines is required, coordinate with the appropriate service agency to determine relocation requirements and to identify options to avoid or minimize service outages.

Use hand tools as necessary to avoid damage to buried utility lines and appurtenances.

If planned utility service outages are necessary, provide advance notice to affected utility customers.

Impact Significance: Whether Phase 2 will affect utilities cannot be identified at this time. However, based on presently available information, the potential impacts, if any, could be reduced to a less than significant level through the implementation of the mitigation measure discussed above.

4.10.3 References – Utilities

City of Oakland, California. 2004. http://www.oaklandpw.com/infrastructure_maintenance.htm#storm

4.11 Phase 2 Cultural Resources

This section evaluates qualitatively the potential impacts on cultural resources for Phase 2 of the project. If EBMUD proceeds with Phase 2, a subsequent EIR will be prepared to evaluate potential impacts associated with the specific locations for Phase 2 facilities.

4.11.1 Setting

As described in Section 3.11, cultural resources include prehistoric and historic archaeological sites and objects, historic buildings, known locations of important historic events, and sites of traditional or cultural importance to various groups. A range of prehistoric and historic cultural resources is likely present within the area where Phase 2 facilities might be constructed. Technical studies, including records searches and site surface investigations, would be required to determine what specific cultural resources, if any, are present at potential Phase 2 facility locations, once locations are identified.

4.11.2 Impacts and Mitigation Measures

The significance criteria described in Section 3.11 for Phase 1 were used to evaluate potential impacts from Phase 2 of the project.

Phase 2 Potential Impact 4.11-1. Impacts on prehistoric or historic cultural resources

Cultural resources are likely to be present within the area where Phase 2 facilities might be constructed. Potential impacts to any cultural resources and any necessary mitigation measures cannot be determined until specific Phase 2 facility locations are identified and technical studies completed.

Impact Significance: Potentially significant until potential for impact and feasibility of appropriate mitigation is determined in a subsequent EIR for Phase 2.

Phase 2 Potential Impact 4.11-2. Unanticipated discovery of subsurface archaeological deposits

Construction activities have the potential to reveal as-yet undiscovered materials by disturbing subsurface soils. Such disturbance could result in the loss of integrity of cultural deposits, loss of information, and alteration of a site setting. Significance of this impact may depend on the presence of known cultural resources at or near Phase 2 facility locations and cannot be determined at this time.

Implementation of Mitigation Measure 3.11-1 described in Section 3.11 may reduce the level of potential impacts.

Impact Significance: The impact of Phase 2 associated with the unanticipated discovery of subsurface archaeological deposits cannot be identified until the location of Phase 2 facilities is known. However, to the extent that any impacts may occur, they may be reduced to a less than significant level through the implementation of the mitigation measure discussed above.

4.11.3 References – Cultural Resources

No references were used in the preparation of this section. See references for Section 3.11.

4.12 Phase 2 Land Use

This section evaluates qualitatively the potential effects on land use for Phase 2 of the project. If EBMUD proceeds with Phase 2, a subsequent EIR will be prepared to evaluate potential impacts associated with the specific locations for Phase 2 facilities.

4.12.1 Setting

Land use and planning impacts would be determined by evaluating Phase 2's consistency with local and regional land use plans and policies as well as Phase 2's compatibility with adjacent and planned land uses. The Phase 2 facilities may be located in the industrial zone at the westerly end of Grant Avenue or at venues within a broader area including San Lorenzo, San Leandro, and the southern part of Oakland. These areas contain a range of land uses, including industrial, commercial, residential, and open space (which includes parks and golf courses).

Because Phase 2 development would entail construction of facilities for the production, treatment, generation, storage, and transmission of water, the location and construction of the facilities would be exempt from zoning and building ordinances of local jurisdictions (California Government Code 2004, Sections 53091, 53095, and 65402). However, EBMUD works with host jurisdictions and neighboring communities during project planning and strives to conform to local land use plans and policies where feasible. Consistency with existing land uses and with zoning requirements would need to be evaluated when Phase 2 facility locations are determined.

4.12.1.1 City of San Leandro

If Phase 2 facilities are located in San Leandro, they may be developed in an industrial portion of the city. San Leandro General Plan's Land Use Element includes the designation General Industrial (City of San Leandro 2002; Rogers 2003). Land uses within this designation are categorized by a wide range of manufacturing, transportation, warehousing, vehicle storage, and distribution uses.

The stated goal of the San Leandro General Plan for areas designated as General Industrial is to "[c]ontinue to develop a strong and healthy industrial and office employment base in the community." Policies and actions described by the General Plan to support this goal involve the facilitation of adaptive reuse of vacant or underutilized industrial facilities. The city's infrastructure goal states that it should "[e]nsure that local water, sewer, storm drainage, and solid waste facilities are well maintained; improvements meet existing and future needs; and land use decisions are contingent on the adequacy and maintenance of such facilities." Use of vacant or underutilized industrial lands for Phase 2 facilities would be consistent with these goals and policies.

Phase 2 of the project will, in part, enable the city to meet its industrial, business-related, and infrastructure goals by providing a supplemental source of water to EBMUD customers during drought periods, thereby reducing the economic hardships associated with drought-related water shortages.

4.12.1.2 City of Oakland

The City of Oakland's General Plan Land Use and Transportation Element includes improvement strategies for the major areas of the city (City of Oakland 1998). Development in the southern portion of Oakland is guided by implementation strategies for the San Antonio/Fruitvale/Lower Hills and East Oakland Areas. The implementation strategies for the East Oakland Area include objectives to address blighted properties and conflicts between residential and heavy industrial land uses, and to promote redevelopment. The implementation strategies for the San Antonio/Fruitvale/Lower Hills Area include objectives to focus commercial revitalization in specific areas, especially on underutilized properties, revitalize corridors, and improve the waterfront connection.

4.12.1.3 San Lorenzo (Unincorporated Alameda County)

San Lorenzo is within the Eden Planning Unit, which is under the jurisdiction of Alameda County. The Alameda County General Plan was amended in 1981 by the General Plan for the Central Metropolitan, Eden, and Washington Planning Units (Alameda County 1981), which includes land use goals and policies for the Phase 2 area. The Alameda County General Plan was subsequently amended in 1983 by the Unincorporated Eden Area (Portion) Plan (Alameda County 1983), which guides the physical development of the Eden Planning Unit. Both these plan amendments supplement the Alameda County General Plan. The county is in the process of updating the Eden Area portion of the General Plan.

The Alameda County Redevelopment Agency, which adopted the Eden Area Redevelopment Plan in 2000, is responsible for eliminating blight and increasing redevelopment opportunities in the county. The redevelopment plan established five redevelopment areas, including San Lorenzo. Planned land uses include suburban, low-density residential, and industrial.

Phase 2 meets the following goals and objectives stated in the 1981 General Plan for the Central Metropolitan, Eden, and Washington Planning Units:

- Goal 3. To promote the health, safety, and welfare of the population through the provision of public services and facilities; and
- Goal 12. To minimize damage to property resulting from environmental hazards, including natural disasters.

Phase 2 also meets Public Facilities and Services Policies, Objective 1:

- To ensure the efficient provision of public facilities and services adequate to meet the needs of area residents and businesses.

Phase 2 would promote the health, safety, and welfare of the population by providing a supplemental source of water for use during drought periods that would reduce the risks associated with drought-related, frequent, and severe water shortages.

Construction of Phase 2 facilities would generate noise, vibration, and dust and would temporarily disrupt existing traffic and circulation patterns within established residential and commercial communities. These temporary impacts are a necessary consequence of providing public services to protect public health and safety.

4.12.2 Significance Criteria and Impact Analysis Methodology

Appendix G of the CEQA Guidelines states that a project is considered to have a significant land use impact if it would:

- Convert prime agricultural land to nonagricultural use or impair the agricultural productivity of prime agricultural land;
- Physically divide an established community;
- 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; or
- Conflict with established recreational, educational, religious, or scientific uses of an area. A project may also have the potential to result in significant effects if it would be incompatible with existing land uses in the project vicinity in terms of environmental impacts (e.g., noise).

4.12.3 Impacts and Mitigation Measures

Impact conclusions regarding compatibility with existing land uses and policies cannot be made until Phase 2 facility locations are determined.

Impact Significance: Potentially significant until potential for impact and feasibility of appropriate mitigation is determined in a subsequent EIR for Phase 2.

4.12.4 References – Land Use

Alameda County. 1981. *General Plan for the Central Metropolitan, Eden, and Washington Planning Units*.

_____. 1983. *Unincorporated Eden Area Plan*.

California Code of Regulations. 2004. Title 14. Chapter 3: “Guidelines for Implementing the California Environmental Quality Act.”

California Government Code. 2004. Sections 53091, 53095, and 65402.

City of San Leandro. 2002. *City of San Leandro General Plan*. http://www.ci.san-leandro.ca.us/sldevsvcsGP.html. August 8.

City of Oakland. 1998. *City of Oakland General Plan*, Land Use and Transportation Element. March.

Rogers, Christopher, Assistant Planner, City of San Leandro Planning Department. 2003. Personal communication on August 12.

4.13 Phase 2 Visual and Aesthetic Resources

This section evaluates qualitatively the potential impacts related to visual and aesthetic resources for Phase 2 of the project. If EBMUD proceeds with Phase 2, a subsequent EIR will be prepared to evaluate potential impacts associated with the specific locations for Phase 2 facilities.

4.13.1 Setting

Facilities required for Phase 2 would be located within the urbanized East Shore plain, which extends south from the cities of Berkeley and Oakland to Newark and Fremont. The East Bay Hills, reaching elevations of 1,500 feet and higher, define the plain's eastern edge. The San Francisco Bay and the East Bay Hills are prominent natural features that define the region's landscape. I-880, a major transportation corridor along the East Shore and another defining regional landscape element, forms a spine for the area's urban development pattern, which is a mixture of industrial, commercial, public-service, and residential uses. The site-specific visual character of Phase 2 within this setting would depend on the locations and designs selected for the Phase 2 facilities.

Three adopted public planning documents describe policies relevant to aesthetic quality in the area where the Phase 2 facilities might be located. These are summarized below for informational purposes. Consistency with the plan policies would need to be evaluated when Phase 2 facility locations and designs have been selected.

4.13.1.1 Alameda County

The General Plan for the Central Metropolitan, Eden, and Washington Planning Units (Alameda County 1981) establishes land use policies for the areas in unincorporated Alameda County, including San Lorenzo, where Phase 2 facilities might be located. The following general plan principle addresses aesthetic quality in Unincorporated Alameda County:

> Principle 3.8 states that new development should be planned and constructed to fit and take advantage of conditions on-site and in the vicinity. The objectives to accomplish this principle state that projects should be compatible in design, use of materials, and landscaping with the surrounding development. The objectives also state that landscaping should be used to blend structures with the natural landscape and protect views of scenic areas (Alameda County 1981).

4.13.1.2 City of San Leandro

The City of San Leandro General Plan (City of San Leandro 2002) recognizes the importance of aesthetic and cultural resources by providing policies to guide urban development and "promote a stronger sense of place in San Leandro" (Goal 42, page 319). To that end, the following policy is pertinent to aesthetic resources in the areas within the City of San Leandro where Phase 2 facilities might be located:

> Policy 43.07: Improve the visual appearance of the City's commercial and industrial areas by applying high standards of architectural design and landscaping for new

commercial and industrial development and the re-use or remodeling of existing commercial and industrial buildings.

4.13.1.3 City of Oakland

The City of Oakland General Plan Land Use and Transportation Element does not contain policies or objectives specific to visual resources (City of Oakland 1998). However, many policies and objectives, such as redevelopment of blighted areas and pursuing environmental cleanup, address aesthetics indirectly. Although the General Plan includes a Scenic Highway element, no scenic highways are located in the Phase 2 area.

4.13.2 Significance Criteria and Impact Analysis Methodology

As required by CEQA, the visual impact evaluation considers potential effects on publicly accessible views. As stated in Appendix G of the CEQA Guidelines, a project is considered to have a significant effect on the environment if it would:

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

The significance determinations would be based on consideration of the degree to which Phase 2 facilities would be visible from key public vantage points, the degree of visual contrast and the compatibility in scale and character between Phase 2 elements and their surroundings, and the sensitivity of any affected view. The consistency of Phase 2 with adopted public policies regarding visual and urban design quality would also be taken into account.

4.13.3 Impacts and Mitigation Measures

Impact conclusions regarding Phase 2 facilities cannot be reached because the significance of visual and aesthetic impacts will depend on the size, design, and specific location of facilities. Site-specific analysis will need to be completed when Phase 2 facilities are designed and located. Site-specific impacts could include impacts from nighttime lighting, glare, shadows, changes in visual character, and obstruction of views. Mitigation measures could include minimization of nighttime lighting, use of non-reflective finishes, minor modifications to facility location or design, and/or landscaping and screening vegetation.

To reduce the visual effects of construction activity, EBMUD standard practice for construction crews and contractors requires the following: a) maintain construction sites and all stored items in a neat and orderly condition; b) dispose of refuse as often as necessary so that at no time will there be any unsightly accumulation of rubbish; c) sweep the street in the work area; and d) remove scrap material, debris, and waste from the job site.

Impact Significance: Whether impacts to visual and aesthetic resources would occur as a result of Phase 2 cannot be determined at this time and are therefore considered potentially significant until impact analysis and feasibility of appropriate mitigation is determined in a subsequent EIR for Phase 2.

4.13.4 References – Visual

Alameda County. 1981. *General Plan for the Central Metropolitan, Eden, and Washington Planning Units*.

California Code of Regulations. 2004. Title 14. Chapter 3: "Guidelines for Implementing the California Environmental Quality Act."

City of Oakland. 1998. *City of Oakland General Plan*, Land Use and Transportation Element. March.

City of San Leandro. 2002. *City of San Leandro General Plan*.

5.0 Growth-inducing Impacts

CEQA Guidelines Section 15126[d] requires that an EIR evaluate the growth-inducing impact of a proposed project. Section 15126.2(d) provides the following guidance for the discussion of growth-inducing impacts:

> Discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth… Increases in the population may further tax existing community service facilities so consideration must be given to this impact. Also discuss the characteristics of some projects which may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.

The environmental effects of a proposed project's induced growth are secondary or indirect effects such as significantly increased demand on public services and infrastructure, significantly increased traffic or noise, or degradation of air and water quality.

A variety of factors influence growth, including the general plans and policies of local cities and counties and/or the availability of utilities, public schools, and transportation services. Water supply is one of the key public services needed to support urban development, and a service capacity deficiency could constrain future development. Conversely, a water supply project could be an impetus to development by providing the necessary incentive to resolve other constraints on growth.

5.1 Approach to Analysis

This growth-inducement analysis evaluates qualitatively the potential of Phases 1 and 2 of the project to induce growth. The evaluation considers the characteristics of the project and whether those characteristics are capable of contributing to factors that could directly or indirectly cause growth within the District's Ultimate Service Boundary (USB) (see Figure 1-1 in Section 1). This analysis evaluates whether the project would directly or indirectly:

- Foster economic, population, or housing growth;
- Remove obstacles to growth;
- Burden community service facilities; or
- Encourage or facilitate other activities that cause significant environmental effects.

The evaluation is based on the estimated growth projections within the EBMUD USB. These projections were presented in the Updated WSMP EIR that evaluated alternative ways to provide an adequate water supply at the projected year 2020 level of development. The WSMP based its growth forecast on data from the Association of Bay Area Governments (ABAG), California Department of Finance, and local government agencies.

5.2 Growth Projections

The Updated WSMP EIR projected that between 1990 and 2020, the number of households in the USB would increase by 79,000, accommodating an estimated population increase of 137,000.[1] During the same period, the number of commercial, institutional, industrial, and major irrigator accounts is expected to increase by 5,600 (EDAW 1993, Volume 1, page 13-5).

5.3 Evaluation of Potential Growth-inducing Impacts

EBMUD's current water sources meet anticipated 2020 demand in normal water years with no supplemental supply required. In consecutive dry years, however, available water in storage will diminish, and rationing will be required to meet demand. The Bayside Project would not supply supplemental water for customers during normal years, nor would it increase the capacity of the distribution system or otherwise expand the District's infrastructure in direct support of new population or economic expansion.

Discussions of whether improvements in water supply reliability could induce growth often result in differences of opinion; therefore, this topic is considered an area of controversy under the State CEQA Guidelines (Section 15123[2]). Because growth inducement cannot be predicted with certainty, this analysis conservatively assumes that any increase in water supply reliability associated with the project would permit cities and counties within the USB to accommodate growth that has been projected and planned for within their respective jurisdictions and would thereby result in secondary growth-inducing impacts. This assumption was made to disclose the environmental impacts associated with growth in the event that implementation of the project ultimately results in growth-inducing effects. The potential impacts are described in Section 5.4.

5.4 Impacts and Mitigation Measures

Impact 5-1. Secondary effects from increased water supply reliability, which incidentally accommodates planned growth

The Bayside Groundwater Project is intended to relieve the effects on EBMUD customers of water rationing during extended drought conditions. Although it is debatable whether the project would be growth inducing given its applicability only during drought, in the event that implementation of the project ultimately does lead to growth-inducing effects, it would only contribute to effects associated with planned and approved population growth within the USB. The local governments within the USB must evaluate each development plan within their purview, assess its environmental impacts, and ultimately approve or disapprove growth. It is the responsibility of local governments to choose whether to mitigate for negative impacts of growth they have approved within their jurisdictions.

The following potential impacts are associated with growth inducement:

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[1] The Districtwide Update of Water Demand Projections (2000 Demand Study) was completed in 2000 (EBMUD 2000). The methodology and approach used in the 2000 Demand Study, such as community-level area studies, enabled EBMUD to prepare demand projections that were more detailed than those provided in the WSMP. The results of the 2000 Demand Study confirmed the validity of the demand projections in the WSMP.

- **Land Use Changes.** Land use changes include urban infill and increased population density in the western portion of the USB, and new development that would occur mainly in the eastern undeveloped areas.
- **Traffic Impacts.** Traffic in the USB would increase because of new development and increases in visitor travel and truck traffic serving the region.
- **Air Quality Impacts.** Local air quality would continue to decline as a result of population growth and increased traffic. The San Francisco Bay Area Air Basin is designated as a "nonattainment" area for ozone (also see Section 3.6, Air Quality), which is in part attributable to vehicle emissions.
- **Biological Impacts.** The conversion of undeveloped land to homes, roads, businesses, and other uses would adversely affect habitats and associated wildlife.

Other potential impacts from growth include possible urban runoff effects of development from increases in impermeable surfaces, disturbance of known or unknown cultural resources because of ground disturbance, increased temporary noise impacts because of construction, visual resource impacts because of development of currently undeveloped areas, and consumption of energy and natural resources.

Mitigation Measure 5-1. To assist local governments in mitigating the growth-related impacts of their land use decisions, the District will:

- Participate in efforts to improve regional planning in the Bay Area;
- Encourage local land use planning agencies to coordinate land use planning functions and provision of utility services; and
- Encourage cities and counties to adopt General Plans and zoning ordinances that favor high-density development and urban infill (which tends to minimize per-capita water use as well as costs and environmental impacts of water delivery systems); provide incentives for more housing near public transit; and adopt ordinances that conserve open space, protect wildlife habitat, and conserve energy and water resources.

Impact Significance. Less than significant after mitigation

5.5 References

California Code of Regulations. 2004. Title 14. Chapter 3: "Guidelines for Implementing the California Environmental Quality Act."

EDAW, Inc. 1993. *Final EIR for the Updated Water Supply Management Program (WSMP): Prepared for East Bay Municipal Utility District*.

EBMUD. 2000. *Urban Water Management Plan*.

6.0 Cumulative Impacts

In accordance with Section 15130(a) of the CEQA Guidelines, this DEIR discusses the cumulative impacts of the Bayside Groundwater Project. CEQA Guidelines Section 15130.3[b] states that "the discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone…the discussion should be guided by standards of practicality and reasonableness." CEQA Guideline Section 15355 defines cumulative impacts as follows:

> "Cumulative impacts" refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

6.1 Approach to Analysis

This cumulative impact analysis addresses only the potential cumulative impacts of Phase 1 of the project. The cumulative impacts of Phase 2 are not analyzed in this DEIR because the location and design of Phase 2 facilities are not known at this time. If in the future EBMUD elects to proceed with Phase 2, a subsequent EIR would be prepared at that time, which would include a Phase 2 cumulative impacts analysis. Such an approach is authorized by CEQA Guideline Section 15145, which states that "[i]f , after thorough investigation, a Lead Agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate discussion of the impact."

In accordance with the CEQA Guidelines Section 15130.1, this cumulative impact analysis includes:

- An analysis of related projects that would affect resources in the Phase 1 project area similar to those affected by Phase 1;
- A summary of the expected environmental effects to be produced by those projects;
- A reasonable analysis of the cumulative impacts, including the geographic scope of such impacts, of the relevant projects; and
- An examination of reasonable, feasible options for mitigating or avoiding Phase 1's contribution to any significant cumulative effects.

The list of projects that could contribute to cumulative impacts was developed by contacting state and local public agencies and utilities and reviewing environmental reports completed for actions within the Phase 1 project area. The agencies and utilities that were contacted include:

- City of San Leandro
- Alameda County
- Caltrans
- Oro Loma Sanitary District
- Livermore-Amador Valley Water Management Agency (LAVWMA)
- City of Hayward
- Alameda County Water District

The final list of related projects in Section 6.2 includes those that could produce related or cumulative impacts to the same environmental resources that would be impacted by Phase 1 of the project.

6.2 Related Projects

Table 6-1 lists the projects that are included in this cumulative impact analysis. The table briefly describes the action(s) expected during the implementation phase of each project and the project location and construction schedule.

TABLE 6-1
Related Projects Included in Cumulative Impact Analysis

Project	Location	Construction Schedule	Brief Description
Hayward Intertie Project	Hayward	Winter 2005 through Summer 2006	Construction of pump station in City of Hayward and 1.5 miles of pipeline to connect EBMUD and Hayward water systems
Wastewater Treatment Plant Capacity Restoration Project	San Lorenzo	Spring 2004 through 2006	Expansion of OLSD/Castro Valley Sanitary District wastewater treatment plant capacity from 15 mgd to 20 mgd
Export Pipeline Facilities Project	San Leandro	Fall 2004 through 2005	Installation of segment of new regional wastewater outfall pipeline; abandonment of existing pipe along Lewelling Boulevard

Sources: Jagtar 2003, Lepere 2003, Andrade 2003, Rogers 2003, Allen 2003, Wynne-Jones 2003, LAVWMA 20004, EBMUD 2004

6.2.1 Hayward Intertie Project

Project sponsor: SFPUC, City of Hayward, and EBMUD under a joint powers agreement.

A new pumping plant and pipelines to join the EBMUD and Hayward distribution systems will be constructed within the Hayward city limits. Construction activity may overlap with the construction period for Phase 1 of the Bayside Project. Temporary construction activities would result in local air quality, hazards, noise, water quality, biological resources, cultural, and traffic impacts. Operation of the Intertie project would result in local air quality impacts. The Initial Study and Mitigated Negative Declaration (ESA 2002) include mitigation measures that would reduce all significant impacts to less than significant levels.

6.2.2 Wastewater Treatment Plant Capacity Restoration Project

Project sponsor: OLSD

The Wastewater Treatment Plant Capacity Restoration Project will be constructed just south of the proposed Phase 1 facilities. Construction will begin prior to and will then overlap with the early stage of Bayside project construction. The capacity of the existing OLSD wastewater treatment plant will be expanded from 15 to 20 mgd to meet the RWQCB's current secondary wastewater treatment requirements (Berryman & Henigar 2003). Proposed facilities include three 120-foot-diameter secondary clarifiers, an expanded chlorine contact tank, a pump station, and pipelines connecting the new facilities. Secondary effluent will flow to the onsite pumping station, where it is pumped through a dechlorination facility near the San Leandro Marina to San Francisco Bay. OLSD's current permit with the RWQCB covers the plant's discharge of up to 20 mgd into the Bay.

All of the proposed facilities will be constructed on the existing wastewater treatment plant site in areas that are currently hard surfaced or graded, and all of the new facilities will be entirely contained within the perimeter of existing earthen berms (Berryman & Henigar 2003). Although the new facilities will appear to be an integral part of the treatment plant, they will be visible to Bay Trail users. Other environmental impacts related to the treatment plant expansion include potential impacts on burrowing owls, potential hazardous materials impact during construction, and air quality and noise impacts. The Initial Study (Berryman & Henigar 2003) proposed mitigation measures to reduce significant impacts to less than significant levels.

6.2.3 Export Pipeline Facilities Project

Project sponsor: LAVMWA

LAVWMA is scheduled to complete construction of the portion of the Export Pipeline Facilities Project along Lewelling Boulevard in San Leandro prior to initiation of Phase 1 construction. The Export Pipeline project is regional in scope and includes a number of new and expanded facilities. The Lewelling Boulevard/San Leandro portion of the project will include installation of a new outfall pipeline to the Bay and removal of an existing obsolete pipe within the same alignment. The project portion within San Leandro would have short-term impacts on surface water quality, noise, air quality, land use, traffic, and visual resources (ESA 1998). The project EIR (ESA 1998) includes mitigation measures to reduce most significant impacts to less than significant levels; traffic impacts during construction are considered significant and unavoidable.

6.2.4 Projects Not Included in This Analysis

The following projects were considered for inclusion in this cumulative impact analysis but were rejected for the reasons described below:

- **Freeport Regional Water Project.** This project would not affect the same environmental resources as the Proposed Project because it is not a groundwater injection/extraction project and it is located in a distant geographic area.

- **Bay Area Regional Desalination Project.** This project is currently in the preliminary, conceptual planning stage, and project feasibility has not yet been determined. The location and environmental setting for any desalination project cannot be determined with sufficient certainty to be included in this cumulative impact analysis. However, it is included as an alternative to the project, to form the basis of a reasonable range of alternatives.

6.3 Cumulative Impacts and Mitigation Measures

The subsections below describe the cumulative impacts related to Phase 1 of the project and mitigation measures if necessary.

6.3.1 Groundwater Hydrology and Quality

The geographic scope for groundwater hydrology and quality is the East Bay Plain and Niles Cone groundwater basins. As described in Section 3.1, proposed groundwater injection and extraction could affect the regional groundwater system and affect existing well users including ACWD and the City of Hayward. All potentially significant impacts would be less than significant with mitigation.

None of the projects listed in Table 6-1 would result in groundwater hydrology and quality impacts. Therefore, no cumulative impacts on groundwater hydrology and quality would result from implementation of Phase 1, and no mitigation measures would be required.

6.3.2 Water Quality, Treatment, and Distribution

The geographic scope for water quality, treatment, and distribution is the District's service area. As described in Section 3.2, although no primary MCLs would be exceeded, the Phase 1 of the project could result in water quality changes. All impacts would be less than significant with mitigation.

None of the projects listed in Table 6-1 would result in drinking water quality impacts. Therefore, no cumulative impacts on water quality, treatment, or distribution would result from implementation of Phase 1, and no mitigation measures would be required.

6.3.3 Surface Water Hydrology and Quality

The geographic scope for surface water hydrology and quality is the project site, as shown in Figure 2-1 in Section 2, plus receiving waters. As described in Section 3.3, construction of Phase 1 would result in increased potential for sedimentation and equipment pollutants to contact storm water and be conveyed to receiving waters. Well development and excavation would result in discharges of groundwater to receiving waters. Project operation would result in periodic discharges backflush water to the local storm drain system, long-term increases in stormwater runoff, and diversion of runoff from USL Reservoir watershed during wet years. All potentially significant impacts would be less than significant with mitigation. All of the projects listed in Table 6-1 would result in increased erosion and sedimentation during construction, which could increase turbidity and decrease water quality in local receiving waters. With the exception of the Export Facilities Pipeline Project, all projects, including Phase 1, incorporate measures to reduce significant impacts to less than significant levels. The Export Facilities Pipeline Project could result in a significant, unavoidable impact to San Lorenzo Creek if LAVWMA discharges to the creek in emergency situations.

Phase 1 would not affect the water quality within San Lorenzo Creek, and Phase 1's surface water hydrology and quality impacts are not cumulatively considerable. No cumulative impacts on surface water hydrology and quality would result from implementation of Phase 1. No mitigation measures would be required.

6.3.4 Biological Resources

The geographic scope for biological resources encompasses the aquatic and avian resources in Bockman Canal, San Lorenzo Creek, and the San Leandro shoreline wetlands as shown on Figure 3.4-1. All potentially significant impacts from Phase 1 would be less than significant with mitigation.

The Export Facilities Pipeline Project will also affect biological resources in the Bay shoreline area, including jurisdictional wetlands; however, construction of this project is near completion and is expected to be finished prior to the initiation of Phase 1 construction. Construction noise from development of the OLSD project could disturb avian nesting and sheltering habitat during certain seasons, as could Phase 1 of the Proposed Project; however, the distance between potential bird habitat and construction during Phase 1 is not expected to result in a significant impact as described in Section 3.4. Because these developments will overlap only briefly, if at all, their impacts are more individual than cumulative. Mitigation measures to protect biological resources from construction activity are found in the respective environmental documents for these projects. Therefore, impacts on biological resources would not be cumulatively considerable, and no additional mitigation measures would be required.

6.3.5 Geology, Soils, and Seismicity

The geographic scope for geology, soils, and seismicity is the construction footprint of Phase 1 facilities. All projects in Table 6-1, as well as Phase 1 of the Proposed Project, would be subject to seismic hazards. As described in Section 3.5, Phase 1's potential seismic hazards would be mitigated to less than significant levels. They therefore would not be cumulatively considerable. No cumulative impacts on geology, soils, and seismicity would result from implementation of Phase 1. No mitigation measures would be required.

6.3.6 Air Quality

The geographic scope for air quality is the Bay Area Air Basin. As described in Section 3.6, Phase 1 could affect ambient air quality during construction. Operation of Bayside Well No. 1 would result in almost no air emissions because pumps are electrically powered and require insignificant maintenance. Construction impacts are generally localized and would temporarily affect sensitive receptors only in the immediate vicinity of any project component; implementation of Basic Control Measures during construction, as identified in Section 3.6, would mitigate air quality impacts to less than significant levels. Phase 1's air quality impacts are therefore not cumulatively considerable. No cumulative impacts on air quality would result from implementation of Phase 1. No mitigation measures would be required.

6.3.7 Hazards

The geographic scope for hazards is the Phase 1 site area shown in Figure 2-1. During construction of any of the projects in addition to Phase 1 of the project, there is a risk of uncontrolled release (spill) of fuels and flammable materials. In addition, all projects could result in exposure of workers to contaminated soils during construction.

As described in Section 3.7, the risk of Phase 1 exposing workers and the community to hazardous material incidents is low and would be controlled through regulatory compliance and adherence to EBMUD's Trench Spoils Management procedure. Impacts would be mitigated to less than significant levels. The environmental actions described in documents for the projects listed in Table 6-1 will mitigate potentially significant impacts related to hazards. No cumulative impacts from project hazards would result from implementation of Phase 1. No mitigation measures would be required.

6.3.8 Traffic and Transportation

The geographic scope for traffic and transportation is the Phase 1 site (see Figure 2-1) plus construction access routes to the Phase 1 facilities. All of the projects listed in Table 6-1 and Phase 1 of the Proposed Project would share I-880 as a construction access route. The Wastewater Treatment Plant Capacity Restoration Project would share local construction access through Grant Avenue. Although both of these projects would create traffic and transportation impacts in the project area, the impacts would be temporary, and similar mitigation measures will be implemented by the respective project sponsors. Construction traffic associated with the LAVMWA Project will be confined to the Lewelling Boulevard corridor, and this project will be near completion at the time that Bayside construction is scheduled to begin (Wynne-Jones 2003). No cumulative impacts associated with traffic and transportation would result from implementation of Phase 1, and no additional mitigation measures would be required.

6.3.9 Noise

The geographic scope for noise is the area within 100 feet of the Phase 1 facilities (see Figure 2-1) and access routes. This is the area in which construction and operation noise would be audible. As discussed in Section 3.9, construction of the proposed Phase 1 facilities would temporarily increase ambient noise levels. Phase 1's noise impacts during construction would be mitigated to less than significant levels and would not be cumulatively considerable. Overall, no cumulative noise impacts would result from implementation of Phase 1. No additional mitigation measures would be required.

6.3.10 Public Services and Utilities

The geographic scope for public services and utilities is the construction footprint of Phase 1 facilities plus service areas of applicable public services and utility companies. All projects would create incidental demand for public services, including regional landfill capacity for construction waste. Phase 1's public services and utilities impacts would be minimal, mostly construction related, and would be mitigated to less than significant levels. Because Phase 1 construction would overlap only briefly with the construction periods for the other projects, the risk of simultaneous burdening of public services would be low. No additional mitigation measures would be required.

6.3.11 Cultural Resources

The geographic scope for cultural resources is the construction footprint of Phase 1 facilities. All of the projects listed in Table 6-1 as well as the Phase 1 of the project could result in incremental impacts on cultural resources if construction activities inadvertently impact as-yet-unknown buried cultural resources by disturbing subsurface soils. Such disturbance could result in the loss of integrity of cultural deposits, loss of information, and alteration of a site setting.

As described in Section 3.11, the cultural resources impacts of Phase 1 would be mitigated to less than significant levels and are therefore not cumulatively considerable. Likewise, all of the projects included in Table 6-1 will mitigate potentially significant impacts related to cultural resources to less than significant levels. No cumulative impacts on cultural resources would result from implementation of Phase 1, and no additional mitigation measures would be required.

6.4 References – Cumulative Impacts

Allen, Terry. 2003. Project Manager, Oro Loma Sanitary District. Personal communication. September 25.

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Livermore-Amador Valley Water Management Agency (LAVWMA) 2004. Website www.lavwma.com.

Wynne-Jones, Melissa. 2003. Project Planner, Livermore-Amador Valley Water Management Agency. Personal communication. September 3.

7.0 Analysis of Alternatives

CEQA Guidelines Section 15126.6 requires EIRs to describe and evaluate a range of reasonable alternatives to a project, or to the location of a project, which would feasibly attain most of the basic project objectives and avoid or substantially lessen significant project impacts. The guidelines set forth the following criteria for selecting alternatives:

- "An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project…and evaluate the comparative merits of the alternatives….An EIR is not required to consider alternatives which are infeasible" (CEQA Guideline Section 15126.6[a]).
- "The range of alternatives required in an EIR is governed by a 'rule of reason' that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice" (CEQA Guideline Section 15126.6[f]).
- "… [A]n EIR must identify ways to mitigate or avoid the significant effects that a project may have on the environment…the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly" (CEQA Guideline Section 15126.6[b]).
- "The EIR should briefly describe the rationale for selecting the alternatives to be discussed. The EIR should also identify alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination" (CEQA Guideline Section 15126.6[c]).
- "The specific alternative of 'no project' shall be evaluated along with its impact" (CEQA Guideline Section 15126.6[e][1]).
- "If the environmentally superior alternative is the 'no project' alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives" (CEQA Guideline Section 15126.6[e][2]).

As recommended in CEQA Guidelines Section 15126.6[d], this DEIR includes information about each alternative presented to allow meaningful evaluation, analysis, and comparison with the Proposed Project (Phases 1 and 2).

7.1 Approach to Analysis

Based on the objectives of the Bayside Groundwater Project stated in Section 2.3 of this DEIR and the CEQA Guidelines principles for development of a range of feasible alternatives described above, EBMUD established detailed screening evaluation criteria and applied these criteria to an initial list of 23 alternatives. The screening phase was intended to:

- Identify feasible alternatives (referred to as water supply alternatives) to the project that would achieve the project objectives;
- Review analysis previously conducted by EBMUD on feasible site alternatives that would achieve the project objectives;
- Screen the alternatives using objective screening criteria;
- Develop a range of alternatives for consideration and environmental evaluation in the DEIR pursuant to CEQA requirements; and
- Discuss the alternatives considered but eliminated from detailed study**.**

The Alternatives Analysis was conducted through review of other recent and relevant EBMUD environmental documents and a collaborative workshop between EBMUD planning and engineering staff, CH2M HILL staff, and Orion Environmental Associates. The other EBMUD project reports reviewed included (1) Bayside Groundwater Project Draft EIR, 2001, (2) Freeport Regional Water Project (FRWP) Draft EIR/EIS, 2003, (3) Claremont Corridor Seismic Improvements Draft EIR, 2003, (4) Updated Water Supply Management Program EIR, 1993, (5) Regional Hydrogeologic Investigation, Outer Basins, 2001, and (6) Bayside Groundwater Project Connection Alternatives Evaluation, Draft, June 2003.

Each of these reports was reviewed with particular regard to the project objectives, screening criteria, alternatives considered, and alternatives eliminated. Relevant aspects of this information that pertain to the project were then compiled, synthesized, and edited to form the basis of this Alternatives Analysis and Screening process.

The overall approach to the Alternatives Analysis and Screening process, described below, was conducted on both the water supply alternatives and the site alternatives.

1. *Identify objectives*. The first and most fundamental step was the clear identification of project objectives. The objectives provide the foundation for identifying alternatives, developing detailed evaluation criteria, and determining feasibility.
2. *Compile conceptual alternatives*. The conceptual alternatives were identified from previous studies listed above, public and agency comments on the DEIR, and recent EBMUD projects not previously documented. Conceptual alternatives were compiled for both water supply alternatives and site alternatives and included any project that could conceptually meet most of the project objectives.
3. *Identify screening and fatal flaw criteria*. Screening criteria were developed based on the project objectives and review of criteria used in the previous studies listed above. Criteria are more detailed than the project objectives and were developed to address all aspects of the project, ranging from basic technical reliability and design requirements to environmental, construction, and operational concerns. All criteria were phrased as yes-or-no questions; a "yes" response indicates an advantage, and a "no" response indicates a disadvantage. Separate criteria were developed for water supply alternatives and for site alternatives. From the list of all screening criteria determined to be applicable to this project, a short list of "fatal flaw" criteria were selected as the minimum technical and water supply requirements needed to meet the fundamental project objectives.

4. *Conduct fatal flaw screening*. The fatal flaw criteria were applied to all of the conceptual alternatives to narrow down the list of alternatives. If a conceptual alternative failed to meet any one of the fatal flaw criteria, it was eliminated from further consideration. If an alternative passed all of the fatal flaw criteria, it was retained for further evaluation using the remaining screening criteria.
5. *Conduct detailed alternatives screening.* The remaining screening criteria were then applied to the remaining list of alternatives. Because the criteria were phrased as yes-or-no questions, the responses were assigned a "one" to represent "yes" and a "zero" to represent "no."
6. *Calculate scores for each alternative.* The responses to the screening criteria were summed to calculate a total score for each alternative; a higher number indicated a more favorable alternative. The alternatives could then be compared quantitatively on a consistent, objective basis.
7. *Select alternatives for review in the DEIR.* The alternatives with the highest scores were selected for further study during the environmental review phase of the project. The final selection was then reviewed in context of "a reasonable range of alternatives" that would satisfy the requirements of CEQA.

7.2 Water Supply Alternatives

The subsections below describe the water supply alternatives screening process for the project.

7.2.1 Conceptual Water Supply Alternatives

Water supply alternatives to the Bayside Groundwater Project are projects that could conceptually meet the drought supply objective:

> To reliably provide more water for EBMUD customers during drought periods than would be available from current water supplies alone, thereby reducing the frequency and severity of rationing required of EBMUD customers during a drought period.

This group of alternatives was generally identified and evaluated in the Updated Water Supply Management Program EIR (EDAW 1993), which examined various water supply alternatives under a broader range of objectives that included drought shortages as one of four identified needs for water. From that group, only alternatives that could meet the drought supply objective of the Bayside Groundwater Project were included on the list of conceptual alternatives for this DEIR. In addition, alternatives identified in the Freeport Regional Water Project Draft EIR/EIS (2003) were included on the list for this DEIR because a primary objective of the Freeport project is to provide water supply during droughts. Although the Bayside Groundwater Project objectives are similar to those of the Freeport project, neither project alone meets the entire long-term need for supplemental water supply. Accordingly, these projects complement rather than preclude each other.

Water supply alternatives were grouped into the following main categories: (1) Conservation, (2) Pipe Replacement, (3) Reclamation, (4) Desalination, (5) Groundwater Storage/Conjunctive Use, and (6) New Supply or Water Transfers. Under each category, multiple conceptual alternatives were identified from other EBMUD projects and from comments received on the 2001 DEIR. These conceptual alternatives were first screened for fatal flaws, and then the remaining alternatives were screened using more detailed evaluation criteria, described below.

7.2.1.1 Water Supply Alternatives Screening

Screening criteria for the water supply alternatives used the various categories of project objectives as guidelines. There are two categories of screening criteria: fatal flaw criteria and evaluation criteria. The fatal flaw criteria are considered the most critical criteria and relate to a fundamental project objective; these criteria were used for the first-round screening to narrow the field of possible alternatives. Evaluation criteria were applied for the second-round screening and represent the next level of detail in assessing and comparing alternatives.

The screening criteria were phrased as yes-or-no questions and applied to each alternative. A "yes" response indicates an advantage of the relevant alternative, and a "no" response indicates a disadvantage. In the environmental category, it is assumed that a reasonable level of mitigation would be implemented for any project alternative.

Table 7-1 lists all the water supply screening criteria, with fatal flaw criteria shown in italic, bold-face type. Table 7-2 lists all the conceptual alternatives along with the results of the fatal flaw screening.

Twenty-one conceptual alternatives were identified during the screening process, including the Bayside Groundwater Project. The fatal flaw screening criteria were applied to all of them. If any of the alternatives failed to pass one or more of the fatal flaw screening criteria, that alternative was eliminated from further consideration. Because many of the alternatives are conceptual, the answers to some of the fatal flaw criteria are unknown at this time. An "unknown" response was not considered reason to eliminate an alternative from the first round of screening.

The fatal flaw screening process narrowed the field of alternatives to the following:

- Increased conservation beyond already adopted levels;
- Increased reclamation for local non-potable reuse;
- Bay Area Regional Desalination;
- Groundwater storage in the South East Bay Plain Basin, San Lorenzo (Proposed Project); and
- Groundwater storage in East Contra Costa County.

TABLE 7-1
Water Supply Alternatives Screening Criteria

Category:	Water Supply Alternatives Screening Criteria Under mitigated conditions, would the water supply alternative:
Drought Supply	DS1. *****Augment surface water supplies to meet drought planning rules (including potential rationing) under Year 2020 demands?*****
	DS2. *****Provide a supplemental water supply that would be in place, immediately available and ready for use during droughts?*****
	DS3. Provide substantial portion of 185,000 acre-feet of water supply needed during critical drought years?
Water Quality	*WQ1.* *****Maintain water quality that meets or exceeds existing or proposed health- based drinking water quality standards****?**
Schedule	S1. *****Be constructed and in service in less than five years from certification of the EIR?*****
	S2. Have a flexible implementation schedule and allow phasing?
Legal / Jurisdictional	LJ1. *****Comply with all existing and anticipated water rights permits, license conditions, and all dam and reservoir operating permit conditions, including releases for instream uses and downstream users, and required permits, approvals, agreements, or coordination activities that can be readily obtained and maintained?*****
	LJ2. Require site(s) or resource(s) that are available on a reliable and consistent basis?
	LJ3. Be located within EBMUD service area boundaries?
Reliability	R1. Provide local supply west of the Delta islands?
	R2. Provide local supply west of the Hayward Fault?
Emergency	EM1. Provide a supply available in the event of system outage at Pardee Reservoir or Mokelumne Aqueduct?
Technical	T1. Use proven technology and be technically feasible?
Operational	O1. Be compatible with other supplemental drought supply options under investigation?
	O2. Minimize disruption to existing users?
	O3. Provide operational flexibility, including ability to be responsive to changes in water demand?
Planning	P1. Be consistent with the Water Supply Master Plan, including the Drought Planning Sequence and Drought Management Program?
Environmental	E1. Result in the same or fewer environmental impacts than the Proposed Project?
	E2. Minimize risks to public health and safety?
	E3. Minimize community and traffic disruption during construction and operation?
	E4. Minimize cultural resources impacts during construction and operation?
	E5. Minimize impacts to recreational and open space resources during construction and operation?
	E6. Minimize impacts to biological resources, including wetlands and other sensitive habitats?
	E7. Be located in areas where geologic, hydrologic, and hazard materials impacts are minimal?
Financial	F1. Result in cost-effective charges to EBMUD customers?

** **bold** indicates fatal flaw criteria.

TABLE 7-2
Fatal Flaw Screening of Water Supply Alternatives

Category	Water Supply Alternative	Fatal Flaw Criteria				
		DS1. Augment supplies to meet 2020 demands	**DS2.** Supply can be in place for use during droughts	**WQ1.** Meets all proposed & existing water quality standards	**S1.** Can be imple-mented in less than 5 years	**LJ1.** Complies with permit and license conditions
Conservation	Increased conservation, next increment	Y	Y	Y	Y	Y
Pipe Replacement	Accelerate Pipe Replacement Program	N	N	Y	N	Y
Reclamation	Local Non-potable reuse (8 to 37 mgd)	Y	Unk.	Y	Unk.	Unk.
	Export Reuse B2- Northern San Joaquin County	N	N	N	N/A	N/A
	Export Reuse B5 Pump to Stockton Groundwater Recharge	N	N	N	N/A	N/A
Desalination	EBMUD Delta Desalination	N	N	Y	N	N
	Bay Area Regional Desalination	Y	Y	Y	Unk.	Unk.
Groundwater Storage	San Lorenzo (Bayside Project)	Y	Y	Y	Y	Y
	Walnut Creek/ Concord/Ygnacio/Clayton	N	N	Unk.	N	N
	San Ramon/Castro Valley	N	Unk.	Unk.	Unk.	Unk.
	Richmond	N	N	Unk.	N/A	N
	Berkeley	N	N	Unk.	N/A	N
	Central Valley Region (East Central San Joaquin area)	Y	Y	Y	N	N
	Central Valley Region (South Sacramento County Area)	Y	Y	Y	N	N/A
	East Contra Costa County (Bixler)	Y	Y	Y	Unk.	N/A
	Zone 7	Y	Y	Y	N	N/A
New Supply	Enlarge Pardee Reservoir	Y	Y	Y	N	N
	New Reservoirs	Unk.	Unk.	Unk.	N	N
	PG&E Mokelumne River System Acquisition	Unk.	N	Y	N	N
	Increase capacity of Freeport project	Y	N	Y	N	N
	Water Transfers	Y	Y	N/A	N	N/A

Unk. = Unknown at this time; N/A = not applicable

These alternatives were then examined using the evaluation screening criteria, as shown in Table 7-3. The responses to the evaluation criteria are based on information available to date, comparable or similar projects, and best professional judgment. The responses were converted from “no” and “yes” to “zero” and “one,” respectively, to allow for quantitative comparison. With the exception of desalination, all of the alternatives scored within two points of each other, indicating that, at a screening level, all of the five alternatives listed above achieve the basic project objectives with a comparable level of impacts. Based on this fatal flaw and evaluation screening process, it was determined that all five alternatives, together with the No Project Alternative, should be examined in further detail in the DEIR.

7.2.2 Well Sites Alternatives

In addition to water supply alternatives, alternative locations for the injection/extraction well for Phase 1 of the Bayside Groundwater Project were evaluated. Well site alternatives were identified by field reconnaissance of the project area. A total of 25 potential well sites, including the existing Bayside Well No. 1, were identified. All of the sites considered met the following criteria:

- Have adequate space available for well construction
- Are in the area of greatest well production potential within the EBMUD service area
- Do not require demolition of existing structures

The screening criteria used to compare and rank well site alternatives are as follows:

- Minimize constraints on maintenance access
- Minimize space constraints to construction activities (vertical and horizontal)
- Minimize the disruption to vehicle and pedestrian traffic
- Minimize the need for creek crossings
- Minimize permitting issues
- Minimize temporary disruptions to residences from construction
- Minimize disruptions to residences resulting from operational and maintenance activities
- Minimize temporary disruptions to business from construction
- Minimize disruptions to businesses resulting from operational and maintenance activities
- Minimize disturbances to sensitive habitat and species
- Minimize environmental impacts

Of the 25 well sites considered, four were considered to have potential visual, biological, flooding, and cultural resources impacts. Of the remaining sites, the existing Bayside Well No. 1 was selected because no additional construction would be required for that well and thus construction impacts associated with well drilling would be avoided.

This alternatives analysis does not include an evaluation of alternative facility locations for Phase 2 of the Bayside Project. If EBMUD decides to proceed with Phase 2, a subsequent EIR will be prepared that will include an alternatives analysis for locations for Phase 2 facilities.

TABLE 7-3
Evaluation Screening of Water Supply Alternatives

Evaluation Criteria Under mitigated conditions, would the water supply alternative:	**Conservation**	**Reclamation**	**Regional Desalination**	**Groundwater Storage (San Lorenzo) Proposed Project**	**Groundwater Storage, Bixler**
	(0 = No, 1 = Yes)				
DS3. Provide substantial portion of 185,000 acre-feet of water supply needed during critical drought years?	1	1	1	1	1
S2. Have a flexible implementation schedule and allow phasing?	1	1	1	1	1
LJ2. Require sites or resources that are available on a reliable and consistent basis?	1	0	0	1	1
LJ3. Be located within EBMUD service area boundaries?	1	1	0	1	0
R1. Provide local supply west of the Delta islands?	1	1	1	1	1
R2. Provide a local supply west of the Hayward Fault?	1	1	1	1	0
T1. Use proven technology and be technically feasible?	1	1	1	1	1
O1. Be compatible with other supplemental drought supply options under investigation?	1	1	1	1	1
O2. Minimize disruption to existing users?	0	1	1	1	1
O3. Provide operational flexibility, including ability to be responsive to changes in water demand?	0	0	1	1	1
P1. Be consistent with the Water Supply Master Plan?	1	1	1	1	1
Em.1 Provide a supply available in the event of system outage at Pardee Reservoir or Mokelumne Aqueduct?	1	1	1	1	1
E1. Result in the same or fewer environmental impacts than the proposed project?	1	1	0	1	0
E2. Minimize risks to public health and safety?	1	1	1	1	1
E3. Minimize community and traffic	1	1	0	1	1

TABLE 7-3
Evaluation Screening of Water Supply Alternatives

Evaluation Criteria Under mitigated conditions, would the water supply alternative:	Conservation	Reclamation	Regional Desalination	Groundwater Storage (San Lorenzo) Proposed Project	Groundwater Storage, Bixler
	(0 = No, 1 = Yes)				
disruption during construction and operation?					
E4. Minimize cultural resources impacts during construction and operation?	1	1	1	1	1
E5. Minimize impacts to recreational and open space resources during construction and operation?	1	1	1	1	1
E6. Minimize impacts to biological resources, including wetlands and other sensitive habitats?	1	1	0	1	1
E7. Be located in areas where geologic, hydrologic, and hazard materials impacts are minimal?	1	1	0	1	1
F1. Result in cost-effective charges to EBMUD customers?	0	0	0	1	1
TOTAL	17	17	13	20	17

7.2.3 Alternatives Considered but Eliminated

CEQA Guidelines Section 15126.6 requires that an EIR identify alternatives that were considered by the lead agency but rejected as infeasible during the scoping process. As described in the Water Supply Alternative Screening discussion (Section 7.2.1.1), several water supply alternatives were eliminated from further consideration based on their inability to meet the fatal flaw criteria.

Additionally, several well site locations were eliminated due to the clear environmental benefits of proceeding with the existing Bayside Well No. 1, rather than drilling a new well.

7.3 Project Alternatives

Four alternatives (conservation and reclamation were combined into one), including the No Project Alternative, were selected for detailed study in the DEIR. They are described below, and a summary of their environmental effects compared to those of the Proposed Project is shown in Table 7-4. A more detailed comparison of the environmental effects is shown in Appendix C.

7.3.1 Alternative 1 – No Project Alternative

CEQA Guidelines Section 15126.6(e)(2) requires that the No Project Alternative represent the existing conditions at the time the NOP is published as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services.

Under the No Project Alternative, the Bayside Groundwater Project would not be constructed and, therefore, would not provide supplemental water supply during drought or emergency conditions. If future-year demand projections are realized, and if a multiple-year drought occurs before other sources of supplemental water supply are brought into service, the risk of mandatory water rationing beyond the 25 percent Districtwide goal must be anticipated.

TABLE 7-4
Alternatives Comparison

	Level of Impact Compared to Proposed Project			
Environmental Resource	**Alternative 1 No Project**	**Alternative 2 Conservation and Recycling**	**Alternative 3 Bay Area Regional Desalination**	**Alternative 4 East Contra Costa Groundwater Development**
Groundwater Hydrology and Quality	Less impact	Less impact	No impact	Similar impact
Water Quality, Treatment and Distribution	Less impact	Similar impact	No impact	Similar impact
Surface Water Hydrology and Quality	No impact	Less impact	Unknown	Similar impact
Biological Resources	No impact	Similar impact	Unknown	Similar impact
Geology, Soils and Seismicity	No impact	Similar impact	Similar impact	Similar impact
Air Quality	No impact	Similar impact	Similar impact	Similar impact
Hazards	No impact	Less impact	Less impact	Similar impact
Traffic and Transportation	No impact	Similar impact	Similar impact	Greater impact
Noise	No impact	Similar impact	Similar impact	Similar impact
Public Services and Utilities	Greater impact	Similar impact	Greater impact	Similar impact
Cultural Resources	No impact	Similar impact	Similar impact	Similar impact
Land Use	No impact	Similar impact	Unknown	Greater impact
Visual and Aesthetic Resources	No impact	Similar impact	Similar impact	Similar impact

Under the No Project Alternative, EBMUD would continue to implement projects and programs to achieve targeted levels of water conservation and water recycling, as described in Sections 1.4.2 and 1.4.3 of this DEIR. Attainment of these program goals is already assumed in the demand projections for year 2020 and does not reduce the 25 percent Districtwide rationing standard that could be imposed during a multiple-year drought if no new supplemental water supply were available. Increased levels of conservation and recycling beyond those that are already part of EBMUD water supply management policy are considered under Alternative 2 below in Section 7.3.2.

7.3.1.1 Actions Not Included in the No Project Alternative

Under the No Project Alternative, EBMUD will continue to pursue other supplemental water supplies.

Consistent with CEQA, the No Project Alternative includes reasonably foreseeable projects that have been approved and for which funding has been secured. As a member agency of the Freeport Regional Water Authority, EBMUD is actively working to obtain a 49-mgd average annual dry-year entitlement for supplemental water supply as part of the FRWP. As explained in Section 1.4.6 of this DEIR, the FRWP, if constructed at full capacity, would not meet EBMUD's entire-year 2020 supplemental supply need. Other supplemental water sources would need to be identified and developed. At the time that this DEIR was published, no other supplemental water supply projects that entail construction of major facilities within the EBMUD service area were envisioned. Also consistent with CEQA, the No Project Alternative only includes projects that have undergone environmental review or received project approvals. Projects that have not undergone review are excluded because the review process often results in significant changes to project design and/or operations. Occasionally, as additional information on project feasibility is understood, lead agencies elect not to pursue projects. All of the projects described below require extensive engineering studies, environmental review, and economic evaluation, and these studies have not been initiated. Therefore, these projects are not included in the No Project Alternative although they are included as project alternatives.

- **Bay Area Regional Desalination Projects.** These projects are currently in the preliminary, conceptual planning stage, and project feasibility has not yet been determined. The desalination projects would require further engineering analysis, environmental review, and economic evaluation. This concept is too speculative to be included in the No Project Alternative. However, it is included as an alternative to the No Project Alternative.

- **Increased Recycling.** Implementation of increased recycling would face significant legal, institutional, and regulatory review (EDAW 1993). Increased recycling would also require extensive development of recycled water infrastructure, including treatment and distribution facilities appropriate for recycled water. Conceptual studies are being considered by the District to increase the recycling amounts; however, the specific actions would be difficult to describe at this time without being speculative. However, increased recycling is included as an alternative to the No Project Alternative.

- **Increased Conservation.** To generate further conservation beyond the water savings garnered from EBMUD's conservation efforts from the 1970s through 1994, EBMUD adopted the Water Conservation Master Plan. The goal is to obtain conservation savings above those derived from previous conservation efforts. The District is not currently proposing measures to increase conservation because of the significant costs of such efforts. However, increased conservation is included as an alternative to the No Project Alternative.

7.3.1.2 Consistency with Project Objectives

The No Project Alternative fails to meet any of the project objectives of the Proposed Project:

Objective No. 1, To reliably provide more water for customer use during drought periods than would be available from current water supplies alone. The No Project Alternative would not increase the available supply of water and would require EBMUD to seek such supplies through other means.

Objective No. 2, To make beneficial use of local water resources. The No Project Alternative would not include development of local water resources and thus would not meet this project objective.

Objective No. 3, To provide water that complies with state and federal drinking water standards while maintaining or enhancing basin water quality. Without a project to develop more potable water, this objective would not be applicable to the No Project Alternative.

Objective No. 4, To initiate EBMUD groundwater use within the SEBPB to prepare for both near-term (less than five years) and future drought conditions. The No Project Alternative would delay the availability of a supplemental water supply. The anticipated in-service date for the Bayside Groundwater Project is 2006. The earliest anticipated in-service date for the FRWP is Spring 2008.

7.3.2 Alternative 2 – Increased Conservation and Recycling

EBMUD is not currently planning additional increments of conservation and recycling beyond the year 2020 increments of 34 mgd and 14 mgd, respectively. Increased conservation and recycling are evaluated in this Alternatives Analysis because they would feasibly attain most of the basic project objectives stated in DEIR Section 2.3.

Since the early 1970s, EBMUD and its customers have continued to make important strides in reducing water use and enhancing overall water supply reliability through demand management. Annually, EBMUD examines emerging technologies, changing consumer preferences, conservation synergies, and legislative opportunities to advance water conservation and recycling objectives.

Alternative 2 evaluates the option of increasing conservation and recycling efforts beyond the levels in the District's current conservation and recycling programs.

7.3.2.1 Summary of EBMUD Conservation and Recycling Programs

As detailed in the EBMUD Water Supply Management Plan (WSMP), EBMUD has set aggressive targets to reduce water demand through increased conservation efforts and increased recycling. Table 7-5 below details these targets and the results to date.

TABLE 7-5
Summary of EBMUD Conservation and Recycling Efforts

WSMP Conservation Target (2020)	Conservation Savings to Date	Conservation Savings Still Required (2005-2020)	WSMP Recycling Target	Recycling Water Use to Date	Recycling Savings Still Required (2005-2020)
34 mgd savings	16 mgd	18 mgd	14 mgd savings	8.6 mgd	5.4 mgd

EBMUD has identified and developed a host of programs that will be utilized to meet the 34 mgd in conservation savings anticipated by year 2020. Programs include water use surveys, water saving device distribution, financial incentives, and targeted education and outreach efforts. Additional savings are projected to come from general EBMUD education and outreach efforts, adoption of emerging technologies, and natural replacement of water-using equipment and appliances with high-efficiency models. EBMUD also funds distribution system leak detection (e.g., water waste) as well as meter testing and replacement projects that result in increased conservation. The District has budgeted $30 million for water conservation program funding over the next five fiscal years.

EBMUD has been recycling water for irrigation and in-plant processes at the District's Main Wastewater Treatment Facility since 1971. As stated in the 1993 WSMP, EBMUD recognized that water recycling was an important component of the District's water supply, and hence included recycled water as a key element in the supply portfolio. Today, the goal of the program continues to be the planning, development and implementation of recycled water projects throughout EBMUD's service area to reduce the demand on EBMUD's drinking water supplies.

In fiscal year 2004, the District spent approximately $14.8 million on the water recycling program. Of this, $12.4 million was spent on implementing capital projects, with the remaining used to cover program operating expenses. Also in fiscal year 2004, the District increased the incentives offered to customers to use recycled water in place of potable water via the adoption of a new non-potable water rate structure meant to offer cost savings opportunities, a discount of approximately 20 percent from the potable water rate.

As described in Section 1.0, the projected water demands through year 2020 for the EBMUD service area include implementation of conservation (34 mgd) and recycling (14 mgd). This level of conservation and recycling already represents a significant investment by the District and its customers. The District could recycle, however, an additional 8 mgd through satellite recycled water treatment plants. Satellite recycled water treatment plants take raw sewage from a wastewater collection pipelines and treat it to a tertiary level. This can be an effective way to serve remotely located medium to large water users because satellite plants avoid infrastructure cost required to transport water from the source to remotely located customers. The District is conducting a study to: 1) determine the most cost-effective recycled water treatment method to use for a satellite plant and 2) identify customers to receive recycled water from such a facility. Among the potential customers under consideration are Mountain View Cemetery, Sequoyah Country Club, and the University of California at Berkeley. Development of satellite recycled water treatment plants must consider the siting, construction, and operation of wastewater treatment plants within the community and may not be feasible in every location. Facility siting and environmental review for such plants could take several years.

EBMUD customers could conserve an additional 5.4 mgd by intensifying the District's existing conservation program. Alternative 2 would implement additional water conservation and recycling programs beyond those currently planned. If effective, an expanded conservation program would conserve an additional 5.4 mgd.

Costs to implement expanded conservation beyond the current EBMUD program would be over 50 percent greater per unit of capacity than the cost of the Proposed Project (EBMUD 2003, 2004). Expanded recycling costs are estimated to be higher than expanded conservation costs. In addition to cost, the following concerns with expanded conservation and recycling programs were identified in the WSMP:

- **Residential conservation savings offer the most room for improvement, yet are the most problematic to implement**. Most water districts in California (including EBMUD) have identified that there is a much greater potential for residential customers (as opposed to industrial customers) to reduce their water use. However, water savings from conservation, especially those that rely on customer behavioral changes, are expected to diminish or "depreciate" over time. EBMUD recommendations may have only a temporary influence on customer behavior, and savings from hardware changes may degrade due to product wear.

- **Public opposition to construction of a residential recycled water system (as needed to achieve expanded program goals).** While the public's negative reaction to the use of recycled water for residential irrigation can be overcome through education, public acceptance of major construction disruptions caused by extensive retrofitting of residential areas can create significant problems and build significant local opposition to particular project proposals.

- **Water quality impacts of recycled water on existing plantings/vegetation**. The public has expressed concerns regarding the impacts of reclaimed water use on salt sensitive plants and the possible need to revise vegetation or plantings to address such impacts. EBMUD would need to consider any negative impacts and plan corresponding mitigation measures.

- **Demand shifts over time impact the level of increased savings**. In future years, the District anticipates that demand patterns will shift, in that the split between interior and exterior water use will move from the 60/40 percent as measured in 1994 toward a 50/50 percent by 2020 due to continued introduction of interior water saving mechanisms (e.g., low-flush toilets, etc.). While this will help to reduce residential water use overall in accordance with the District's existing conversations plans, it leaves less "slack" available for implementing drought management plans which rely to a large extent on personal habit changes.

- **Early conservation and recycling efforts result in greatest savings; however, similar increased savings over time become more difficult**. As conservation measures increase over time, the District has found that the ability to achieve a similar level and/or percentage of reduction by increased measures is unlikely even with significant increases in costs to develop such measures.

7.3.2.2 Consistency with Project Objectives

Alternative 2 meets three of the Proposed Project objectives:

Objective No. 1, To reliably provide more water for customer use during drought periods than would be available from current water supplies alone. At full implementation, Alternative 2 would increase the availability of existing source water during drought periods.

Objective No. 2, To make beneficial use of local water resources. By reducing local water demands, Alternative 2 would effectively satisfy this requirement.

Objective No. 3, To provide water that complies with state and federal drinking water standards while maintaining or enhancing basin water quality. Alternative 2 would meet this requirement because the conserved water would be from EBMUD's current sources (Mokelumne River and local runoff).

Objective No. 4, To initiate EBMUD groundwater use within the SEBPB to prepare for both near-term (less than five years) and future drought conditions. Alternative 2 would require additional studies, construction of public and private improvements, and coordination with customers. Some of these activities may require a long implementation schedule and would not be in place ahead of the next multiple-year drought.

7.3.3 Alternative 3 – Bay Area Regional Desalination

EBMUD, SFPUC, the Contra Costa Water District, and the Santa Clara Valley Water District are jointly exploring the development of regional desalination facilities. Bay Area Regional Desalination would consist of one or more treatment plants to remove salt from seawater or other brackish water sources, likely built in increments of 20 mgd or less, with a maximum capacity of 120 mgd of potable water by 2008. The facilities would provide the following:

- Additional source(s) of water for the residents and businesses served by all four participating agencies during emergencies;
- An alternative water supply that would allow major facilities to be taken out of service for an extended time for inspection, maintenance, or repairs; and
- A supplemental supply during drought periods (URS Corporation 2003).

The likely water treatment process would be reverse osmosis, which desalts marine water using thin, pliable membranes. Salts are concentrated in a brine solution that must be treated or diluted and then returned to the ocean in compliance with regulations.

7.3.3.1 Desalination Site Evaluation

The participating agencies have identified 13 possible desalination facility sites (see Figure 7-1). The Pittsburg Mirant Power Plant site ranked No. 1 (tied with another Mirant site), the Oceanside site ranked No. 2, and the Near Bay Bridge site ranked No. 3. Depending on the size and location of the facilities, additional pipelines and pumps will be necessary to transport the desalinated water to each agency's service area. The opportunities and constraints associated with constructing a desalination facility at each site are summarized below (URS Corporation 2003):

- **Mirant Pittsburg Plant Site.** Advantages include existing intake and outfall structures, high-quality source water, economical energy source, and proximity to Contra Costa Water District and EBMUD transmission facilities. Because the Mirant Pittsburg Plant is located on the Delta, however, permitting the desalination plant may present greater challenges than at the Near Bay Bridge or Oceanside sites. Water rights for consumptive use of the source water would be required. In addition, standards for discharge into the Delta are more stringent than those for the bay or ocean.
- **Oceanside.** An existing outfall structure at the site has ample capacity to accommodate a desalination plant. Because the outfall is in the ocean, concentrate discharged through the outfall would have greater dispersion than concentrate discharged into the bay. As such, concentrate disposal in the ocean may be easier to permit than concentrate disposal in the bay or delta. The source water at this location would have the highest salinity of water from any of the three sites. As with the Near Bay Bridge site, a desalination plant at the Oceanside site would be able to directly connect to only one of the participating agencies' transmission systems. Other agencies would realize benefits through transfers.
- **Near Bay Bridge.** Advantages include the existing outfall structure and proximity to EBMUD transmission facilities. Constructing and operating a desalination plant at this site would be more costly than at the Mirant Pittsburg Plant site because an intake structure would need to be built, the water quality is not as good, and energy would be more costly. A desalination plant at this site would only be able to connect directly to EBMUD's transmission system. Benefits to other agencies could be achieved through transfers. However, none of the permitting issues associated with the Delta would be as difficult at this site.

Detailed studies on each potential site may not be completed for several years, given the project's size and complexity. The viability of implementing the Bay Area Regional Desalination Project will depend on the commitment of each agency's board members, concerns of the agencies' customers, and the availability of agency management and staff (URS Corporation 2003).

Implementation of Bay Area Regional Desalination Project would require a lengthy public review process because of the number of agencies that would be involved with discretionary permit review and the as-yet unidentified concerns of the affected public. Desalination is not reasonably expected to occur before 2010. It is evaluated in this alternatives analysis, however, because it feasibly attains most of the project objectives.

In addition to the three top ranked sites from the regional study, EBMUD is looking at the location near the C&H sugar refinery in Crockett as a possible desalination site. The project would produce 1.5 mgd of potable water from the Carquinez Strait to offset C&H's current use of water from the distribution system for its industrial processes. The project would help EBMUD and other agencies learn from the experience of operating a desalination facility in the challenging Bay-Delta Estuary environment while producing water to improve reliability for EBMUD customers. C&H currently uses up to 2.3 mgd of potable

Source: *TOPO!, National Geographic Maps, 1998.*

NO.	SITE	NO.	SITE
1	C&H Sugar Refinery, Crocket	8	Oceanside, San Francisco
2	Mirant Contra Costa Plant, Antioch	9	BDPL 1&2 at Dumbarton Point
3	Mirant Pittsburg Plant, Pittsburg	10	Near Bay Bridge
4	Palo Alto Water Pollution Control Plant Site	11	Mallard Slough
5	Pico Power Plant Site, Santa Clara	12	San Francisco Airport
6	Los Esteros Power Plant Site, San Jose	13	Barge-Mounted Plant
7	Treasure Island Site, San Francisco		

FIGURE 7-1
BAY AREA DESALINATION STUDY SITES
EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
RECIRCULATED DRAFT EIR

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water from EBMUD, a portion of which would be offset by desalted water freeing up EBMUD potable supplies for other customers. The desalted water, after being used for industrial processes, would be discharged back into the Carquinez Strait via the onsite wastewater treatment plant. The power required for operating the desalination facilities would be acquired from the Crockett cogeneration facility, C&H's turbo generator, steam turbines, or PG&E. C&H Sugar and EBMUD are in the early stages of discussions as to their mutual interest to proceed. The uncertainty of partnership discussions and project permitting suggest that completion of the project in less than 5 years is unlikely.

7.3.3.2 Consistency with Project Objectives

Alternative 3 would meet three of the four objectives of the Proposed Project:

Objective No. 1, To reliably provide more water for customer use during drought periods than would be available from current water supplies alone. At full implementation, Alternative 3 would increase the availability of existing source water during drought periods.

Objective No. 2, To make beneficial use of local water resources. Alternative 3 would include development of local water resources (bay water) and thus would meet this project objective.

Objective No. 3, To provide water that complies with state and federal drinking water standards while maintaining or enhancing basin water quality. It can be assumed that any desalination facility would be required to meet all state and federal drinking water requirements. Therefore Alternative 3 would meet this objective.

Objective No. 4, To initiate EBMUD groundwater use within the SEBPB to prepare for both near-term (less than five years) and future drought conditions. Alternative 3 would likely require a very lengthy implementation schedule to address siting, brine discharge, and other environmental issues. It is anticipated, therefore, that Alternative 3 would not provide a supplemental supply in the near term.

7.3.4 Alternative 4 – East Contra Costa County Groundwater Development

This alternative considers locating a conjunctive-use project, similar to the Bayside Groundwater Project, on EBMUD's Bixler property, a 303-acre site located approximately 3.5 miles east of Brentwood in east Contra Costa County (see Figure 7-2). During the past two years, EBMUD has conducted three phases of hydrogeological exploration to assess the feasibility of developing a supplemental groundwater supply at the Bixler site (Fugro West, Inc. 2002). The purpose of the hydrogeological investigation was to determine whether the aquifer underlying the Bixler property could provide a supplemental water supply for dry years. The study included the following elements:

- Hydrogeologic characterization and water balance;
- Installation of one production well and ten monitoring wells and performance of a three-day aquifer test;
- Construction and calibration of steady-state and transient numerical (MODFLOW) groundwater models;
- Local well inventory; and

- Preliminary subsidence evaluation (Fugro West, Inc. 2003).

The hydrogeological study results indicate that a 10-mgd dry-year groundwater project with a 1.5-mgd injection component in wet years is feasible at this location. See the District's fact sheet on the investigation for further details at http://www.ebmud.com (EBMUD 2002).

Agreements with local partners and groundwater users would be needed to further develop this alternative. To date, attempts to develop such agreements have been unsuccessful.

7.3.4.1 Consistency with Project Objectives

Alternative 4 would meet three of the four Proposed Project objectives.

Objective No. 1, To reliably provide more water for customer use during drought periods than would be available from current water supplies alone. At full implementation, Alternative 4 would provide more water during drought periods.

Objective No. 2, To make beneficial use of local water resources. Alternative 4 would include development of local water resources and thus would meet this project objective.

Objective No. 3, To provide water that complies with state and federal drinking water standards while maintaining or enhancing basin water quality. Alternative 4 would meet this requirement.

Objective No. 4, To initiate EBMUD groundwater use within the SEBPB to prepare for both near-term (less than five years) and future drought conditions. Alternative 4 would require a lengthy implementation schedule to secure the required agreements for implementation and therefore would not meet this objective.

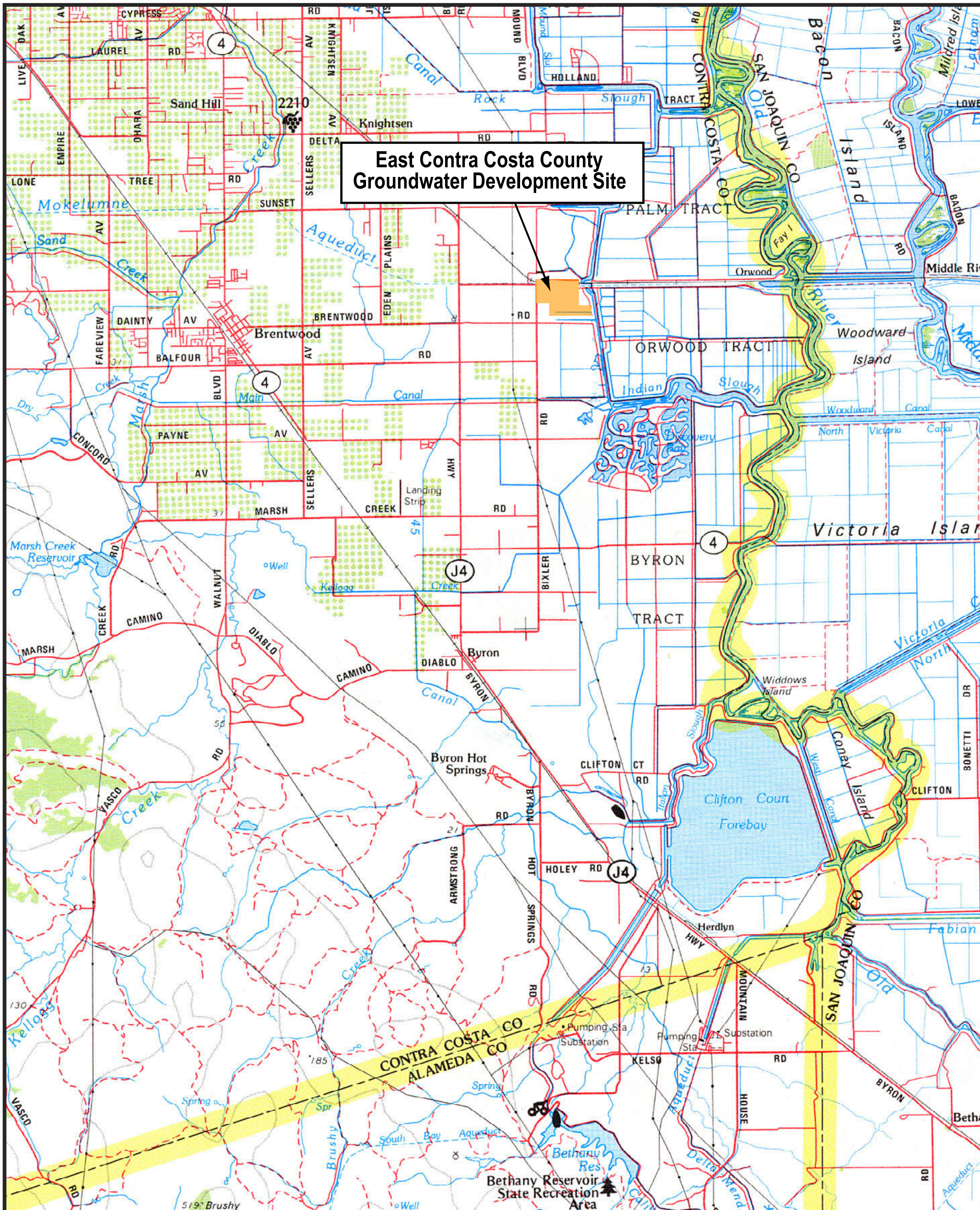
7.4 Alternatives Comparison

Table 7-4 summarizes the comparison of environmental impacts of the alternatives to the Proposed Project. A more detailed comparison of alternatives and project effects is shown in Appendix C. The information in the table and appendix is based on limited detail about each alternative. None of the alternatives is currently a specific project developed to a level of detail that would permit determination of precise impacts. Therefore, impacts and mitigation measures listed under each alternative in Appendix C are based on the professional judgment of the authors of this DEIR and their experience with similar projects in other geographic areas. The table and appendix discloses instances in which impacts are too speculative to reasonably predict.

Conclusions in this section are based on the alternatives' ability to avoid or substantially reduce key significant impacts. These conclusions consider whether reasonable mitigation measures could reduce an alternative's significant impacts to less than significant levels. Mitigated alternatives are then compared to the impacts after implementation of the mitigation measures described in Section 3 and Section 4 of this DEIR.

7.4.1 Impact Conclusions

The No Project Alternative would not meet the need for the project, nor would it satisfy all of the project objectives. As described in Table 7-4 and Appendix C, the No Project



Source: Northern California Atlas & Gazetteer, 1988.

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FIGURE 7-2
LOCATION OF EAST CONTRA COSTA COUNTY GROUNDWATER PROJECT
EAST BAY MUNICIPAL UTILITY DISTRICT
BAYSIDE GROUNDWATER PROJECT
RECIRCULATED DRAFT EIR

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169710.26.ZZ_Fig 7-2 Location of East CC County_2/23/05_ccc_sfo

Alternative would result in fewer overall environmental impacts than the Proposed Project in most environmental resource categories. An exception is Public Services and Utilities impacts, where severe water rationing would impact the ability of service providers and utilities to meet customer demand.

Under Alternative 2, recycling and conservation activities would provide a water supply during drought period but would not satisfy the additional project objectives of developing a local water supply or being completed in the near term, as described in Section 7.2. Impacts resulting from implementation of Alternative 2 are generally dependent on the site selection for reclamation facilities but would likely result in impacts similar to those of the project, with the exception of impacts for Groundwater Hydrology and Quality; Surface Water Hydrology and Quality; and Hazards.

Alternative 3, Desalination, meets the objectives for developing a supplemental water supply and a local water resource and meets water quality objectives; however, this alternative is not implementable in the near term. Biological Resources and Surface Water Hydrology and Quality impacts resulting from Alternative 3 are unknown and could be greater or less than those of the project, depending on whether an acceptable brine solution disposal option is developed in conjunction with the RWQCB. In addition, as stated in Appendix C, desalination would require a substantial amount of energy. It is anticipated that this energy requirement would be greater than that of the project.

Alternative 4, East Contra Costa Groundwater Development, would meet the need for a supplemental water supply, would develop a local resource, and would meet water quality objectives, but it is unlikely to be accomplished in the near term because of the institutional complexity of the project. Implementation of Alternative 4 would likely result in similar impacts as those of the Proposed Project, except for Traffic and Transportation and Land Use impacts, which may be greater than for the project.

7.4.2 Environmentally Superior Alternative

CEQA Guidelines Section 15126.6(e)2 states "If the environmentally superior alternative is the No Project Alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives." For this project, Alternative 1, the No Project Alternative, is environmentally superior to the other alternatives for the reasons stated above in Section 7.3.1; therefore, the next environmentally superior alternative is discussed below.

Conservation and Recycling would likely avoid or incur fewer environmental impacts than the Proposed Project and the other alternatives. Alternative 2 is, therefore, the environmentally superior alternative. However, because Alternative 2 could not be implemented in the near term and because of the implementation concerns described in Section 7.3.2.1, EBMUD is proceeding with Phase 1 of the project.

7.5 References – Analysis of Alternatives

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9.0 List of Acronyms and Abbreviations

μg/kg	micrograms per kilogram
μg/m^3	micrograms per cubic meter
μg/L	micrograms per liter
μmhos/cm	micromhos per centimeter
ABAG	Association of Bay Area Governments
ACCMA	Alameda County Congestion Management Agency
ACCWP	Alameda Countywide Clean Water Program
ACEHS	Alameda County Environmental Health Services
ACFCD	Alameda County Flood Control Water Conservation District
AC Transit	Alameda County Transit
ACWD	Alameda County Water District
AF	acre-feet
AHF	above Hayward fault
ASR	aquifer storage and recovery
AST	aboveground storage tank
ASTM	American Society of Testing Materials
BAAB	Bay Area Air Basin
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
BCDC	Bay Conservation and Development Commission
bgs	below ground surface
BHF	below Hayward fault
BMPs	Best Management Practices
CalARP	California Accidental Release Program
CalEPA	California Environmental Protection Agency
CalOSHA	California Occupational Health and Safety Administration

CAP	Clean Air Plan
CARB	California Air Resources Board
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CHMIRS	California Hazardous Materials Incident Reporting System
CHRIS/ NWIC	California Historical Resources Information System, Northwest Information Center
CMP	Congestion Management Program
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide
CONC	concentration
CPUC	California Public Utilities Commission
CRHR	California Register of Historic Resources
CSU	California State University
CUPA	Certified Unified Program Agency
CVP	Central Valley Project
CWA	Clean Water Act
DBP	disinfection by-product
dB	decibel
dBA	A-weighted decibels
DDBR	Disinfectant/Disinfection By-Product Rule
DEIR	Draft Environmental Impact Report
DDT	dichlorodiphenyltrichloroethane
DHS	Department of Health Services

District, the	East Bay Municipal Utility District
DOC	dissolved organic carbon
DOD	U.S. Department of Defense
DOT	U.S. Department of Transportation
DTSC	California Environmental Protection Agency Department of Toxic Substances Control
DWR	California Department of Water Resources
DWSAP	Drinking Water Source Assessment and Protection
EBMUD	East Bay Municipal Utility District
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ERNS	Emergency Response Notification System
ESA	Environmental Science Associates
FE	federal—endangered (species)
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FESA	Federal Endangered Species Act
FID	Facility Inventory Database
FINDS	Facility Index System
FRWP	Freeport Regional Water Project
FSC	federal—species of concern
FT	federal—threatened (species)
GW	groundwater
GWR	Ground Water Rule
HAZNET	Hazardous Waste Information System
HMBP	hazardous materials business plan
Hp	horsepower ratings
HRA	Health Risk Assessment
I-580	Interstate 580
I-680	Interstate 680

I-880	Interstate 880
I-80	Interstate 80
IWMB	Integrated Waste Management Board
JSA	Joint Settlement Agreement
K	pump constant
LAVWMA	Livermore-Amador Valley Water Management Agency
L_{dn}	day-night noise level
L_{eq}	energy equivalent noise level (or "average" noise level)
LMRMP	Lower Mokelumne River Management Plan
LOS	level of service
LUST	leaking underground storage tanks
M	maximum moment magnitude earthquake
MCL	maximum contaminant level
MCLG	maximum contaminant level goal
mf/L	million fibers per liter
mg/kg	milligrams per kilogram
mgd	million gallons per day
mg/L	milligrams per liter
MMI	Modified Mercalli Intensity Scale
MMRP	Mitigation Monitoring and Reporting Program
msl	mean sea level
MTBE	methyl tertiary-butyl ether
MTC	Metropolitan Transportation Commission
N/A	not applicable
NA	not available
NAAQS	National Ambient Air Quality Standards
NCGWB	Niles Cone Ground Water Basin
NEBIGSM	Niles Cone and South East Bay Plain Integrated Groundwater and Surface Water Model
NM	not measured

NO_2	nitrogen dioxide
NOP	Notice of Preparation
No_x	nitrogen oxide
NPDES	National Pollutant Elimination Discharge System
NRC	Nuclear Regulatory Commission
NRHP	National Register of Historic Places
NS	no standard
NTU	Nephelometric Turbidity Unit
O_3	ozone
OES	Office of Emergency Services
OLSD	Oro Loma Sanitary District
Pb	lead
PCA	possible contaminating activities
PCBs	polychlorinated biphenyls
pCi/L	picocuries of radiation per liter of air
PG&E	Pacific Gas and Electric
PHG	Public Health Goal
PM_{10}	inhalable particulate matter
$PM_{2.5}$	Fraction of PM_{10} that is 2.5 microns or less
ppb	parts per billion
ppm	parts per million
Proposed Project	Bayside Groundwater Project
psig	per square inch gauge
PZ	pressure zone
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery Act Information System
RDEIR	Recirculated Draft Environmental Impact Report
Reclamation	U.S. Bureau of Reclamation

RMP	Regional Monitoring Program
RMPP	Risk Management and Prevention Plan
ROD	record of decision
ROG	reactive organic gases
rpm	revolutions per minute
RPZ	root protection zone
RWQCB	Regional Water Quality Control Board
SAAQS	State Ambient Air Quality Standards
SCWA	Sacramento County Water Agency
SE	state—endangered (species)
SEBP	South East Bay Plain
SFPUC	San Francisco Public Utility Commission
SLIC Reg2	Spills, Leaks, Investigation, and Cleanup Cost Recovery Listing
SO_2	sulfur dioxide
SO_x	sulfur oxide
SQG	small quantity generator
ST	state—threatened (species)
SWF/LF	Solid Waste Information System
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
TAF	thousand acre-feet
TDS	total dissolved solids
THM	trihalomethane
TMDL	total maximum daily loads
UBC	Uniform Building Code
UFC	Uniform Fire Code
UPRR	Union Pacific Railroad
USACE	U.S. Army Corps of Engineers

USB	Ultimate Service Boundary
U.S. EPA	U.S. Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	U.S. Geological Survey
USL	Upper San Leandro Reservoir
USLWTP	Upper San Leandro Water Treatment Plant
UST	underground storage tank
UWMP	Urban Water Management Plan
WCMP	Water Conservation Master Plan
WDS	waste discharge system
WSMP	Water Supply Management Plan/Program
WTP	water treatment plant

Appendix A
Notice of Preparation and Scoping Documentation

NOTICE OF PREPARATION (NOP)
ENVIRONMENTAL IMPACT REPORT (EIR)
for the
BAYSIDE GROUNDWATER PROJECT

To Responsible Agencies

East Bay Municipal Utility District (EBMUD or District), as lead agency, is preparing an EIR for the Bayside Groundwater Project (project). We invite your comments on the scope and content of the environmental information to be presented in connection with the proposed project. In accordance with CEQA Guidelines Section 15082(b), your response is requested at the earliest possible date, but not later than 30 days after receipt of this NOP.

Background and Need for the Project

In October 1993, EBMUD adopted the Water Supply Management Program (WSMP) that serves as a planning guide for the provision of water to the EBMUD service area through year 2020. The WSMP demonstrated that EBMUD's existing water supplies are insufficient to meet current and future customer demand during droughts, despite implementation of significant water conservation and water reclamation programs and an aggressive dry-year water rationing policy. Without additional near-term water supplies, EBMUD customers will experience potentially severe water shortages during prolonged droughts.

In 1997, EBMUD drilled a demonstration well to investigate the feasibility of utilizing deep aquifers in the South East Bay Plain Basin (SEBPB) for groundwater storage and recovery. The demonstration well was installed on site at the Oro Loma Sanitary District (OLSD) Wastewater Treatment Plant at 2600 Grant Avenue in San Lorenzo. It was drilled to a depth of 665 feet. Studies of the demonstration well's operation verified that potable water can be injected successfully into the deep aquifer and later recovered, and that the aquifer would provide sufficient yield to meet a portion of the expanded supply needed in future drought events.

In March 2001, EBMUD circulated a Draft EIR (SCH #2000092044) that evaluated development of a multiple-well project in the San Lorenzo area with a capacity of 15 million gallons per day (MGD). EBMUD received extensive comments on that EIR, which it carefully reviewed and considered. It then conducted additional studies of groundwater basin impacts, potential subsidence in the EBMUD service area related to pumping, and water quality. EBMUD also worked closely with other agencies to examine the potential effects of Bayside Project operation on groundwater resources in communities outside of its service area. As a result of its review of comments on the 2001 Draft EIR and its subsequent analysis of groundwater issues, EBMUD has substantially revised the project. The Draft EIR on the original 2001 project was never finalized.

This NOP is for a new EIR that will analyze the revised project. Proposed content of the new EIR is described in Attachment One of this NOP.

The Bayside Groundwater Project to be analyzed in the new EIR consists of two phases, a (1) Phase I initial 1 MGD average annual capacity project involving the existing demonstration well adapted to permanent injection/extraction use along with minor new facilities in the San Lorenzo area, and (2) a Phase II potential future expansion of groundwater facilities up to 10 MGD capacity. The project is more fully summarized below under "Project Description."

Project Objectives

The District's overall objectives for the Bayside Groundwater Project are the following:

- To reliably provide more water for customer use during drought periods than would be available through current water supplies alone.
- To make beneficial use of local water resources.
- To provide water that complies with state and federal drinking water requirements, and to maintain and enhance basin water quality.

In addition to the overall objectives, Phase 1 of the project carries the following additional objectives:

- To initiate EBMUD groundwater use within the SEBPB to prepare for both near-term and future drought conditions.
- To collect data to inform decision-making regarding (1) whether it is appropriate to proceed with a Phase II larger-capacity facility and, if so, (2) how to design it.

Project Description

Phase I - Initial 1 MGD average annual capacity project consisting of one groundwater well and associated facilities in the San Lorenzo area.

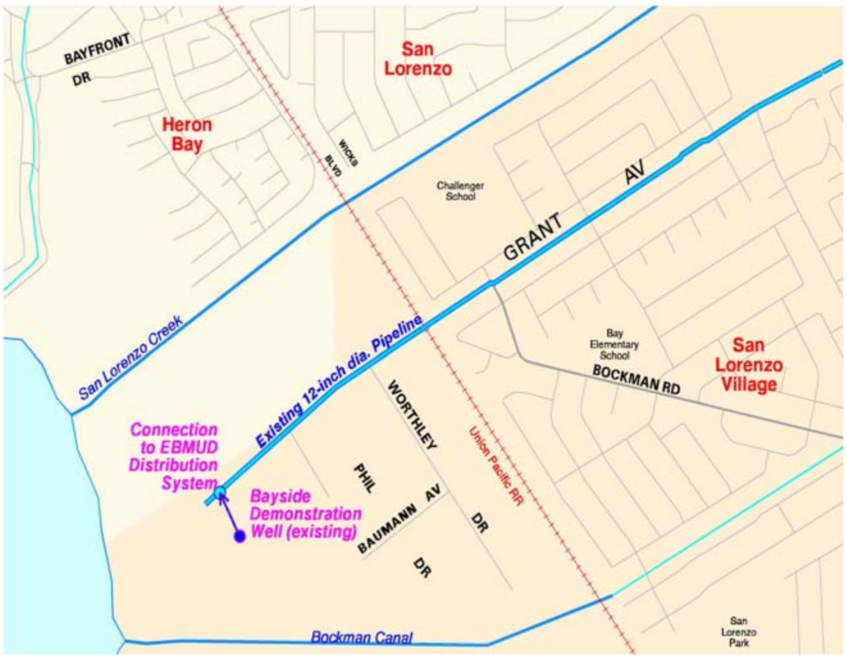
Phase II - Potential future expansion of groundwater facilities up to 10 MGD in size. If it is pursued in the future, the Phase II facilities may be located in the same general San Lorenzo area as Phase I is proposed to be located, and/or in a broader geographic area including venues within San Leandro, San Lorenzo, and/or Oakland.

The new Bayside Groundwater Project EIR will focus on Phase I, which is the immediate project EBMUD proposes to build and operate. At this time EBMUD does not know whether it will pursue Phase II, or, if it does pursue it, exactly what Phase II facilities will be necessary; where those facilities will be located; or what the ultimate size of those future facilities will be, other than somewhere in the range of 2-10 MGD average annual capacity. EBMUD plans to use information gained from actual operation of Phase I to help inform its future determinations on whether and how to proceed with Phase II.

Therefore, although the EIR will contain some discussion of the potential Phase II impacts, in depth discussion will be deferred until EBMUD proposes what, if any, Phase II facilities should be constructed and where. If and when EBMUD does propose Phase II facilities in the future, EBMUD will then complete detailed CEQA documentation on those facilities. This approach is in accordance with CEQA Guidelines Section 15165.

Phase I Facilities

EBMUD proposes to develop a single well project, using the existing demonstration well, with an annual average yield of 1 MGD, to be operated for a portion of drought years at a maximum 2 MGD extraction rate. The facilities required for Phase I are described below and would be located within the unincorporated area of Alameda County known as San Lorenzo as shown on the following map.



(Existing) Demonstration Well. Under Phase I, EBMUD will prepare the existing demonstration well described above for use as a permanent injection/extraction well. Access to the well would be from Grant Avenue through the OLSD treatment plant.

Well Head Treatment Facility. A small structure near the well head is proposed to be constructed to enclose wellhead treatment equipment. This wellhead treatment facility, if needed, will filter manganese and iron to ensure that the concentrations of these minerals meet drinking water standards. Well head treatment may also include fluoridation and chloramination, if necessary to meet standards. If manganese and iron filtration is required, backwash tanks will be required to contain water used to clean and maintain the manganese/iron removal filter system. The effluent would be released to the existing storm drain and sanitary sewer systems in accordance with any necessary discharge permits.

Inlet-Outlet Line. A short pipeline will convey recovered, treated groundwater to the existing 12-inch diameter distribution main in Grant Avenue, and allow treated surface water to flow to the well during injection operations. Phase I will not require a new transmission pipeline along Grant Avenue.

Although the well and well head treatment facilities are minimally visible to the westerly terminus of Grant Avenue, EBMUD will landscape the site and provide fencing and security lighting.

Extensometer and Monitoring Well System. A key component of Phase I will be extensive monitoring programs to measure changes in water levels, water quality, and ground level elevations (subsidence). A deep precision-drilled extensometer with instrumentation below ground at various levels, will be installed on EBMUD lands just east of the Phase I well to measure ground movement. EBMUD will use the network of small-diameter monitoring wells already in the Phase I project area and the extensometer to collect water level and ground surface elevation data to during Phase I operation to verify subsidence properties. Water level monitoring will result in information on groundwater basin effects in order to aid groundwater modeling and management efforts with other water agencies and to help inform EBMUD's future determinations on whether and how to proceed with Phase II.

Phase I Operations

Startup Testing: EBMUD will operate Phase I of the project for up to one year after completion, irrespective of the occurrence of drought conditions in the service area. This will be done to ensure the facilities operate as planned, and to gather additional data from water quality samples and water level measurements in the deep and shallow levels of both the South East Bay Plain Basin and the Niles Cone Groundwater Basins. That data will assist EBMUD in making its future determinations on whether and how to proceed with Phase II

Initially, extracted groundwater will be pumped to storm drains while the water quality of the extracted water is tested and the appropriate type of well-head treatment is brought on line. Once the treatment is in place, the extracted water will be available for use during the test period as needed for a drought supply. If the test occurs under non-drought conditions, the water will continue to be pumped to the storm drains.

Sustained Operation: Historical hydrology suggests that when the sustained operation period begins, surface water from local watershed runoff would be available for injection approximately 40 percent of the time. During wet years, EBMUD will inject treated surface water from its distribution system at a rate of up to 1 MGD for that portion of the water year that surplus water is available. During dry years, EBMUD will recover both injected surface water and native groundwater by operating the well in extraction mode during warm-weather months. The pumps will be operated at a 2 MGD extraction rate during this part-year period to maximize warm-weather yield and well efficiency, but Phase I yield will be capped at an average annual yield of 1 MGD. As will be the case with startup operation, sustained operation will continue to include regular collection and evaluation of monitoring data for both injection and extraction operations.

Monitoring: Water quality, subsidence, and water level measurements will be collected as project operations proceed. In this manner, the extensometer system described above and associated water-level monitoring wells will serve an important role in determining the feasibility of the potential future Phase II project. In addition, water level monitoring during operation will lead to improved accuracy and reliability of the groundwater model that EBMUD and other water agencies use to predict potential water level and ground surface elevation changes of the potential future Phase II project.

Phase I Construction

Although the major facility for Phase I, the demonstration well to be used as a permanent injection/extraction well, has already been developed, about six months would be required to complete site preparation, well-rehabilitation and installation of a new 12 inch diameter pipeline connection from the well site to the existing 12 inch diameter distribution line in Grant Avenue. The extensometer would also be developed during this period on a portion of EBMUD lands northeast of the well site.

Lead Agency Action on the Final EIR and Project Approval

Certification of the Final EIR and project approval by the EBMUD Board of Directors will be for the Phase I only. The Phase II potential future expansion would not be approved at that time, and would not be approved until after EBMUD prepares appropriate subsequent CEQA documentation on Phase II facilities.

DEIR Schedule

EBMUD has scheduled release of the DEIR for circulation in January 2005. The DEIR will be available for review and comment for 45 days after its publication. The document will be made available in printed form, on CD-ROMs and in a full text version on the EBMUD website. Outreach activities, including meetings of the Bayside Project Community Liaison Group, are planned throughout the development and operation of the Phase I project.

Comments on the NOP should be sent to:

Ms. Angela Knight
East Bay Municipal Utility District MS 407
PO Box 24055
Oakland, CA 94623-1055
Or transmitted by email to: aknight@ebmud.com

Date Issued: 10-21-2004

Signature: Jon A. Myers
Jon A. Myers
Acting Director, Water & Natural Resources

ATTACHMENT ONE

ENVIRONMENTAL RESOURCES POTENTIALLY AFFECTED

The environmental factors checked below may be subject to potentially significant impacts as a result of the Bayside Groundwater Project.

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

DETERMINATION

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☒ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

Jon A. Myers 10·21·2004

Signature Date

Jon A. Myers, Acting Director, Water & Natural Resources

TOPICS TO BE ADDRESSED
IN THE BAYSIDE GROUNDWATER PROJECT
ENVIRONMENTAL IMPACT REPORT

Aesthetics

Phase I: There will be no aesthetic impacts because the wellhead facilities will be on an already developed plant site and will be screened by existing buildings. Nevertheless, ebmud will further improve the area by landscaping the site and providing security lighting.

Phase II: The EIR will describe the approach to evaluating aesthetic impacts that may arise from construction of Phase II facilities if and when their descriptions are developed and locations are identified.

Agricultural Resources

Phase I: The project area is not zoned for farming, would not result in any losses of prime farmland, and would not require the cancellation of Williamson Act contracts. Therefore no impacts would occur and no additional analysis is required in the EIR.

Phase II: Although not yet identified, it is anticipated that Phase II project locations, set within an urban context, would have no agricultural significance. This topic will not be addressed in the EIR.

Air Quality

Phase I: The EIR will evaluate construction-generated dust and criteria air pollutant emissions. There will be no Phase I air emissions from project operations.

Phase II: The EIR will describe the approach to evaluating air quality impacts that may arise from construction of Phase II facilities if and when their descriptions are developed and locations are identified.

Biological Resources

Phase I: Project facilities are adjacent to, but will not discharge water to marshes or other wetlands which are potential habitats for special-status species. The EIR will evaluate these adjacencies, along with project features and operating practices that avoid impacts to wetlands.

Phase II: The EIR will describe the approach to evaluating biological resource impacts that may arise from construction of Phase II facilities if and when their descriptions are developed and locations are identified.

Cultural Resources

Phase I: The EIR will evaluate the likelihood of undiscovered archaeological resources during construction in the area of the Phase I project’s extensometer field.

Phase II: The EIR will describe the approach to evaluating cultural resources impacts that may arise from construction of Phase II facilities if and when their descriptions are developed and locations are identified.

Geology, Soils, and Seismicity

Phase I: The EIR will evaluate geologic and topographic conditions in the context of project construction. The long-term potential for seismic hazards to affect the Phase I project will be evaluated in the EIR.

Phase II: The EIR will describe the approach to evaluating geologic and topographic conditions, and the potential for seismic hazards that may affect Phase II venues when they are identified.

Hazards and Hazardous Materials

Phase I: The EIR will evaluate the potential to encounter areas of contamination during project construction and the potential exposure of people and the environment to chemicals to be used during well head water treatment facility operation.

Phase II: The EIR will describe the approach to evaluating hazards and hazardous materials impacts that may arise from construction of Phase II facilities if and when their descriptions are developed and locations are identified.

Hydrology, Groundwater Hydrology and Surface Water Quality

Phase I: The EIR will evaluate discharges resulting from construction, well testing, and from sustained operation of the single-well during Phase I. The EIR will also describe potential groundwater basin impacts from extraction and injection including evaluating the potential for subsidence and artesian flows in surrounding wells. The potential for the project to influence the migration of chemical contaminant plumes in the shallow aquifer zones will also be assessed. Potential impacts to other deep-aquifer groundwater basin users will be evaluated in the EIR.

Phase II: The EIR will describe the approach to hydrology, groundwater hydrology, and water quality impacts that may arise from construction and operation of Phase II facilities if and when their descriptions are developed and locations are identified.

Land Use and Planning

Phase I: Phase I facilities are all located within an industrial area, and are compatible with adjoining land uses.

Phase II: The EIR will describe the approach to evaluating land use and planning impacts that may arise from construction of Phase II facilities if and when their descriptions are developed and locations are identified. EBMUD facilities for water production are exempt from local land use controls, although the project is consistent with a number of general plan policies.

Mineral Resources

Phase I: No mineral resources are located at the Phase I project site. Therefore, no impacts would occur and no additional analysis is required in the EIR.

Phase II: The EIR will describe the approach to evaluating mineral resources impacts that may arise from construction of Phase II facilities if and when their descriptions are developed and locations are identified.

Noise

Phase I: The EIR will identify noise levels likely to be generated by project construction and evaluate noise effects on the Bay Trail, the only sensitive noise receptor in the vicinity of Phase I.

Phase II: The EIR will describe the approach to evaluating noise impacts that may arise from construction of Phase II facilities if and when their descriptions are developed and locations are identified.

Population and Housing

Phase I: The project would not result in the creation of permanent jobs or the need for housing. Therefore, no impacts would occur and no project-level analysis is required.

Phase II: It is anticipated that the affects on population and housing for Phase II facility construction will be similar to those of Phase I and will not require analysis in the EIR.

Public Services

Phase I: The project will not require new public services, and will be located within a secure facility. Therefore, no impacts would occur and no additional analysis is required in the EIR.

Phase II: No additional service demands are anticipated from a future, higher-capacity project; no additional analysis is required in the EIR.

Recreation

Phase I: No portion of the project will occur within a recreation area, nor impede access to a recreation area. Therefore, no impacts would occur and no additional analysis is required.

Phase II: EBMUD anticipates no affects on recreation sites from operation of Phase II facilities, and will not include this topic in the EIR.

Transportation/Traffic

Phase I: The EIR will determine if the Phase I portion of the project will have measurable impacts on traffic, transit service or pedestrian safety during construction.

Phase II: The EIR will describe the approach to evaluating transportation and traffic impacts that may arise from construction of Phase II facilities if and when their descriptions are developed and locations are identified.

Water Quality, Treatment, and Distribution

Phase I: The EIR will evaluate the affects of introducing recovered groundwater to the EBMUD water distribution system.

Phase II: The EIR cannot include discussion of this issue, as it uncertain where and by what means groundwater and surface water would be mingled in a future, higher-capacity project.

Utilities and Service Systems

Phase I: The EIR will evaluate quantitatively the anticipated power and wastewater treatment demanded by Phase I testing and project operation, and the available capacity to meet those demands.

Phase II: The EIR will describe the approach to evaluating utility and service system impacts that may arise from construction of Phase II facilities if and when their descriptions are developed and locations are identified.

Appendix B
Bayside Groundwater 2001 DEIR Comments Summary

APPENDIX B

Bayside Groundwater 2001 DEIR Comments Summary

TABLE B-1
Bayside Groundwater Project 2001 DEIR Comment Summary

Comment Received on 2001 DEIR	How Comment is Addressed in the DEIR
Introduction, Project Objectives, and Need	
Statement of objectives is too narrow to develop a reasonable range of alternatives.	Objectives have been revised and are included in Section 2, Project Description.
The underlying objective should be to ensure that there is adequate water supply to meet the needs of East Bay water customers during periods of drought and there is a broad range of alternatives that may be able to fulfill this objective.	
Why does the District need the Freeport Project in addition to the Bayside Groundwater Project?	The relationship of the Bayside Groundwater Project and the Freeport Regional Water Project is discussed in Section 1.6.2.
Project Description	
Why is the Project located in the San Leandro/San Lorenzo Area?	Section 1.3.3.4, East Bay Groundwater Program, describes how the location for the Bayside Groundwater Project was selected.
what is the expected net amount of water in the underlying aquifer at different future times compared to a baseline year representing conditions before injection/ extraction?	Section 3.1, Groundwater Hydrology and Quality, describes the projected conditions of the aquifer underlying the Project area and the hydrologic conditions used to model/simulate groundwater conditions in the future.
What data support the robustness of the assumption that future hydrologic conditions will be similar to those of the past 75 years?	
Alternatives	
On what basis were the Project sites identified?	The alternatives analysis has been expanded as described in Section 7, Alternatives Analysis.
The DEIR should consider a fuller range of alternatives including groundwater projects outside the South East Bay Plain and the District Service Area, especially in San Joaquin County; non-project alternatives to increase water supply; projects not involving groundwater development.	
The DEIR contains too little discussion of potential conjunctive use in San Joaquin County.	
EBMUD should state the reasons for rejecting alternatives.	

TABLE B-1
Bayside Groundwater Project 2001 DEIR Comment Summary

Comment Received on 2001 DEIR	How Comment is Addressed in the DEIR
Land Use	
Need to discuss preliminary policies from General Plans that are currently being updated.	Section 4.12, Land Use, discusses the relevant polices found in the San Leandro Amended General Plan - May 2002.
The Project could significantly disrupt the people who currently use the Bay Trail and other local trail connections and bike lanes that access Hayward Regional Shoreline and other nearby locations.	As described in Section 2, Project Description, Phase 1 the modified Project includes one well which is not located near the Bay Trail or other recreation resources in the vicinity. Phase 2 wells will be evaluated in a subsequent site specific EIR.
Traffic and Transportation	
Construction traffic will be disruptive to residents and local schools. It may endanger the safety of students or recreational resource users.	These concerns are addressed in the revised Section 3.8 and 4.8, Traffic and Transportation.
Impacts of diverting commercial traffic should be addressed in concert with affected property owners and residents.	
Visual and Aesthetic Resources	
The Project may disrupt public views of the Bay from homes, streets, and trails in the Project area.	Phase 1 of the Proposed Project will have no effect upon public views of the Bay. Phase 2 will be addressed in a subsequent site-specific EIR as described in Section 4.13.
Hazards	
What plan(s) would the District have in place to respond to a chemical handling accident and thus ensure the safety of the community?	This concern is addressed in detail in Section 3.7 and 4.7, Hazards.
Biological Resources	
Mitigation measures should be revised to provide adequate information to assure that creeks, wetlands, and riparian resources would be adequately protected during construction and operation.	Section 3.4 and 4.4, Biological Resources, and Section 3.3 and 4.3, Surface Water Hydrology and Quality, include mitigation measures to protect biological resources from runoff, noise and other harmful effects during construction and operation.
Freshwater discharge into San Lorenzo Creek or Bockman Canal could affect water quality, ponding duration, and salinity within managed marsh areas, such as Oro Loma Marsh and Cogswell Marsh.	The modified Project will not include discharge to San Lorenzo Creek. Potential impacts related discharges to stormwater system are address in Section 3.4 and 4.4, Biological Resources.
Project noise could affect nesting and foraging bird species.	Impacts to nesting and foraging birds are also addressed in Section 3.4 and 4.4, Biological Resources, and 3.9 and 4.9, Noise.
Public Services and Utilities	
Knowing the location of the pipe within the roadway prism would allow for the understanding of the potential conflicts with the roadway, curb, gutter, sidewalk, existing underground utilities, and street trees.	Coordination of the pipeline alignment with existing utilities and public improvements will be undertaken through permitting.

TABLE B-1
Bayside Groundwater Project 2001 DEIR Comment Summary

Comment Received on 2001 DEIR	How Comment is Addressed in the DEIR
Geology, Soils, and Seismicity	
Will the Project cause ground subsidence or sinkholes? If so, How much subsidence will occur, over what area, and under what project conditions? What proactive steps will the District take to prevent subsidence?	These concerns are addressed in Section 3.1 and 4.1 Groundwater Hydrology and Quality.
Has subsidence already occurred due to previous pumping in the aquifer?	Inelastic subsidence is not occurring in the groundwater basin because groundwater levels are at or above historic lows.
Groundwater Hydrology and Quality	
The Project proposal should limit the acceptable drawdown of the aquifer to levels found to exist historically.	Maintaining the levels found to exist historically in the aquifer is a performance standard of the Proposed Project as stated in the Original DEIR and in this DEIR.
Evaluate the impact of flowing wells and effects on contaminant plumes in a residential and protected wetland areas.	Section 3.1 and 4.1, Groundwater Hydrology and Quality, addresses these concerns regarding groundwater.
Describe the Project’s impacts to the Niles Cone Groundwater Basin.	
Surface Water Hydrology and Quality	
How will the Project affect upstream water use?	Water supply issues are described in Section 1, Introduction; Section 2, Project Description; and Section 3.3 and 4.3, Surface Water Hydrology and Quality.
Will there be sufficient water to supply the injection/extraction operating alternative?	
Water Quality, Treatment, and Distribution	
How will the Project affect local businesses’ water quality?	Effectiveness of the proposed treatment and potential impacts to water quality for local businesses and residents and discussed in Section 3.2 and 4.2, Water Quality.
Existing groundwater quality contains manganese, radon, and elevated salinity levels. What actions will be taken to meet legal standards for drinking water quality?	
Mokelumne River	

TABLE B-1
Bayside Groundwater Project 2001 DEIR Comment Summary

Comment Received on 2001 DEIR	How Comment is Addressed in the DEIR
The DEIR does not adequately address the additional use of Mokelumne River water for the Project.	The District would divert water for aquifer recharge from any of several sources, including local watershed runoff and conserved Mokelumne River water. The project would not reduce Mokelumne Project storage levels or river flows during times of low runoff, as described in Section 2, Project Description.
Air Quality	
What chemicals would be released into the air from the Project?	Sections 3.6 and 4.6, Air Quality, describes the air emissions and potential health risks associated with the Proposed Project. This section also includes the best available control technology as mitigation measures to mitigate impacts.
What are the health risks? A more precise commitment to mitigation is necessary.	
Are more effective technologies available to mitigate the impact?	
Noise	
How will noise from construction and operation of the Project adversely affect residents in the Project area?	The modified Project described in this DEIR includes facilities that are a greater distance from residents than alternatives described in the original DEIR. Therefore, no impacts from noise are anticipated for residents in the Project area as described in Section 3.9 and 4.9, Noise. This section also summarizes compliance with relevant noise ordinances.
There is a conflict between compliance with the Alameda County Noise Ordinance and the proposed construction schedule.	
Cultural Resources	
No comments received.	—
Growth Inducement	
No comments received.	—
Cumulative Impacts	
The DEIR needs to include an analysis of the cumulative impacts of the entire supplemental water supply program, not just the limited geography of the Project area.	The cumulative impacts analysis has been updated and revised in Section 6, Cumulative Impacts.
The DEIR needs to include expanded discussion of cumulative air pollution impacts that could occur during Project operation, including consideration of the Oro Loma Water Treatment Plant.	
The DEIR should identify and characterize existing contaminated plumes and evaluate their cumulative impacts.	
The DEIR should discuss other groundwater sources.	Included in Section 1, Introduction.

TABLE B-1
Bayside Groundwater Project 2001 DEIR Comment Summary

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Mitigation	
Mitigation measures need to be feasible and more specific; operating limits should be included.	Mitigation measures throughout the DEIR meet the feasibility requirements of CEQA.
EBMUD needs to be more proactive about avoiding impacts that are irreversible once they occur.	
General	
The DEIR needs to discuss impacts on and mitigation measures for loss of property values in the San Leandro and San Lorenzo areas.	This issue is outside the scope of CEQA.
Chinese translations of environmental documentation materials should be provided for residents of Heron Bay.	Certain materials related to the environmental review process, including meeting notices, will be translated. The DEIR will be published in English only.

Appendix C
Alternatives Comparison

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Environmental Resource	Proposed Project Bayside Groundwater Project (1)	Alternative 1 No Project	Alternative 2 Conservation and Recycling	Alternative 3 Bay Area Regional Desalination	Alternative 4 East Contra Costa Groundwater Development
Groundwater Hydrology and Quality	During Phases 1 and 2, proposed groundwater injection and extraction could affect the regional groundwater system and existing well users, including the Alameda County Water District and the City of Hayward. Extraction could increase saltwater intrusion and elastic subsidence, and induce migration of existing groundwater plumes (areas with contaminated groundwater) to areas with potable water. All potentially significant impacts of Phase 1 would be less than significant with mitigation. Although a subsequent EIR is required to reach a final determination, all potentially significant impacts of Phase 2 are expected to be less than significant with mitigation.	In a severe drought, under the No Project Alternative, there is potential for an increased use of private wells for residential irrigation and associated potential impacts to the local, shallow groundwater. Impacts, however, would likely be less than significant, and there would be overall less impact to the regional groundwater system than under the Proposed Project.	Increased use of recycled water could affect groundwater depending on the recycled water quality. Generally, recycled water has higher levels of nitrate, and excessive use of recycled water for irrigation could result in nitrate contamination of shallow groundwater. However, impacts are expected to be less than significant with mitigation, and there would be overall less impact to the regional groundwater system than under the Proposed Project.	Neither construction nor operation of desalination facilities is likely to affect groundwater.	Similar to what is expected for the Proposed Project, groundwater injection and extraction would affect the regional groundwater system and existing well users. Extraction could result in increased land subsidence.
Water Quality, Treatment, and Distribution	Although no primary MCLs would be exceeded during Phases 1 and 2, the water quality changes resulting from the Proposed Project could reduce the aesthetic quality of the water. Impacts would be less than significant. All potentially significant impacts of Phases 1 and 2 would be less than significant with mitigation.	The No Project Alternative would not result in water quality impacts because, even under rationing conditions, water quality would meet all state and federal drinking water standards.	All conservation and recycled water uses would be consistent with the California Code of Regulations, Title 22. Water quality would be appropriate for designated uses, as approved by DHS. All drinking water would continue to meet state and federal standards. Therefore, no impact is anticipated.	Although specific water quality after desalination treatment not known, any water for drinking water uses would meet all state and federal standards. Therefore, no impact is anticipated.	Changes in the quality of water delivered to District customers would likely be unnoticeable following high volume dilution in the aqueducts. All potentially significant impacts are expected to be less than significant with mitigation.
Surface Water, Hydrology and Quality	During Phase 1, construction would result in increased potential for sedimentation and equipment pollutants to contact stormwater and be conveyed to receiving waters. Project operation would result in periodic discharges of backflush to Bockman Canal, and diversion of runoff from the Upper San Leandro Reservoir watershed during wet years. Impacts during Phase 2 are expected to be similar; however, depending on location and extent of facilities, Phase 2 could also result in long-term increases in stormwater runoff, and discharges could affect different receiving bodies. All potentially significant impacts during Phase 1 would be less than significant with mitigation, and it is anticipated that Phase 2 impacts would be fully mitigable as well.	No surface water, hydrology, or quality impacts would result under the No Project Alternative because no facilities would be constructed or operated.	Recycled water and conservation would not be expected to result in impacts to surface waters. By reducing wastewater effluent discharged to receiving waters, recycled water would actually result in beneficial impacts. Temporary construction impacts could be mitigated. This impact is less than the surface water impacts under the Proposed Project.	Impacts associated with disposal of brine from desalination operations have not been resolved by the RWQCB. These are potentially significant impacts, and it is not known at this time if they can be mitigated to a less than significant level. Surface water impacts would be greater than under the Proposed Project.	Similar to what is described for the Proposed Project, groundwater injection and extraction could affect the local receiving waters as a result of stormwater runoff and/or discharge of washwater. All potentially significant impacts are expected to be less than significant with mitigation.

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Biological Resources	During construction of Phase 1 facilities, there is the potential to transport sediment into adjacent sensitive biological areas. Additionally, during operation, discharge of water backflush into the storm drain could adversely affect aquatic resources by increasing turbidity, changing water temperature, reducing levels of salinity, or introducing chlorine. During Phase 1 and potentially during Phase 2, depending on the location of wells, construction activity could also disturb nesting birds near the site. All potentially significant impacts of Phase 1 would be less than significant with mitigation. Potential impacts of Phase 2 are expected to be less than significant with mitigation.	No biological resources impacts would result under the No Project Alternative because no facilities would be constructed or operated.	Depending on the location of recycling facilities, biological resources impacts could result during construction and operation, including potential effects on special-status species. Similar to what is expected for the Proposed Project, it is likely that these impacts would be mitigated to less than significant levels by relocating facilities away from sensitive habitat or imposing other mitigation measures. Impacts would be similar to the Proposed Project.	Depending on the location of desalination facilities, biological resources impacts could result during construction and operation, including potential effects on special-status species. Because of potential impacts to aquatic resources in the Bay associated with both intake of brackish water and disposal of brine, the degree of impact and mitigation effectiveness are unknown at this time.	The Bixler property is actively used as farmland and is an unlikely to have critical biotic habitat value. Discharges to local waterways that support aquatic species could result in adverse impacts. Sensitive species may also be affected by offsite pipeline construction. These impacts could likely be mitigated to less than significant levels.
Geology, Soils and Seismicity	During Phases 1 and 2, proposed structures would be subject to seismic hazards. All potentially significant impacts of Phases 1 and 2 would be less than significant with mitigation.	No geology, soils, or seismicity impacts would result under the No Project Alternative because no facilities would be constructed or operated.	Geology, soils, or seismicity impacts could result during construction and operation because facilities would be sited in the Bay Area, which is generally a highly seismically active area. Similar to what is expected for the Proposed Project, it is likely that these impacts would be mitigated to less than significant levels by imposing mitigation measures.	Geology, soils, or seismicity impacts could result during construction and operation since facilities would be sited in the Bay Area, which is generally a highly seismically active area. Similar to what is expected for the Proposed Project, it is likely that these impacts would be mitigated to less than significant levels by imposing mitigation measures.	Similar to what is expected for the Proposed Project, facilities would be subject to seismic hazards. All potentially significant impacts are expected to be less than significant with mitigation. Impacts would be the same as those of the Proposed Project.
Air Quality	During Phase 1, short-term construction would result in temporary increases in particulate matter and equipment exhaust. During Phase 2, additional air-quality impacts would result during construction. All potentially significant impacts during Phase 1 would be less than significant with mitigation.	No air-quality impacts would result under the No Project Alternative because no facilities would be constructed or operated.	Construction impacts similar to those of the Proposed Project could result depending on the location of facilities and could be mitigated. Similar to what is expected for the Proposed Project, any operational impacts could likely be mitigated.	Construction impacts similar to those of the Proposed Project could result depending on the location of facilities and could be mitigated. Similar to what is expected for the Proposed Project, any operational impacts could likely be mitigated.	Similar to what is expected for the Proposed Project, short-term construction would result in temporary increases in dust and equipment exhaust from construction. Impacts may be less than under the Proposed Project because the Bixler site is near few sensitive receptors. However, homes within Discovery Bay that could be affected by construction are closer than those near the Bayside project. All potentially significant impacts are expected to be less than significant with mitigation.
Hazards	During Phase 1 and Phase 2, construction activities could encounter hazardous materials from previous land uses. Operation of facilities would result in increased transport, handling, and storage of chemicals at the well treatment facility. Extraction and injection of groundwater could induce migration of existing groundwater plumes (areas with contaminated groundwater) to areas with potable water. All potentially significant impacts of Phase 1 would be less than significant with mitigation. Potential impacts of Phase 2 are expected to be less than significant with mitigation.	The No Project Alternative would not result in hazards impacts because no facilities would be constructed or operated.	Depending on the location of recycling facilities, hazards impacts could result during construction and operation, including potential encounters with hazardous materials from previous land uses and transport, handling, and storage of chemicals. Similar to what is expected for the Proposed Project, it is likely that these impacts would be mitigated to less than significant levels by relocating facilities away from contaminated sites or imposing other mitigation measures. Operational impacts could likely be mitigated, and overall impacts would likely be similar to the Proposed Project.	Depending on the location of desalination facilities, hazards impacts could result during construction and operation, including potential encounters with hazardous materials from previous land uses and transport, handling, and storage of chemicals. Similar to what is expected for the Proposed Project, it is likely that these impacts would be mitigated to less than significant levels by relocating facilities away from contaminated sites or imposing other mitigation measures. Operational impacts could likely be mitigated, and overall impacts would be fewer than under the Proposed Project.	The potential risk of accidental spills during transport, handling, and storage of chemicals is similar to that of the Proposed Project. These impacts would be mitigated to less than significant levels. The presence of groundwater contaminant plumes is currently unknown.

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Traffic and Transportation	Construction activities for Phase 1 would result in short-term disruption of traffic on Grant Avenue, but there would be no road closures. There would be minimal long-term increases in traffic associated with periodic staffing requirements and occasional delivery trucks. Phase 2 would also result in short-term traffic disruption that would vary depending on location of facilities; however, no road closures are anticipated. All potentially significant impacts of Phase 1 would be less than significant with mitigation. Potential impacts of Phase 2 are expected to be less than significant with mitigation.	No traffic and transportation impacts would result under the No Project Alternative because no facilities would be constructed or operated.	Depending on the location of recycling facilities, impacts to transportation and traffic could result as recycling facilities are constructed. Similar to what is expected with the Proposed Project, it is likely that these impacts would be mitigated to less than significant levels.	Depending on the location of desalination facilities, impacts to transportation and traffic could result as desalination facilities are constructed. However, because the facilities would likely be larger than those for the Proposed Project, there would likely be more traffic generated during both construction and operation. Similar to what is expected for the Proposed Project, it is likely that these impacts would be mitigated to less than significant levels.	The Bixler property is served by narrow agricultural roadways that may be inadequate for large trucks used in treatment chemical delivery. Pipeline construction in roadways may cause unavoidable travel delays because of the absence of alternative roadway choices. Transportation Impacts would be greater than under the Proposed Project.
Noise	Construction of facilities would temporarily increase ambient noise levels. Long-term noise increases during operation would not be noticeable to nearby receptors. All potentially significant impacts of Phase 1 would be less than significant with mitigation. Potential impacts of Phase 2 are expected to be less than significant with mitigation.	No noise impacts would result under the No Project Alternative because no facilities would be constructed or operated.	Construction impacts similar to those of the Proposed Project could result depending on the location of facilities and could be mitigated. No significant operational impacts would be expected, and all potentially significant impacts would likely be less than significant with mitigation.	Construction impacts similar to those of the Proposed Project could result depending on the location of facilities and could be mitigated. No significant operational impacts would be expected, and all potentially significant impacts would likely be less than significant with mitigation.	Similar to what is described for the Proposed Project, short-term construction would result in temporary increases in noise. If an aeration tower is constructed, long-term operation of the treatment plant may generate noise from ventilation equipment. If no aeration tower is built, radon would be released at the filter plants. Impacts may be greater than under the Proposed Project because a portion of the project would be located in the Discovery Bay community. All potentially significant impacts are expected to be less than significant with mitigation.
Public Services and Utilities	During both Phases 1 and 2, construction could damage or interfere with existing utility lines. Construction and operation could also increase the response times of emergency vehicles and create a substantial new demand for electricity during peak demand periods. All potentially significant impacts of Phase 1 would be less than significant with mitigation. Potential impacts of Phase 2 are expected to be less than significant with mitigation.	Severe water rationing would impact the ability of service providers and utilities to meet customer demand. Impacts could be greater under this alternative than under the Proposed Project.	Increased reclamation and conservation would require changes in water use patterns of customers, but no environmental impacts are expected. Construction and operation impacts would be the same as those of the Proposed Project.	Desalination would require a substantial amount of energy to operate. Given the relatively minor energy requirements of the Proposed Project compared to desalination, it can be assumed that the energy requirements of desalination facilities would be much greater than those of the Proposed Project.	Impacts are expected to be similar to those of the Proposed Project.
Cultural Resources	Proposed construction of Phase 1 and Phase 2 could alter the archaeological integrity of as-yet-unknown subsurface prehistoric and historic archaeological deposits. The potentially significant impact would be less than significant with mitigation. While it is not possible to determine if Phase 2 facilities could impact known prehistoric and historic archaeological deposits until facility location(s) have been identified, it is expected that proposed wells and treatment facilities would not be sited in locations with know cultural resources.	No cultural resources impacts would result under the No Project Alternative because no facilities would be constructed.	Construction impacts similar to those of the Proposed Project could result depending on the location of facilities and could likely be mitigated. No operational impacts would result.	Subsurface prehistoric and historic archaeological deposits may be discovered during construction if work proceeds in previously undisturbed areas. These impacts would be mitigated using methods similar to those for the Proposed Project.	Similar to what is described for the Proposed Project, the site is in an area of previous subsurface soil disturbance. The likelihood of discovering as-yet-unknown subsurface prehistoric and historic archaeological deposits during construction is low. All potentially significant impacts are expected to be less than significant with mitigation.

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Land Use	Under Phase 1 of the project, no land use impacts would result. Under Phase 2, it is expected that proposed wells and treatment facilities would be constructed in locations consistent with zoning and compatible with surrounding land uses and thus no land use impacts would result.	No land use impacts would result under the No Project Alternative because no facilities would be constructed or operated.	The extent of land use disruption would depend on the size and location of reclamation facilities. Impacts would likely be similar under this alternative to those under the Proposed Project, however, it is likely that they could be mitigated to less than significant levels by relocating facilities or requiring other mitigation measures.	The extent of land use disruption would depend on the size and location of desalination facilities. It is assumed that size of desalination facilities would be greater than the size of Bayside facilities. Impacts could be greater under this alternative than under the Proposed Project. Facility placement plays a large role in the degree of significance of the potential land use impact. Desalination facilities generally have less siting flexibility than other water supply facilities because they need to be located near a water source. It is possible that potential impacts could be mitigated to less than significant levels.	EBMUD's Bixler properties are designated as "Agricultural Core" and "Agricultural Lands" under the Contra Costa County General Plan. Initiating public utility use on a portion of these lands would require a finding of consistency with the General Plan.
Visual and Aesthetic Resources	Phase 1 of the project would have no visual or aesthetic impacts. Depending on the location and extent of Phase 2 facilities, some visual and aesthetic impacts could result if expansion of facilities at the Grant Avenue site were visible to some Bay Trail users. However, it is expected that any additional facilities at that site would appear within the context of existing low-rise industrial development. All impacts of Phase 1 are less than significant. All potentially significant impacts of Phase 2 are expected to be less than significant with mitigation	No visual resources impacts would result under the No Project Alternative because no facilities would be constructed or operated.	Depending on the location of recycling facilities, visual resources impacts could result during construction and operation. Similar to what is expected for the Proposed Project, it is likely that these impacts would be mitigated to less than significant levels by relocating facilities, screening them from view, or imposing other mitigation measures.	Depending on the location of desalination facilities, visual resources impacts could result during construction and operation. Similar to what is expected for the Proposed Project, it is likely that these impacts would be mitigated to less than significant levels by relocating facilities, screening them, or imposing other mitigation measures.	Introduction of built forms with an industrial appearance may be incompatible with the county's objective of preserving the Agricultural Core area. Impacts would be similar to those of the Proposed Project.

Notes:

(1) Discussion of Phase 2 impacts for the purpose of this Alternatives Analysis are preliminary based on knowledge of potential effects and the feasibility of available mitigation measures to reduce impacts to less than significant levels. A subsequent EIR will be prepared if and when EBMUD decides to pursue Phase 2.