

SOQUEL CREEK WATER DISTRICT WELL MASTER PLAN

Draft Environmental Impact Report
State Clearinghouse No. 2006072018

Prepared for
Soquel Creek Water District

September 1, 2010



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225 Bush Street
Suite 1700
San Francisco, CA 94104
415.896.5900
www.esassoc.com

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Acronyms and Abbreviations

AB	–	Assembly Bill
ABAG	–	Association of Bay Area Governments
ac-ft	–	acre-feet
ADRP	–	archaeological data recovery program
afy	–	acre-feet per year
AMBAG	–	Association of Monterey Bay Area Governments
AQMP	–	Air Quality Management Plan
ARB	–	Air Resources Board
ASCE	–	American Society of Civil Engineers
APN	–	assessor's parcel number
Basin Plan	–	The Water Quality Control Plan for the Central Coast Region
bgs	–	below the ground surface
BMP	–	Best Management Practice
C-1	–	neighborhood commercial zoning district
C-2	–	community commercial zoning district
Caltrans	–	California Department of Transportation
Cal EPA	–	California Environmental Protection Agency
CAPCOA	–	California Air Pollution Control Offices Association
CARB	–	California Air Resources Board
CAT	–	California Climate Action Team
CBC	–	California Building Code
CCR	–	California Code of Regulations
CDFG	–	California Department of Fish and Game
CDHS	–	California Department of Health Services
CDPH	–	California Department of Public Health
CDMG	–	California Division of Mines and Geology
CEQA	–	California Environmental Quality Act
CESA	–	California Endangered Species Act
CFR	–	Code of Federal Regulations
cfs	–	cubic feet per second
CGS	–	California Geological Survey
CH ₄	–	methane
CHP	–	California Highway Patrol
chromium VI	–	hexavalent chromium
CIGWRB	–	California Integrated GreenWaste Recovery Board
CIWMB	–	California Integrated Waste Management Board
CNDDb	–	California Natural Diversity Database
CNEL	–	Community Noise Equivalent Level
CNPS	–	California Native Plant Society
CO ₂	–	carbon dioxide

CO ₂ e	–	carbon dioxide equivalent
Corps	–	U.S. Army Corps of Engineers
CPUC	–	California Public Utilities Commission
CUPA	–	Certified Unified Program Agency
CUWCC	–	California Urban Water Conservation Council
CWA	–	Clean Water Act
CWD	–	Central Water District
DAVP	–	Draft Aptos Village Plan
dB	–	decibel
dBA	–	A-weighted decibel
dbh	–	(tree) diameter at breast height
Draft EIR	–	Draft Environmental Impact Report
District	–	Soquel Creek Water District
DOT	–	U.S. Department of Transportation
DPM	–	diesel particulate matter
DPS	–	Distinct Population Segment
Draft EIR	–	Draft Environmental Impact Report
DTSC	–	California Department of Toxic Substances Control
DWR	–	California Department of Water Resources
DWSAP	–	Drinking Water Source Protection Program
ECP	–	Erosion Control Plan
EIR	–	Environmental Impact Report
ERP	–	Emergency Response Plan
FCC	–	Federal Communications Commission
Fe	–	iron
FEMA	–	Federal Emergency Management Agency
FESA	–	Federal Endangered Species Act
FIRM	–	Flood Insurance Rate Map
FMMP	–	Farmland Mapping and Monitoring Program
g/bhp-hr	–	grams per brake horsepower/hour
GHG	–	greenhouse gases
GMP	–	Groundwater Management Plan
gpm	–	gallons per minute
HFCs	–	hydrofluorocarbons
Highway 1	–	State Highway 1
HMBP	–	Hazardous Materials Business Plan
HydroMetrics	–	HydroMetrics LLC
IGSM	–	Integrated Groundwater and Surface Water Model
IPCC	–	Intergovernmental Panel on Climate Change
IRP	–	Integrated Resources Plan
IRWMP	–	Integrated Regional Water Management Plan
IS/MNDs	–	Initial Study/Mitigated Negative Declarations

JPA	–	Joint Powers Agreement between SqCWD and CWD
L_{dn}	–	day-night average noise level
L_{eq}	–	time variations in noise exposure in steady-state energy level over a period (eg) of time (in hours)
LCP	–	Local Coastal Program
LOS	–	levels of service
LS	–	Less than Significant impact
LUP	–	Land Use Plan
LUST	–	Leaking Underground Storage Tank database
MBNMS	–	Monterey Bay National Marine Sanctuary
MBUAPCD	–	Monterey Bay Unified Air Pollution Control District
MCL	–	Maximum Contaminant Level
Mg	–	magnesium
mgd	–	million gallons per day
mg/L	–	milligrams per liter
MLU model	–	Multi-Layer-Unsteady groundwater model
MM	–	Modified Mercalli intensity scale
MRZ	–	Mineral Resource Zone
MS4s	–	Municipal Separate Storm Sewer Systems
msl	–	mean sea level
MTBE	–	methyl tert-butyl ethylene
MTCO ₂ e/year	–	metric tons of CO ₂ equivalent per year
Mtons	–	metric tons
N ₂ O	–	nitrous oxide
N/A	–	Not Applicable
NAHC	–	Native American Heritage Commission
NCCAB	–	North Central Coast Air Basin
NMFS	–	National Marine Fisheries Service
NO ₂	–	nitrogen dioxide
NOI	–	Notice of Intent
NOP	–	Notice of Preparation
NPDES	–	National Pollutant Discharge Elimination System
NRCS	–	National Resource Conservation Service
OEHHA	–	Office of Environmental Health Hazard Assessment
OES	–	California Office of Emergency Services
OPR	–	Office of Planning and Research
PAC	–	Public Advisory Committee
PCBs	–	polychlorinated biphenyls
PCE	–	tetrachloroethylene
PHG	–	Public Health Goal
PFCs	–	perfluorocarbons
PG&E	–	Pacific Gas & Electric

PM _{2.5}	–	particulate matter less than 2.5 microns in diameter
PM ₁₀	–	particulate matter less than 10 microns in diameter
ppb	–	parts per billion
ppd	–	pounds per day
PPV	–	predicted peak particle velocity
PR	–	park zoning district
PRC	–	Public Resources Code
proposed project	–	Well Master Plan
PSI	–	pounds per square inch
PSM	–	Potentially Significant impact, can be Mitigated to less than significant
PSU	–	Potentially Significant Unavoidable impact
PVWMA	–	Pajaro Valley Water Management Agency
RCRA	–	Federal Resource Conservation and Recovery Act of 1976
R-1	–	single family residential zoning district
RA	–	residential agriculture zoning district
RSL	–	Rural Services Line
RWQCB	–	Regional Water Quality Control Board
SAGMA	–	Soquel-Aptos Groundwater Management Alliance
SB	–	Senate Bill
SCADA	–	Supervisory Control and Data Acquisition
SCCDPW	–	Santa Cruz County Department of Public Works
SCCEHS	–	Santa Cruz County Environmental Health Services
SCCFCWCD	–	Santa Cruz County Flood Control and Water Conservation District
SCCRSWS	–	Santa Cruz County Recycling and Solid Waste Services
SCCRTC	–	Santa Cruz County Regional Transportation Commission
SCCSD	–	Santa Cruz County Sanitation District
SCWD	–	Santa Cruz Water Department
scwd ²	–	Cooperative desalination program between SCWD and SqCWD
SqCWD or District	–	Soquel Creek Water District
SDWA	–	Safe Drinking Water Act
SF ₆	–	sulfur hexafluoride
SHPO	–	State Heritage Preservation Officer
SLIC	–	Spills, Leaks, Investigation, and Cleanup Sites database
SMARA	–	Surface Mining and Reclamation Act
SO ₂	–	sulphur dioxide
SOI	–	Sphere of Influence
SU	–	Significant Unavoidable impact,
SWPPP	–	Stormwater Pollution Prevention Plan
SWRCB	–	State Water Resources Control Board
TBA	–	tert-butyl alcohol
TDS	–	total dissolved solids

TMDL	–	Total Daily Maximum Load
TPH-g	–	total petroleum hydrocarbons as gasoline
UBC	–	Uniform Building Code
ug/L	–	micrograms per liter
USA North	–	Underground Service Alert – Northern California
USDA	–	U.S. Department of Agriculture
U.S. HUD	–	U.S. Department of Housing and Urban Development
USGS	–	U.S. Geological Survey
USFWS	–	U.S. Fish and Wildlife Service
U.S. EPA	–	United States Environmental Protection Agency
USL	–	Urban Services Line
UST	–	Permitted Underground Storage Tank database
UWMP	–	Urban Water Management Plan
Vdb	–	vibration decibels
VMT	–	vehicle miles traveled
WMP	–	Well Master Plan

Glossary

A-weighted decibel (dBA): Since the human ear is not equally sensitive to all sound frequencies within the entire spectrum, human response is factored into sound descriptions in a process called “A-weighting,” expressed as “dBA.” The dBA, or A-weighted decibel, refers to a scale of noise measurement that approximates the range of sensitivity of the human ear to sounds of different frequencies.

acre-foot/year: The amount of water that covers one acre of land one foot deep in water, which equates to 325,851 gallons.

alluvium: Consists of unconsolidated mixtures of gravel, sand, clay, and silt typically deposited by streams.

asbestos: A term used for several types of naturally occurring fibrous materials found in many parts of California, some of which have been found to be cancer-causing agents.

aquifer: A geologic rock formation (or, group of rock formations or part of a formation) that contains groundwater in the spaces between sediment grains, in voids, or in fractures. Use of the term aquifer is usually restricted to those water-bearing formations capable of yielding water in sufficient quantity to constitute a usable supply source.

aquifer unit: An aquifer is often composed of interbedded geologic layers of varying composition (i.e. clays, silts, sands) referred to herein as aquifer units. Although the boundaries between aquifer units do not generally represent sharp demarcations of waterbearing and non-water bearing sediments, the permeability and transmissivity of different aquifer units can vary.

aquitard: An interbedded geologic formation within an aquifer, such as a claystone or siltstone layer, that has very low permeability and through which water cannot move.

booster pump: A surface pump used to increase pressure in a water line, or to pull from a storage tank and pressurize a water system.

casing: A plastic or steel tube that is permanently inserted in the well after drilling. Its size is specified according to its inside diameter.

coastal area: In this EIR, the coastal area refers to the interface between the land and the sea, where groundwater quality is most easily influenced by saltwater. The coastal area extends from the shoreline about one-half mile inland. Highway 1 is the boundary line for the coastal area.

confined aquifer: A confined aquifer occurs when groundwater is restricted under pressure due to layers of impermeable geologic material both above and below the aquifer. Because the water is under pressure greater than that of the atmosphere, if a well penetrates a confined aquifer, the water level in the well will rise above the top of the aquifer.

design capacity: The maximum size or capacity to which a facility or structure is designed, but which may or may not be realized during operation due to unforeseen conditions.

drawdown: Lowering of the water level in a well due to pumping.

driller's log: The written form on which well characteristics are recorded by the well driller. Drillers are required to register all water wells and send a copy of the log to the DWR and County Environmental Health Department. This supplies hydrological data and well performance test results to the public and to the well owner.

ephemeral streams: Streams that flow briefly during and immediately following storm events.

gravity flow: The use of gravity to produce pressure and water flow. A storage tank is elevated above the point of use, so that water will flow with no further pumping required. A booster pump may be used to increase pressure.

hydrogeology: The study of the interrelationships of geologic materials and processes with water, especially groundwater.

liquefaction: A phenomenon in which saturated granular sediments temporarily lose their shear strength during periods of earthquake-induced, strong groundshaking. The susceptibility of a site to liquefaction is a function of the depth, density, and water content of the granular sediments and the magnitude of earthquakes likely to affect the site.

Level of service (LOS): A qualitative description of a facility's performance based on average delay per vehicle, vehicle density, or volume-to-capacity ratios. Levels of service range from LOS A, which indicates free-flow or excellent conditions with short delays, to LOS F, which indicates congested or overloaded conditions with extremely long delays.

Maximum Contaminant Level (MCL): Legally-enforceable standards that identify the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the PHGs as is economically and technologically feasible. MCLs are set by the U.S. EPA.

overdraft: The condition of a groundwater basin in which the amount of water withdrawn by pumping exceeds the amount of water that recharges the basin over a period of years.

perched groundwater: A local saturated zone above the water table. It typically exists above an impervious layer (such as clay) with limited extent.

perforations: Slits cut into the well casing to allow groundwater to enter. May be located at more than one level, to coincide with water-bearing strata in the earth.

Pounds per Square Inch (PSI): Vertical lift in a water supply and distribution system.
2.31 vertical feet = 1 PSI.

pressure: The amount of force applied by water that is either forced by a pump, or by the gravity. Measured in pounds per square inch (PSI).

Public Health Goal (PHG): The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California EPA OEHHA.

pumping redistribution scenario: Plausible future pumping scenarios that demonstrate how SqCWD would allocate pumping among active wells without increasing overall pumping within the groundwater basin.

recovery rate: Rate at which groundwater refills the casing after the level is drawn down. This is the term used to specify the production rate of the well.

riparian: The land adjacent to a natural watercourse such as a river or stream. Riparian areas support vegetation that provides important wildlife habitat, as well as important fish habitat when sufficient to overhang the bank.

saltwater/freshwater interface: The groundwater zone along the coastal margin where fresh groundwater and ocean saltwater meet. Groundwater in this zone is brackish.

seawater intrusion: The mixing of saltwater and freshwater in a groundwater aquifer resulting from overpumping of the aquifer

SCADA system: A computer system used for gathering and analyzing real time data. Production wells and storage tanks in the SqCWD production and distribution system are monitored and controlled by a SCADA system.

special-status species: Several species known to occur within the general region of the program area are accorded “special status” because of their recognized rarity or vulnerability to habitat loss or population decline. Some of these species receive specific protection in federal and/or state endangered species legislation. Others have been designated as “sensitive species” or “species of special concern” on the basis of adopted policies of federal, state, or local resource agencies. These species are referred to collectively as “special-status species.”

static water level: Depth to the water surface in a well under static conditions (not being pumped). May be subject to seasonal changes or lowering due to depletion.

submersible pump: A motor/pump combination designed to be placed entirely below the water surface.

surface pump: A pump that is not submersible. It must be placed no more than 20 ft. above the surface of the water in the well.

sustainable yield: The amount of groundwater that can be withdrawn from an aquifer on a long-term/sustained basis without negative impacts to groundwater quality or quantity, and without

creating an undesired effect. In practice, the sustainable yield should be less than average annual recharge.

unconfined aquifer: An unconfined aquifer does not have a confining layer (an aquitard) between it and the surface, so groundwater levels are free to rise or fall with changes in recharge and discharge, as well as barometric pressure. The volume of water in an unconfined aquifer is mainly dependent on recharge, and tends to vary seasonally.

well screen: A perforated steel or plastic device placed within the well casing that draws groundwater from the surrounding geologic formations but which prevents or reduces the likelihood of sediment entering the well. The depth of the screen is based on geologic and hydraulic criteria.

well seal: Top plate of a well casing that provides a sanitary seal and support for the drop pipe and pump.

wellhead: Top of the well, at ground level.

SUMMARY

S.1 Introduction

This Draft Environmental Impact Report (EIR) assesses the potential impacts of constructing and operating the groundwater production facilities proposed by the Soquel Creek Water District (SqCWD or District) as part of the Well Master Plan (WMP or proposed project). The purpose of the proposed project is to improve redundancy and flexibility in the SqCWD's water production and distribution system while redistributing pumping away from coastal and depressed groundwater areas.

The SqCWD determined that implementation of the proposed project could have a significant effect on the environment and therefore required preparation of a EIR in compliance with the California Environmental Quality Act (CEQA). The SqCWD is the lead agency for this CEQA process. Inquiries about the project should be directed to:

Laura Brown, General Manager
Soquel Creek Water District
PO Box 1550
Capitola, CA 95010
Email: laurab@soquelcreekwater.org

S.2 Project Background

SqCWD serves a population of about 50,000 in four substantially independent service subareas within Santa Cruz County. The District encompasses seven miles of shoreline along Monterey Bay and extends from one to three miles inland into the foothills of the Santa Cruz Mountains. Ninety percent of the SqCWD's customers are residential and 10 percent are primarily commercial and institutional. There are no agricultural connections to the system. The city of Capitola is the only incorporated area within the District. Unincorporated communities include Aptos, La Selva Beach, Rio Del Mar, Seascapes, Seacliff Beach, and Soquel.

Based on average groundwater production/pumping from 2005 to 2008, the SqCWD currently produces approximately 4,830 acre-feet (1.57 billion gallons) of water annually. The District receives 100 percent of its water from groundwater aquifers within two geologic formations that underlie the SqCWD service area. The Purisima Formation aquifers provide the majority of the SqCWD's annual production for Capitola, Soquel, Seacliff Beach, and Aptos (approximately 3,030 acre-feet). The Aromas Red Sands (Aromas) aquifer provides the remaining water needed (1,800 acre-feet) for the communities of Seascapes, Rio Del Mar, and La Selva Beach.

SqCWD's water supply system consists of 18 production wells, 16 of which are currently active, approximately 130 miles of pipeline, and 18 water storage tanks. The District's water production, storage, and distribution system is operated within four individual water service areas. The total estimated production capacity of the system is about 7 million gallons per day (mgd),¹ and the total storage capacity is 7.5 million gallons. Some of the District's wells are 20 to nearly 80 years old and have lost production capacity and have grown increasingly vulnerable to mechanical failure.

S.3 Project Description

The SqCWD proposes to improve the management of its existing groundwater resources by making necessary improvements to the system's aging infrastructure through the WMP. Thus, the proposed WMP would include: (1) the development of up to four new groundwater production wells at four locations (O'Neill Ranch, Cunnison Lane, Austrian Way, and Granite Way-Aptos Village Well sites); (2) the conversion of an existing irrigation well to a municipal well (Polo Grounds Well); and (3) the abandonment and destruction of one deteriorated production well (Monterey Well); (4) the removal of two wells from production and the maintenance of those wells as inactive wells (Maplethorpe, and either T. Hopkins or Aptos Creek, depending on the performance of these wells when the proposed Granite Way-Aptos Village Well comes online). Although it is possible that not all proposed groundwater production wells would be developed for use as municipal water supply wells, project-level analyses for all four new well sites, as well as the conversion of the Polo Grounds Well to a municipal well, are presented in this EIR. All proposed wells would be completed in the Purisima Formation, and would require treatment for iron and manganese.² With the exception of the Granite Way-Aptos Village Well, which would be connected to the existing T. Hopkins Treatment Plant, new water treatment facilities are proposed adjacent to the wells for iron and manganese treatment prior to delivery to customers. Pipeline connections would be necessary to connect the new wells and treatment facilities to the existing water distribution, stormwater drainage, and sanitary sewer systems. The proposed wells and related improvements are summarized in **Table S-1**.

Under the WMP, the SqCWD would redistribute pumping both vertically and horizontally to achieve more uniform drawdown of the Soquel-Aptos Groundwater Basin, reduce susceptibility to seawater intrusion, and minimize localized pumping depressions. To address existing groundwater overdraft conditions, the SqCWD would take actions to limit District pumping from all active wells to no more than 4,800 acre-feet/year, on average, subject to the constraints of meeting water demand within each of SqCWD's four service areas and the limited capacity to transfer water between service areas. The WMP is designed specifically to be consistent with the management goals and basin management objectives of the *Groundwater Management Plan for the Soquel-Aptos Area* (SqCWD and CWD, 2007).

¹ The total estimated annual production capacity is calculated based on the maximum instantaneous pumping rates and the assumption that each well operates 50 percent of the time.

² No additional production wells are proposed in the Aromas aquifer because Service Area IV already has surplus capacity and the Aromas aquifer is currently being overdrafted; thus, the SqCWD does not want to increase production from that aquifer.

**TABLE S-1
SUMMARY OF PROPOSED WELLS AND IMPROVEMENTS**

Well Site	Service Area	Estimated Instantaneous Pumping Rate (gpm)	District-Owned Parcel?	Proposed Improvements
O'Neill Ranch	1	750	No	<ul style="list-style-type: none"> • Municipal water supply well • Iron and manganese removal treatment plant • 1,750-foot-long potable water pipeline to tie into SqCWD distribution system at Soquel Drive and Daubenbiss Avenue • Lateral connection to existing sanitary sewer main along Soquel Drive • 370-foot-long raw water pipeline to connect to existing stormwater drainage system at Soquel Drive • Emergency stationary generator • Security fencing
Cunnison Lane	1	538	Yes	<ul style="list-style-type: none"> • Municipal water supply well • Iron and manganese removal treatment plant • Lateral connections to existing sanitary sewer, stormwater drainage, and potable water distribution systems along Cunnison Lane • Emergency stationary generator • Security fencing
Austrian Way	2	250	Yes	<ul style="list-style-type: none"> • Municipal water supply well • Iron and manganese removal treatment plant • 200-foot-long lateral connection to existing sanitary sewer main at Austrian Way and Jennifer Drive • Lateral connection to existing SqCWD potable water distribution system at Austrian Drive • 600-foot-long raw water pipeline to connect to existing stormwater drainage system at Austrian Way and Vienna Drive • Emergency stationary generator • Security fencing
Granite Way–Aptos Village	2	245	No	<ul style="list-style-type: none"> • Municipal water supply well • 520-foot-long raw water pipeline to T. Hopkins Water Treatment Plant • Security fencing
Polo Grounds	3	500	No	<ul style="list-style-type: none"> • Conversion of existing irrigation well to municipal water supply well (installation of larger pump and motor) • Iron and manganese removal treatment plant • 2,690-foot-long sewer lateral to connect to sanitary sewer main at North Polo Drive • 2,680-foot-long potable water pipeline to connect to water distribution system at North Polo Drive • 560 feet of additional potable water pipeline to connect to water distribution system at South Polo Drive • 1,100-foot-long raw water pipeline to connect to existing stormwater drainage system • Emergency stationary generator • Security fencing

S.4 Project Goals and Objectives

The overall goals of the WMP are to secure a reliable groundwater supply by improving redundancy and flexibility in the system and redistributing pumping away from the coastal area, and to provide a more uniform drawdown of the groundwater basin. The WMP allows for a comprehensive approach in addressing water supply availability and distribution, groundwater management, and the collective effect of WMP components on local resources. The specific objectives of the WMP are to:

- Meet the basin management objectives of uniform drawdown of the aquifers and redistribution of pumping away from coastal areas to reduce susceptibility to seawater intrusion
- Limit the typical pumping duration of any given well to less than 12 hours per day in order to maintain sufficient local groundwater levels for effective well operation and to manage the depth and radius of residual pumping depressions
- Ensure a reliable water supply when individual wells are out of service due to maintenance, mechanical failure, or damage
- Have adequate system capacity and flexibility to respond to peak, maximum-day demand in all four service areas

The WMP is designed specifically to be consistent with the management goals and basin management objectives of the *AB 3030 Groundwater Management Plan for the Soquel-Aptos Area* (SqCWD and CWD, 2007).

S.5 Role of the EIR

This EIR is intended to be used by the SqCWD Board of Directors when considering approval of the proposed project. To support its decision on the Project, the Board must prepare written findings of fact for each significant environmental impact identified in the EIR and must also adopt a mitigation monitoring and reporting program to ensure compliance with mitigation measures during Project implementation. The EIR is also intended to be used by responsible agencies that have review and permit authority of the Project. These agencies may include Regional Water Quality Control Board (RWQCB), California Department of Public Health (CDPH), California Department of Fish and Game (CDFG), Santa Cruz County Sanitation District (SCCSD), Santa Cruz County Public Works Department, Santa Cruz County Environmental Health Department, and Monterey Bay Unified Air Pollution Control District (MBUAPCD).

Other ministerial permits/approvals not dependent on the EIR include temporary or permanent easements required for site access, utility siting, etc.

S.6 Summary of Impacts and Mitigations

Table S-2, below, presents a complete list of the impacts and mitigation measures identified for the WMP project. Impacts are related to the construction or operation of the proposed well facilities. The discussion associated with these impacts is presented in Chapter 3, Environmental Setting, Impacts, and Mitigation Measures. The level of significance for each impact was determined using significance criteria (thresholds) developed for each category of impacts; these criteria are presented in each topical section of Chapter 3. Significant impacts are those adverse environmental impacts that meet or exceed the significance thresholds; less-than-significant impacts would not exceed the thresholds. Table S-2 indicates which measures would avoid, minimize, or otherwise reduce significant impacts to a less-than-significant level.

As indicated in Table S-2, implementation of the Polo Grounds Well would not result in any significant and unavoidable impacts. At the four other proposed well sites where new wells would be drilled, the only significant and unavoidable impacts are construction impacts related to 24-hour drilling noise. No other significant and unavoidable impacts were identified. All potentially significant impacts could be reduced to a less-than-significant level with implementation of the mitigation measures presented in this EIR.

S.7 Growth Inducement Potential

The CEQA Guidelines require that an EIR evaluate the growth-inducing impact of a proposed action. Section 4.1, Growth-Inducing Potential, evaluates the secondary effects of growth associated with the implementation of the proposed project.

Implementation of the WMP would not directly induce growth, as it would not involve the development of new housing to attract additional population, nor would it indirectly induce growth by establishing substantial permanent or even short-term construction employment opportunities; construction workers for the proposed project are expected to be drawn from the local labor pool. Finally, because the WMP also would not increase the quantity of water supply available to meet additional demands, it would not indirectly induce growth by removing insufficient water supply as an obstacle to growth. Therefore, no impacts related to growth inducement would occur.

S.8 Cumulative Impacts

The CEQA Guidelines require the EIRs discuss the cumulative impacts of a project when the project's incremental effect is "cumulatively considerable," meaning that the project's incremental effects are considerable when viewed in connection with the effects of past, current, and probable future projects.

Section 4.2, Cumulative Impacts, evaluates the cumulative effects resulting from the WMP in combination with other projects or conditions, and indicates the severity of the impacts and their likelihood of occurrence. If implemented at the same time as other construction projects,

**TABLE S-2
SUMMARY OF IMPACTS**

Impact	O'Neill Ranch Well Site	Cunnison Lane Well Site	Austrian Way Well Site	Granite Way– Aptos Village Well Site	Polo Grounds Well Site
Section 3.2 Geology, Soils, and Seismicity					
Impact 3.2-1: Proposed facilities and associated infrastructure could be susceptible to damage from surface fault rupture.	LS	LS	LS	LS	LS
<i>Mitigation Measures</i>					
None required.					
Impact 3.2-2: Ground motion generated during an earthquake could result in structural damage to proposed facilities and associated infrastructure, potentially resulting in service disruptions.	LS	LS	LS	LS	LS
<i>Mitigation Measures</i>					
None required.					
Impact 3.2-3: Proposed facilities and associated infrastructure could be susceptible to seismically induced ground failure, including liquefaction and settlement.	LS	LS	LS	LS	LS
<i>Mitigation Measures</i>					
None required.					
Impact 3.2-4: Proposed facilities and associated infrastructure could be subjected to geologic hazards, including expansive soils and differential settlement.	LS	LS	LS	LS	LS
<i>Mitigation Measures</i>					
None required.					
Impact 3.2-5: Proposed facilities are located in areas susceptible to slope instability.	PSM	LS	LS	LS	LS
<i>Mitigation Measures</i>					
3.2-5: Slope Stability Analysis	X	–	–	–	–
Impact 3.2-6: Project implementation could potentially result in land subsidence that would cause substantial structural damage, flooding, or altered drainage patterns.	LS	LS	LS	LS	LS
<i>Mitigation Measures</i>					
None required.					
Impact 3.2-7: Project construction activities could result in a substantial loss of topsoil.	PSM	PSM	PSM	PSM	LS
<i>Mitigation Measures</i>					
3.4-1a: Erosion Control Plan	X	X	X	X	–

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TABLE S-2 (Continued)
SUMMARY OF IMPACTS

Impact	O'Neill Ranch Well Site	Cunnison Lane Well Site	Austrian Way Well Site	Granite Way–Aptos Village Well Site	Polo Grounds Well Site
Section 3.3 Groundwater Resources					
Impact 3.3-1: Increased production capacity would enable SqCWD to increase pumping, potentially causing or exacerbating unfavorable groundwater conditions in the Soquel-Aptos Groundwater Basin.	Beneficial impact with implementation of WMP				
Mitigation Measures					
None required.					
Impact 3.3-2: Implementation of the WMP could result in physical damage to nearby non-District wells caused by depressed static water levels below the top of the well screen or a loss of yield such that there is an appreciable diminution in the quantity or quality of water.	PSM	PSM	PSM	PSM	PSM
Mitigation Measures					
3.3-2a: Voluntary Monitoring and Mitigation Program for Private Wells	X	X	X	X	X
3.3-2b: Adaptive Management to Address Restrictive Effects at SCWD Wells	X	–	–	–	–
3.3-2c: Adaptive Management to Address Restrictive Effects at CWD Wells	–	–	–	–	X
Impact 3.3-3: Implementation of the WMP could otherwise substantially degrade the quality of groundwater resources in the Basin such that one or more of its beneficial uses would be compromised.	LS	PSM	N/A	N/A	N/A
Mitigation Measures					
3.3-3: Operating Restrictions for Cunnison Lane Well	–	X	–	–	–
Impact 3.3-4: Implementation of the WMP would provide adaptation benefits for the generally accepted outcomes of climate change on water supply resources.	Beneficial impact with implementation of WMP				
Mitigation Measures					
None required.					
Section 3.4 Surface Water Hydrology and Water Quality					
Impact 3.4-1: Implementation of the WMP could result in construction-related erosion and impacts to water quality.	PSM	PSM	PSM	PSM	LS
Mitigation Measures					
3.4-1a: Erosion Control Plan	X	X	X	X	–
3.4-1b: Construction Best Management Practices	X	X	X	X	–

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TABLE S-2 (Continued)
SUMMARY OF IMPACTS

Impact	O'Neill Ranch Well Site	Cunnison Lane Well Site	Austrian Way Well Site	Granite Way– Aptos Village Well Site	Polo Grounds Well Site
Section 3.4 Surface Water Hydrology and Water Quality (cont.)					
Impact 3.4-2: Concentrated raw groundwater discharges from periodic maintenance activities and well pump testing could cause scouring and erosion along creek banks and channels.	PSM	PSM	PSM	PSM	PSM
<i>Mitigation Measures</i>					
3.4-2: Coordinate Raw Groundwater Discharges with SCCDPW	X	X	X	X	X
Impact 3.4-3: The proposed redistribution of groundwater pumping could adversely affect the baseflow in local creeks.	LS	LS	LS	LS	LS
<i>Mitigation Measures</i>					
None required.					
<i>Improvement Measures</i>					
HYD-1: Monitor Streamflow along Soquel Creek and Modify Pumping if Baseflow Depletion is Detected	X	–	–	–	–
HYD-2: Monitor Streamflow along Aptos Creek and Modify Pumping if Baseflow Depletion is Detected	–	–	X	–	–
Impact 3.4-4: Implementation of the WMP could increase flooding hazards as a result of altered drainage patterns or an increase in the volume of stormwater runoff from the proposed well sites.	PSM	PSM	PSM	PSM	PSM
<i>Mitigation Measures</i>					
3.4-2: Coordinate Raw Groundwater Discharges with SCCDPW	X	X	X	X	X
Section 3.5 Biological Resources					
Impact 3.5-1: Construction activities could result in temporary disturbance to or mortality of Santa Cruz tarplant, a federal and state endangered species.	N/A	PSM	PSM	N/A	N/A
<i>Mitigation Measures</i>					
3.5-1a: Botanical Surveys for Santa Cruz Tarplant	–	X	X	–	–
3.5-1b: Avoidance Measures for Santa Cruz Tarplant	–	X	X	–	–
Impact 3.5-2: Construction activities could result in removal of or damage to mature oak and riparian trees that are within or adjacent to the construction footprint.	PSM	PSM	PSM	PSM	PSM
<i>Mitigation Measures</i>					
3.5-2a: Tree Survey	X	X	X	–	X
3.5-2b: Protective Measures for Mature Trees	X	X	X	X	X
3.5-2c: Tree Replacement	X	X	X	X	X
3.5-2d: Monitoring for Replacement Plantings	X	X	X	X	X

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TABLE S-2 (Continued)
SUMMARY OF IMPACTS

Impact	O'Neill Ranch Well Site	Cunnison Lane Well Site	Austrian Way Well Site	Granite Way– Aptos Village Well Site	Polo Grounds Well Site
Section 3.5 Biological Resources (cont.)					
Impact 3.5-3: Construction activities could result in impacts to aquatic habitat through degradation of water quality and impacts to riparian habitat through tree removal.	PSM	PSM	PSM	PSM	PSM
<i>Mitigation Measures</i>					
3.4-1a: Erosion Control Plan	X	X	X	X	–
3.4-1b: Construction Best Management Practices	X	X	X	X	–
3.5-2a: Tree Survey	X	X	X	–	X
3.5-2b: Protective Measures for Mature Trees	X	X	X	–	X
3.5-2c: Tree Replacement	X	X	X	–	X
3.5-2d: Monitoring for Replacement Plantings	X	X	X	–	X
Impact 3.5-4: Construction activities could result in impacts to special-status aquatic species.	PSM	PSM	N/A	N/A	PSM
<i>Mitigation Measures</i>					
3.5-4a: Biological Monitor and Biological Resources Education Program	X	X	–	–	X
3.5-4b: Avoidance Measures for Special-Status Aquatic Species	X	X	–	–	X
3.5-4c: Construction Monitoring	X	X	–	–	X
Impact 3.5-5: Implementation of the WMP could result in impacts to special-status bird species.	PSM	PSM	PSM	PSM	PSM
<i>Mitigation Measures</i>					
3.5-5: Protective Measures for Special-Status Birds	X	X	X	X	X
Impact 3.5-6: Implementation of the WMP could result in impacts to special-status bat species.	PSM	PSM	PSM	PSM	PSM
<i>Mitigation Measures</i>					
3.5-6: Bat Avoidance Measures	X	X	X	X	X
Impact 3.5-7: Implementation of the WMP could result in impacts to San Francisco dusky-footed woodrat.	PSM	PSM	PSM	N/A	PSM
<i>Mitigation Measures</i>					
3.5-7: Avoidance Measures for San Francisco Dusky-Footed Woodrat	X	X	X	–	X

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TABLE S-2 (Continued)
SUMMARY OF IMPACTS

Impact	O'Neill Ranch Well Site	Cunnison Lane Well Site	Austrian Way Well Site	Granite Way– Aptos Village Well Site	Polo Grounds Well Site
Section 3.5 Biological Resources (cont.)					
Impact 3.5-8: Implementation of the WMP could result in impacts to common wildlife and migratory wildlife corridors.	LS	LS	LS	LS	LS
<i>Mitigation Measures</i>					
None required.					
Impact 3.5-8: Project operations could have adverse effects on special status fish species.	LS	LS	LS	LS	LS
<i>Mitigation Measures</i>					
None required.					
<i>Improvement Measures</i>					
HYD-1: Monitor Streamflow along Soquel Creek and Modify Pumping if Baseflow Depletion is Detected	X	–	–	–	–
HYD-2: Monitor Streamflow along Aptos Creek and Modify Pumping if Baseflow Depletion is Detected	–	–	X	–	–
Section 3.6 Land Use and Recreation					
Impact 3.6-1: Construction activities could result in direct and indirect impacts to established recreational uses and activities.	N/A	N/A	LS	N/A	PSM
<i>Mitigation Measures</i>					
3.6-1: Construction Notification and Event Scheduling at Polo Grounds Regional Park	–	–	–	–	X
3.8-2a: Noise Controls During Daytime Construction	–	–	X	–	–
3.9-3b: Traffic Management Plan	–	–	–	–	X
Impact 3.6-2: Operation and maintenance of facilities proposed under the WMP could result in long-term impacts to adjacent recreational uses and activities.	N/A	N/A	LS	N/A	LS
<i>Mitigation Measures</i>					
None required.	–	–	–	–	–
Impact 3.6-3: Construction activities at the Polo Grounds Well site would temporarily increase the use of other recreational facilities in the area.	N/A	N/A	N/A	N/A	LS
<i>Mitigation Measures</i>					
None required.	–	–	–	–	–

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TABLE S-2 (Continued)
SUMMARY OF IMPACTS

Impact	O'Neill Ranch Well Site	Cunnison Lane Well Site	Austrian Way Well Site	Granite Way– Aptos Village Well Site	Polo Grounds Well Site
Section 3.6 Land Use and Recreation (cont.)					
Impact 3.6-4: Implementation of the WMP could conflict with goals, policies, and programs of affected jurisdictions.	PSM	PSM	PSM	PSM	PSM
<i>Mitigation Measures</i>					
3.4-1a: Erosion Control Plan	X	X	X	X	–
3.4-1b: Construction Best Management Practices	X	X	X	X	–
3.5-2a: Tree Survey	X	X	X	–	X
3.5-2b: Protective Measures for Mature Trees	X	X	X	X	X
3.5-2c: Tree Replacement	X	X	X	X	X
3.5-2d: Monitoring for Replacement Plantings	X	X	X	X	X
3.8-1a: Nighttime Noise Controls During Well Drilling	X	X	X	X	–
3.8-1b: Hotel Accommodations During Nighttime Well Drilling	–	X	X	–	–
3.8-1c: Nighttime Well Drilling Notification	X	X	X	X	–
3.8-2a: Noise Controls During Daytime Construction	X	X	X	X	–
3.8-2b: Construction Notification	X	X	X	X	–
Impact 3.6-4: Implementation of the WMP could conflict with goals, policies, and programs of affected jurisdictions.	PSM	PSM	PSM	PSM	PSM
<i>Mitigation Measures</i>					
None required.					
Section 3.7 Air Quality and Greenhouse Gases					
Impact 3.7-1: Construction activities associated with proposed facilities could generate significant emissions of criteria pollutants, including particulate matter.	LS	LS	LS	LS	LS
<i>Mitigation Measures</i>					
None required.					
Impact 3.7-2: Operation and maintenance of the proposed facilities would result in increased air pollutant emissions.	LS	LS	LS	LS	LS
<i>Mitigation Measures</i>					
None required.					
Impact 3.7-3: Installation and operation of the proposed facilities could contribute to a significant cumulative impact to air quality.	LS	LS	LS	LS	LS
<i>Mitigation Measures</i>					
None required.					

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TABLE S-2 (Continued)
SUMMARY OF IMPACTS

Impact	O'Neill Ranch Well Site	Cunnison Lane Well Site	Austrian Way Well Site	Granite Way–Aptos Village Well Site	Polo Grounds Well Site
Section 3.7 Air Quality and Greenhouse Gases (cont.)					
Impact 3.7-4: Installation and operation of the proposed facilities could generate GHG emissions that could have a significant impact on the environment.	LS	LS	LS	LS	LS
<i>Mitigation Measures</i>					
None required.					
Impact 3.7-5: Construction and operation of the proposed facilities could result in objectionable odors.	LS	LS	LS	LS	LS
<i>Mitigation Measures</i>					
None required.					
Section 3.8 Noise and Vibration					
Impact 3.8-1: Well drilling construction activities would temporarily generate nighttime noise levels that would adversely affect nearby sensitive receptors and would be inconsistent with the local noise ordinance.	SU	SU	SU	SU	N/A
<i>Mitigation Measures</i>					
3.8-1a: Nighttime Noise Controls During Well Drilling	X	X	X	X	–
3.8-1b: Hotel Accommodations During Nighttime Well Drilling	–	X	X	X	–
3.8-1c: Nighttime Well Drilling Notification	X	X	X	X	–
Impact 3.8-2: Daytime construction activities would temporarily generate noise levels that would adversely affect nearby sensitive noise receptors.	PSM	PSM	PSM	PSM	LS
<i>Mitigation Measures</i>					
3.8-2a: Noise Controls During Daytime Construction	X	X	X	X	–
3.8-2b: Construction Notification	X	X	X	X	–
Impact 3.8-3: Construction of the proposed facilities could damage structures or generate vibrations that would cause annoyance or interference with vibration-sensitive activities.	LS	LS	LS	LS	N/A
<i>Mitigation Measures</i>					
None required.					
Impact 3.8-4: Operation and maintenance of the proposed facilities could generate noise levels above existing ambient levels.	LS	PSM	PSM	PSM	LS
<i>Mitigation Measures</i>					
3.8-4a: Submersible Pump	–	X	X	X	–
3.8-4b: Generator Noise Attenuation Features	–	X	X	–	–

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TABLE S-2 (Continued)
SUMMARY OF IMPACTS

Impact	O'Neill Ranch Well Site	Cunnison Lane Well Site	Austrian Way Well Site	Granite Way–Aptos Village Well Site	Polo Grounds Well Site
Section 3.9 Traffic and Circulation					
Impact 3.9-1: Short-term traffic increases on local roadways due to construction-related vehicle trips.	PSM	PSM	PSM	PSM	PSM
<i>Mitigation Measures</i>					
3.9-1: Designated Haul Routes	X	X	X	X	X
Impact 3.9-2: Construction activities associated with individual well sites could increase wear-and-tear on the designated haul routes used by construction vehicles to access the sites.	PSM	PSM	PSM	PSM	PSM
<i>Mitigation Measures</i>					
3.9-2: Rehabilitation of Damaged Roads	X	X	X	X	X
Impact 3.9-3: Construction activities related to pipeline installation could temporarily increase traffic congestion and safety hazards on local roadways.	PSM	PSM	PSM	PSM	PSM
<i>Mitigation Measures</i>					
3.9-3a: Road Encroachment Permit Requirements	X	X	X	X	X
3.9-3b: Traffic Management Plan	X	X	X	X	X
3.9-3c: Special Construction Techniques	X	X	X	X	X
3.9-3d: Circulation and Detour Plan	X	X	X	X	–
Impact 3.9-4: Pipeline installation could temporarily disrupt emergency access along pipeline alignments.	PSM	PSM	PSM	PSM	PSM
<i>Mitigation Measures</i>					
3.9-3b: Traffic Management Plan	X	X	X	X	X
Impact 3.9-6: Construction activities would have temporary impacts on public transportation, bicycle, and pedestrian facilities.	PSM	PSM	PSM	PSM	PSM
<i>Mitigation Measures</i>					
3.9-3b: Traffic Management Plan	X	X	X	X	X
3.9-5: Consultation with Santa Cruz METRO	X	–	–	–	–
Section 3.10 Hazardous Materials					
Impact 3.10-1: Construction of project components could expose construction workers, the public, or the environment to contaminated soil or groundwater.	PSM	PSM	PSM	PSM	PSM
<i>Mitigation Measures</i>					
3.10-1: Hazardous Materials Handling and Disposal	X	X	X	X	X

LS = Less than Significant impact, no mitigation required
 PSM= Potentially Significant impact, can be Mitigated to less than significant
 SU = Significant Unavoidable impact

PSU = Potentially Significant Unavoidable impact
 N/A = Not Applicable or no impact

X = Mitigation measure applies
 – = Mitigation not applicable for this impact

*** Note: Mitigation measures may appear under more than one impact if they are needed to reduce more than one impact to less than significant. If the mitigation measure is not needed to reduce the impact to less than significant at a particular well site, it is indicated as not applicable even though it may be applicable to that well site under a different impact.

TABLE S-2 (Continued)
SUMMARY OF IMPACTS

Impact	O'Neill Ranch Well Site	Cunnison Lane Well Site	Austrian Way Well Site	Granite Way– Aptos Village Well Site	Polo Grounds Well Site
Section 3.10 Hazardous Materials (cont.)					
Impact 3.10-2: Hazardous materials could be accidentally released into the soil, groundwater, and/or a nearby surface water body during construction.	PSM	PSM	PSM	PSM	LS
<i>Mitigation Measures</i>					
3.4-1b: Construction Best Management Practices	X	X	X	X	–
Impact 3.10-3: Well pumping in the vicinity of known groundwater contamination sites could potentially interfere with remediation activities.	LS	PSM	N/A	N/A	N/A
<i>Mitigation Measures</i>					
3.3-3: Operating Restrictions for Cunnison Lane Well	–	X	–	–	–
Impact 3.10-4: Well and treatment plant operations would include storage and use of hazardous materials and petroleum hydrocarbons. Improper handling or accidental release could result in adverse effects to human health and/or the environment.	LS	LS	LS	N/A	LS
<i>Mitigation Measures</i>					
None required.					
Impact 3.10-5: Project construction and operation could create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	LS	LS	LS	LS	LS
<i>Mitigation Measures</i>					
None required.					
Impact 3.10-6: Implementation of the WMP could increase the risk of wildland fires in high fire hazard areas.	LS	LS	LS	LS	LS
<i>Mitigation Measures</i>					
None required.					
Section 3.11 Utilities and Service Systems					
Impact 3.11-1: Construction activities could potentially result in utility conflicts, disrupt or require relocation of existing utility lines, or temporarily interrupt utility services.	PSM	PSM	PSM	PSM	PSM
<i>Mitigation Measures</i>					
3.11-1: Measures to Minimize Impacts to Affected Utilities	X	X	X	X	X

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TABLE S-2 (Continued)
SUMMARY OF IMPACTS

Impact	O'Neill Ranch Well Site	Cunnison Lane Well Site	Austrian Way Well Site	Granite Way– Aptos Village Well Site	Polo Grounds Well Site
Section 3.11 Utilities and Service Systems (cont.)					
Impact 3.11-2: Disposal of project-related construction waste could result in adverse effects on landfill capacity and conflict with solid waste statutes and regulations.	PSM	PSM	PSM	PSM	PSM
<i>Mitigation Measures</i>					
3.11-2: Waste Management Plan	X	X	X	X	X
Impact 3.11-3: Implementation of the WMP could result in adverse effects on wastewater treatment facilities	PSM	PSM	PSM	PSM	PSM
<i>Mitigation Measures</i>					
3.11-3: Assess Sewer Service Availability	X	X	X	X	X
Impact 3.11-4: Project construction activities would result in a short-term increase in energy use.	LS	LS	LS	LS	LS
<i>Mitigation Measures</i>					
None required.					
Impact 3.11-5: Operation of wells and treatment facilities could increase operational energy demand.	LS	LS	LS	LS	LS
<i>Mitigation Measures</i>					
None required.					
Section 3.12 Cultural Resources					
Impact 3.12-1: Implementation of the WMP could result in impacts to historical resources or unique archaeological resources, including those that have not been previously identified.	PSM	PSM	PSM	PSM	PSM
<i>Mitigation Measures</i>					
3.12-1a: Accidental Discovery Measures	X	X	X	X	X
3.12-1b: Archaeological Monitor During Construction	–	–	–	X	–
Impact 3.12-2: Implementation of the WMP could result in adverse effects on paleontological resources.	PSM	PSM	PSM	PSM	PSM
<i>Mitigation Measures</i>					
3.12-2: Paleontological Discovery Measures	X	X	X	X	X

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TABLE S-2 (Continued)
SUMMARY OF IMPACTS

Impact	O'Neill Ranch Well Site	Cunnison Lane Well Site	Austrian Way Well Site	Granite Way– Aptos Village Well Site	Polo Grounds Well Site
Section 3.13 Aesthetics					
Impact 3.13-1: Project construction activities could temporarily degrade the visual character of the sites and their surroundings.	PSM	PSM	PSM	PSM	PSM
<i>Mitigation Measures</i>					
3.13-1: Maintain Clean and Orderly Construction Sites	X	X	X	X	X
Impact 3.13-2: The proposed wells and treatment facilities could result in permanent adverse impacts on the visual character of the sites and their surroundings.	PSM	PSM	PSM	PSM	PSM
<i>Mitigation Measures</i>					
3.13-2a: Compatible Facility Design	X	X	X	X	X
3.13-2b: Aptos Village Design Elements	–	–	–	X	–
Impact 3.13-3: Implementation of the proposed well and treatment facilities would introduce new permanent sources of light and glare.	LS	LS	LS	LS	LS
<i>Mitigation Measures</i>					
None required.					

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 PSM= Potentially Significant impact, can be Mitigated to less than significant
 SU = Significant Unavoidable impact

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construction of facilities could contribute to potential short-term cumulative effects associated with erosion, disturbance of adjacent land uses, traffic disruption, dust generation, construction noise, and visual resources disturbance. With the incorporation of appropriate mitigation measures, construction of facilities under the WMP would not result in a considerable contribution to cumulative construction impacts. Future pumping by the District at the O'Neill Ranch Well site, in combination with the Beltz Well #12 project proposed by the Santa Cruz Water Department (SCWD), could contribute to long-term cumulative effects associated with localized groundwater drawdown. With incorporation of appropriate mitigation measures, facility operations would not result in a considerable contribution to cumulative groundwater impacts.

S.9 Analysis of Alternatives

CEQA Guidelines require 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. Chapter 5, Alternatives Analysis, evaluates the potential alternatives to the proposed project. The alternatives that were evaluated in detail and in comparison to the proposed project are:

- Alternative 1: No Project
- Alternative 2: Reduced Project
- Alternative 3: Suncatcher Court Site in Lieu of the O'Neill Ranch Site

The CEQA Guidelines require the identification of an environmentally superior alternative to the proposed project (Section 15126.6[e]). If it is determined that the “no project” alternative would be the environmentally superior alternative, then the EIR shall also identify an environmentally superior alternative among the other project alternatives (Section 15126.6[3]).

While the No Project Alternative would avoid all of the construction and operational impacts of the proposed project, impacts on groundwater resources would be significantly greater due to the inability of the District to effectively manage District pumping in the Soquel-Aptos Groundwater Basin. The impacts of the Suncatcher Court Site in Lieu of the O'Neill Ranch Site Alternative would be the same as the proposed project, except impacts at the O'Neill Ranch Well site would instead be expected to occur at the Suncatcher Court site. The Reduced Project Alternative would avoid all impacts at either the Cunnison Lane or Austrian Way sites, but would result in the same impacts at the remaining four well sites. The Reduced Project Alternative is considered the environmentally superior alternative.

S.10 Areas of Controversy

During the public scoping meeting, held on July 18, 2006, meeting attendees commented on the scope of the EIR. Written comments were also received during the scoping period between July 5, 2006 and August 4, 2006. Issues that were raised during public scoping are summarized in Chapter 1, Introduction. Refer to **Appendix A** for the Notice of Preparation (NOP) and **Appendix B** for the comments received during NOP circulation.

One area of technical and scientific controversy has been identified for the WMP project regarding the geology of the Purisima Formation in the western portion of SqCWD's service area. The hydrogeologic consultant for the City of Santa Cruz Water Department (SCWD), Hopkins Groundwater Consultants (Hopkins), has presented an alternative interpretation of the geology of the Purisima Formation in the western portion of the SqCWD's service area that differs from the interpretation of the SqCWD's hydrogeologist, HydroMetrics LLC (HydroMetrics), used in this EIR for evaluation of groundwater impacts. As described in Section 3.3, Groundwater Resources, the Purisima Formation is a collection of distinct geologic units that have been assigned the identification letters AA through F, with Purisima Unit AA being the deepest and oldest unit and Purisima Unit F being the shallowest and youngest of the units. Of the Purisima Units, Unit A outcrops the closest to shore and is closest to the SCWD's Live Oak Wells.

Hopkins' interpretation of the Purisima Formation states that Purisima Unit A in the western portion of the Soquel-Aptos Groundwater Basin is deeper than previously published interpretations of the aquifer. As a result, the SCWD maintains that the SqCWD's existing Main Street Well and the proposed O'Neill Ranch Well produce a significant amount of groundwater from Purisima Unit A, which is the primary water bearing unit in which the SCWD's existing Live Oak Wells are screened (Hopkins Groundwater Consultants, 2009).

The analysis of hydrologic and hydrogeologic effects performed by HydroMetrics for this EIR (HydroMetrics, 2009) is based on the geologic interpretations presented in the *Groundwater Assessment of Alternative Conjunctive Use Scenarios - Technical Memorandum 2: Hydrogeologic Conceptual Model* report (Johnson et al., 2004), which indicate that water produced from the Main Street Well, as well as water that would be produced from the proposed O'Neill Ranch Well, is derived from Purisima Unit AA and possibly from the Santa Margarita Sandstone or Lompico Sandstone (referred to as the Tu aquifer³ in Section 3.3 of this EIR), and that very little water is derived directly from the overlying Purisima Unit A. If the analysis of potential drawdown effects from future pumping in the vicinity of the O'Neill Ranch Well presented under Impact 3.3-2 in Section 3.3 were based on the alternate interpretation proposed by Hopkins, the effects could be greater.

Due to these different interpretations of Purisima Unit A, the mitigation measures for groundwater resources prescribed in this EIR are designed to address any uncertainties regarding groundwater conditions in the western portion of the groundwater basin.

³ As described in Table 3.3-1 in Section 3.3, Groundwater Resources, the Tu aquifer comprises the lower part of the tertiary-age sediments below the base of the Purisima Formation.

S.11 References – Summary

Hopkins Groundwater Consultants. *Hydrogeological Conditions Study of Live Oak - Capitola Area Soquel-Aptos Groundwater Basin*, prepared for City of Santa Cruz Water Department, October 2009.

HydroMetrics LLC, *Hydrologic Effects of Well Master Plan*, November 2009.

Johnson, N. M., D. Williams, E.B. Yates, and G. Thrupp. *Groundwater Assessment of Alternative Conjunctive Use Scenarios – Technical Memorandum 2: Hydrogeologic Conceptual Model*, Prepared for Soquel Creek Water District, September 2004.

Soquel Creek Water District (SqCWD) and Central Water District (CWD), *AB 3030 Groundwater Management Plan for the Soquel-Aptos Area, Santa Cruz County, California*, February 2007.

CHAPTER 1

Introduction

1.1 Purpose of the EIR

The Soquel Creek Water District (SqCWD or District) is the lead agency responsible for California Environmental Quality Act (CEQA) environmental review of projects sponsored by the SqCWD. The SqCWD has prepared this Draft Environmental Impact Report (Draft EIR) to provide the public, and responsible and trustee agencies reviewing this project, with information about the potential physical effects, both beneficial and adverse, on the local and regional environment associated with implementation of the District's Well Master Plan (WMP). This EIR was prepared in compliance with the California Environmental Quality Act (CEQA) (California Public Resources Code, Sections 21000 et seq.), the CEQA Guidelines, and the California Code of Regulations (Title 14, Chapter 3, Sections 15000 et seq.). CEQA requires the preparation of an EIR when a project could significantly affect the physical environment.

This EIR includes a description of the proposed project and the environmental setting, identifies potential physical environmental impacts associated with project construction and operations, prescribes mitigation measures for significant and potentially significant impacts, identifies environmental impacts determined to be significant and unavoidable, and compares and evaluates a reasonable range of project alternatives. Significance criteria are defined in the beginning of each impact analysis section in Chapter 3, Environmental Setting, Impacts, and Mitigation Measures. This EIR also evaluates the cumulative impacts of the proposed project and evaluates alternatives to the project.

1.2 CEQA EIR Process

The environmental review process for the WMP project is being conducted in compliance with CEQA and is described below.

1.2.1 Notice of Preparation

In accordance with Section 15082 of CEQA Guidelines, SqCWD, as Lead Agency, prepared a Notice of Preparation (NOP) of an EIR (see **Appendix A**). The NOP was circulated on July 5, 2006 to local, state, and federal agencies, and to other interested parties. No Initial Study was prepared because the District decided in advance that a full EIR would be required for this project. As indicated in the NOP, the Draft EIR includes project-specific analyses examining the types of impacts specific to implementation of the WMP, including impacts from construction

and operation of the municipal supply wells, impacts to groundwater hydrology, secondary effects of growth, and cumulative impacts. The NOP provided a description of the proposed action and a preliminary list of potential environmental impacts.

1.2.2 Public Scoping

The purpose of scoping is to present the proposed project to interested parties and to solicit input from them on the appropriate scope, focus, and content of the Draft EIR. A public scoping meeting was held at the District Office Board Room (5180 Soquel Drive, Soquel, CA) on July 18, 2006 to present the project, receive input on well location development, and receive comments on the content of the EIR and scope of analysis. Public notices were placed in local newspapers informing the general public of the scoping meeting. Additional coordination with public agencies was provided through informal consultation conducted throughout the Draft EIR process. Several organizations and citizens commented on the NOP (written comments are provided in **Appendix B**). The following issues and concerns were raised during the scoping period (commenter in parenthesis):

- Potential impacts to Santa Cruz Water Department's Live Oak Well Field in the vicinity of O'Neill Ranch Well site. (Santa Cruz Water Department)
- Potential impacts to Central Water District's Rob Roy Well Field and Cox Road Well Field in the vicinity of Polo Grounds Well site. (Central Water District)
- Potential zoning conflicts at O'Neill Ranch Well site with proposed extension of 41st Avenue. (County of Santa Cruz Redevelopment Agency)
- Potential impacts to neighboring wells and the possible interaction between the proposed Cunnison Lane Well and a MTBE contamination site. (Citizen)

In response to these issues raised during the public scoping process, the SqCWD took several actions prior to commencing the Draft EIR. In February 2007, the Soquel-Aptos Area Groundwater Management Committee, formed under a Joint Powers Agreement between SqCWD and Central Water District, updated the *AB 3030 Groundwater Management Plan for the Soquel-Aptos Area*. The updated Groundwater Management Plan establishes basin management goals and objectives, describes a series of elements (i.e., programs and projects) to meet basin management goals and objectives, and adopts monitoring protocols that promote efficient and effective groundwater management and assist in estimating stream-aquifer interactions. In addition, the District's consulting hydrogeologist, HydroMetrics LLC, evaluated the potential effects of implementing the WMP in terms of: (1) physical damage to nearby non-District wells from localized lowering of groundwater levels as a result of the proposed wells; (2) unacceptable loss of well yield in nearby wells due to drawdown, redistribution of pumping, and during drought conditions; and (3) flow impacts to nearby creeks. SqCWD also engaged in ongoing discussions with the Santa Cruz County Redevelopment Agency to develop a site design and layout that would both accommodate the proposed well at the O'Neill Ranch Well site and allow for the possible future extension of 41st Avenue as indicated in the Santa Cruz County Redevelopment Plan.

1.2.3 Public Review

This document is being circulated to local, state, and federal agencies, and to interested organizations and individuals who may wish to review and comment on the report. Publication of this Draft EIR marks the beginning of a 45-day public review period, during which written comments may be directed to the following address:

Laura Brown, General Manager
Soquel Creek Water District
PO Box 1550
Capitola, CA 95010
Email: laurab@soquelcreekwater.org

The Draft EIR can also be accessed through the internet at: www.soquelcreekwater.org

1.2.4 Responses to Comments and Final EIR

Written and oral comments received in response to the Draft EIR will be addressed in a Responses to Comments document. The document will be released for public review. The Draft EIR and the Responses to Comments document will together constitute the Final EIR. The SqCWD Board of Directors will then consider EIR certification. Upon EIR certification, SqCWD may proceed to take action on project approval. If SqCWD approves the project even though significant impacts identified by the EIR cannot be mitigated, the District must make one or more written findings for each of those significant impacts, accompanied by a brief explanation of the rationale for each finding (CEQA Guidelines Section 15091).

1.2.5 Mitigation Monitoring and Reporting

At the time of project approval, CEQA requires lead agencies to “adopt a reporting and mitigation monitoring program for the changes to the project which it has adopted or made a condition of project approval in order to mitigate or avoid significant effects on the environment” (CEQA, Section 21081.6; CEQA Guidelines, Section 15097). This Draft EIR identifies and presents mitigation measures that would form the basis of such a monitoring program. Any measures adopted by the SqCWD as conditions for approval of the WMP will be included in the Mitigation Monitoring and Reporting Program to ensure compliance.

1.2.6 Organization of this EIR

This EIR is organized as follows:

- **Summary.** This chapter presents a summary of the proposed project, environmental impacts and mitigation measures, cumulative analyses, and project alternatives.
- **Chapter 1, Introduction.** This chapter describes the purpose and organization of the EIR, as well as the environmental review process.

- **Chapter 2, Project Description.** This chapter describes the proposed project, including project objectives, a summary of project components, and information about project construction and proposed operations. The chapter also lists required permits and approvals.
- **Chapter 3, Environmental Setting, Impacts, and Mitigation Measures.** This chapter is subdivided into sections for each environmental resource topic. Each section describes the environmental and regulatory setting, significance criteria, and approach to the analysis for that resource topic. It then presents an analysis of potential environmental impacts and the project-specific mitigation measures that have been developed to address significant and potentially significant impacts.
- **Chapter 4, Other CEQA Issues.** This chapter discusses growth-inducing effects, summarizes the cumulative impacts, identifies the significant environmental effects that cannot be avoided if the proposed project is implemented, and significant irreversible changes.
- **Chapter 5, Alternatives.** This chapter describes the alternatives to the proposed project and compares their impacts to those of the proposed project. This chapter also summarizes the alternatives that were considered but rejected from further analysis.
- **Chapter 6, Report Preparers.** This chapter lists the authors of and contributors to this EIR.
- **Appendices A through F.** Six appendices provide information in support of the information presented in the above chapters, including background technical studies prepared for the project.

CHAPTER 2

Project Description

Sections	Figures	Tables
2.1 Introduction	2-1 SqCWD Service Area	2-1 Summary of Existing District-Owned Wells by Service Area
2.2 Project Background	2-2 Existing and Proposed SqCWD Municipal Well Sites	2-2 Demand Projections – Adjusted for Conservation Savings
2.3 Purpose, Need, and Project Objectives	2-3 O'Neill Ranch Well Site Preliminary Site Plan	2-3 Summary of Proposed Wells and Improvements
2.4 Project Description	2-4 Cunnison Lane Well Site Preliminary Site Plan	2-4 Construction Durations
2.5 Project Construction	2-5 Austrian Way Well Site Preliminary Site Plan	2-5 Estimated Construction Waste
2.6 Future Operations and Maintenance	2-6 Granite Way-Aptos Village Well Site Preliminary Site Plan	
2.7 Permits and Approvals	2-7 Polo Grounds Well Site Preliminary Site Plan	
	2-8 Polo Grounds Well Site Preliminary Site Plan – Treatment Facilities	
	2-9 Typical Well Site Facilities	

2.1 Introduction

The Soquel Creek Water District (SqCWD or District) has developed a Well Master Plan (WMP) for the purpose of improving redundancy and flexibility in the SqCWD's water production and distribution system while redistributing pumping away from coastal and depressed groundwater areas. Taking into account current groundwater conditions, the reliability of the existing water system, and the results of a hydrogeologic¹ impact analysis, the WMP calls for: (1) the development of up to four new groundwater production wells at four locations; (2) the conversion of an existing irrigation well to a municipal well; (3) the abandonment and destruction of one deteriorated production well; and (4) the removal of two wells from production and maintenance of those wells as inactive wells. The WMP is designed specifically to be consistent with the management goals and basin management objectives of the *AB 3030 Groundwater Management Plan for the Soquel-Aptos Area* (SqCWD and CWD, 2007) and fulfills the requirements of

¹ Hydrogeology is the science of groundwater occurrence, movement, and quality, and its relationship to the geologic environment.

Element 8 of the plan, which calls for redistributing pumping both vertically and horizontally to achieve more uniform drawdown, reducing susceptibility to seawater intrusion, and minimizing localized pumping depressions.

2.2 Project Background

2.2.1 Overview of the SqCWD

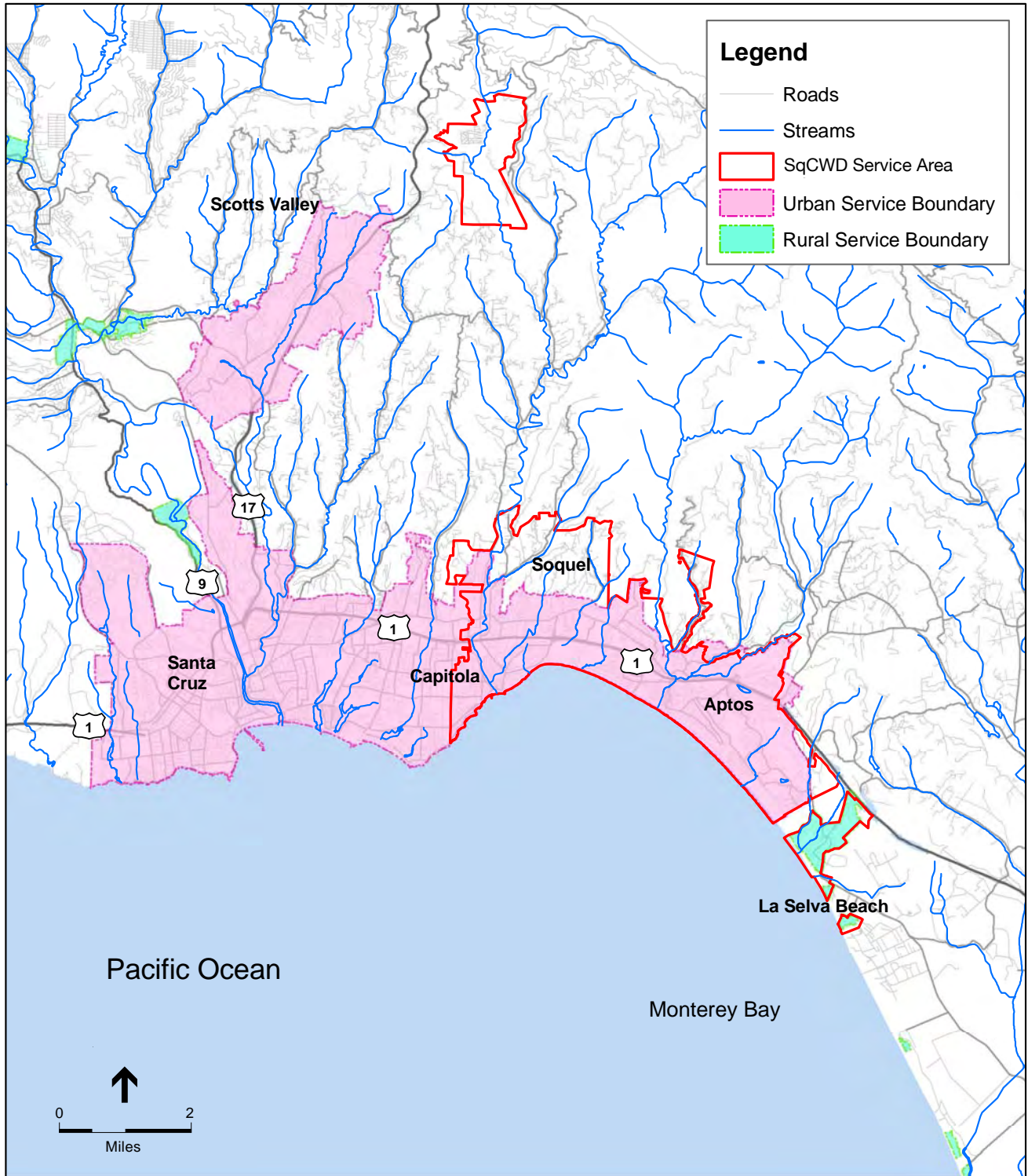
The SqCWD is a nonprofit, local government agency that provides potable water service and groundwater resource management within its service area. Founded in 1961 under the County Water District Law (Water Code, Division 12, Section 30000 et seq.), the SqCWD's original purpose was to provide flood control and water conservation services. In 1964, the SqCWD acquired the Monterey Bay Water Company and discontinued flood control services.

Today, the SqCWD serves a population of about 50,000 through approximately 15,300 service connections in four service subareas (described below) within Santa Cruz County. The SqCWD encompasses seven miles of shoreline along Monterey Bay and extends from one to three miles inland into the foothills of the Santa Cruz Mountains, essentially following the County Urban Services Line (USL) (see **Figure 2-1**). Ninety percent of the SqCWD's customers are residential; the remaining 10 percent are primarily commercial and institutional. There are no agricultural connections to the system. The city of Capitola is the only incorporated area within the District. Unincorporated communities include Aptos, La Selva Beach, Rio Del Mar, Seascapes, Seacliff Beach, and Soquel.

The District currently receives 100 percent of its water from groundwater aquifers in the Soquel-Aptos Groundwater Basin. These aquifers are located within two geologic formations that underlie the SqCWD service area. The Purisima Formation provides the majority of the SqCWD's annual production for Capitola, Soquel, Seacliff Beach, and Aptos (approximately 3,030 acre-feet (ac-ft)). The Aromas Red Sands (Aromas) aquifer provides the remaining water needed annually for the communities of Seascapes, Rio Del Mar, and La Selva Beach (1,830 ac-ft).

The current average annual demand in the District's service area, based on average annual demand from 2005 to 2008, is 4,830 ac-ft (1.57 billion gallons). As a result of ongoing conservation efforts and demand offset programs, the District has effectively reduced average annual demand by approximately 570 ac-ft when compared to average annual demand from 2001 to 2005, which was 5,400 ac-ft (1.76 billion gallons).

In addition to its role as a water purveyor, the SqCWD actively manages groundwater resources in the Soquel-Aptos Groundwater Basin as part of a joint powers agreement with Central Water District (CWD). The policies and practices that constitute SqCWD's current groundwater management program are set forth in the *AB 3030 Groundwater Management Plan for the Soquel-Aptos Area* (SqCWD and CWD, 2007), which established basin management goals and objectives and adopted protocols that promote efficient and effective groundwater management. The District's management of the groundwater basin includes: regular groundwater level and



SOURCE: ESA, 2010.

SqCWD Well Master Plan EIR . 205491

Figure 2-1
SqCWD Service Area

quality monitoring from production wells and dedicated monitoring wells; development and implementation of water conservation and strict demand offset programs; redistribution of pumping to move it inland away from critical coastal areas; and conjunctive use planning. (See Section 2.2.5, below, for a more detailed discussion of groundwater management and planning activities.)

2.2.2 Water Production, Storage, and Distribution Facilities

The SqCWD water supply system consists of 18 production wells (only 16 of which are currently active), approximately 130 miles of pipeline, and 18 water storage tanks. The total estimated production capacity of the system is about 7 million gallons per day (mgd),² and the total storage capacity is 7.5 million gallons. Over time, the District's wells, some of which are 20 to nearly 80 years old, have lost production capacity and have grown increasingly vulnerable to mechanical failure. At least two of these wells (Monterey and Maplethorpe) are at or near the end of their useful operational life. The Aptos Creek Well has severe age and structural issues and is no longer reliable. Other wells (Estates, Madeline, and T. Hopkins) can only be operated for limited periods during the summer season as the pumps break suction after prolonged pumping.

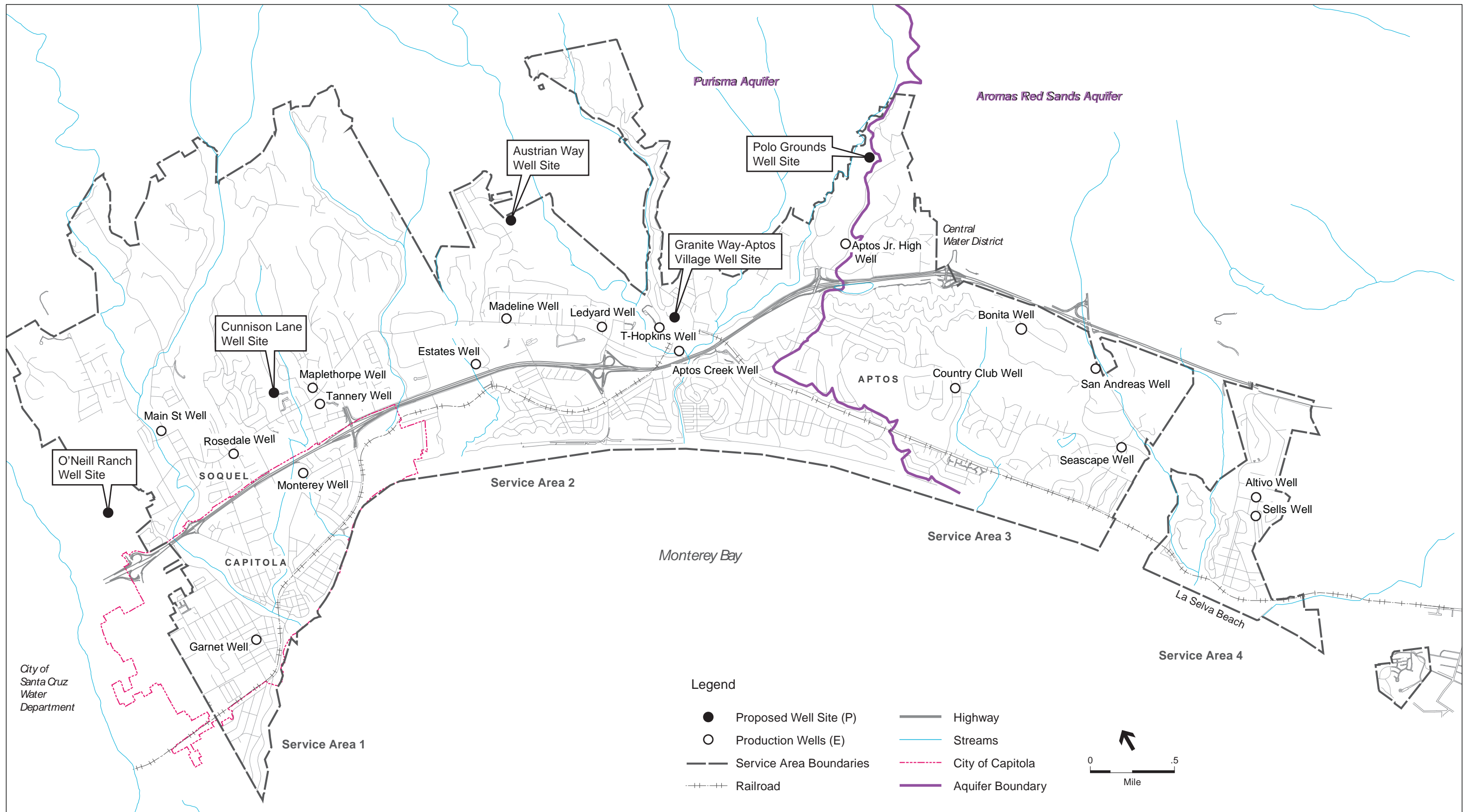
The SqCWD water production, storage, and distribution system is operated within four individual water service areas that are herein referred to as Service Areas I, II, III, and IV (see **Figure 2-2**). These service areas, which were originally privately owned water systems, were consolidated and combined to form the SqCWD. Service Areas I and II are intertied by the McGregor Drive Transmission Line; Service Areas III and IV are intertied by the San Andreas Road Transmission Line. Although interconnections between Service Areas I and II and between Service Areas III and IV allow for some movement of water between service areas, the transfer of water between Service Areas I and II east to Service Areas III and IV is not currently possible. **Table 2-1** summarizes the existing District-owned wells by service area.

Service Area I

Service Area I encompasses most of Capitola and Soquel. Service Area I contains six production wells, four water storage tanks, two booster pump stations, and five treatment plants. As indicated in Table 2-1, four of these wells (Garnet, Main Street, Rosedale, and Tannery II) are currently in production; two of these wells (Monterey and Maplethorpe) have been taken out of service. All wells in Service Area I draw water from the Purisima Formation. The total source capacity³ of the wells in Service Area I is estimated at 3,703 gallons per minute (gpm). 500 gpm produced by wells located in Service Area I is transferred to Service Area II to augment supplies. Thus, the total adjusted source capacity of Service Area I is estimated at 3,203 gpm.

² The total estimated annual production capacity is calculated based on the maximum instantaneous pumping rates and the assumption that each well operates 50 percent of the time.

³ Source capacity represents the best estimate of the capacity of all production wells in a particular area (e.g., a service area) over an extended period of time.



SOURCE: Soquel Creek Water District, 2006

SqCWD Well Master Plan EIR.205491

Figure 2-2
Existing and Proposed
SqCWD Municipal Well Sites

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**TABLE 2-1
SUMMARY OF EXISTING DISTRICT-OWNED WELLS BY SERVICE AREA**

Well Name	Well Location	Year Drilled	In Production?	Condition	Instantaneous Pumping Rate (gpm)
Service Area I					
Garnet	Garnet Street / 49th Avenue	1995	Yes	Good	712
Main Street	Main Street / Bridge Street	1986	Yes	Good	1,181
Rosedale	Rosedale Avenue / Soquel Drive	1983	Yes	Good	850
Tannery II	Maplethorpe Lane / Soquel Drive	2004	Yes	Good	960
Maplethorpe	Maplethorpe Lane / Soquel Drive	1965	No	Inactive	0
Monterey	Monterey Avenue / Kennedy Drive	1950	No	Inactive	0
Service Area I – Total Well Capacity =					3,703
Minus Transfer to Service Area II					- 500
Service Area I – Total Source Capacity (adjusted) =					3,203
Service Area II					
Ledyard	Ledyard Way / Arden Way	1985	Yes	Good	178
Madeline	Madeline Drive / Soquel Drive	1984	Yes	Impaired ^a	221
Estates	Estates Drive / Borregas Drive	1985	Yes	Impaired ^a	718
T. Hopkins	Village Creek Road / Aptos Creek Road	1989	Yes	Impaired ^a	225
Aptos Creek	Spreckles Drive / Seacliff Drive	1965	Yes	Impacted	400
Service Area II – Total Well Capacity =					1,742
Plus Transfer from Service Area I					+ 500
Service Area II – Total Source Capacity (adjusted) =					2,242
Service Area III					
Bonita	Bonita Drive / Zanzibar Drive	1983	Yes	Good	810
Country Club	Baltusrol Drive / Baltusrol Way	1953	Yes	Good	371
San Andreas	San Andreas Road / Bonita Drive	1991	Yes	Good	992
Seascape	Seascape Ridge Drive / Camino Pacifico	1981	Yes	Impaired ^a	772
Aptos Jr. High	N. Polo Drive / S. Polo Drive	1927	Yes	Good	407
Service Area III – Total Well Capacity =					3,352
Minus Blending to Service Area IV					-100
Service Area III – Total Source Capacity (adjusted) =					3,252
Service Area IV					
Altivo	Altivo Avenue / Mar Monte Avenue	1979	Yes	Impaired ^b	614
Sells	Sells Drive / San Andreas Road	1983	Yes	Impaired ^{b,c}	529
Service Area IV – Total Well Capacity =					1,143
Blending from Service Area III					+ 100
Service Area IV – Total Source Capacity (adjusted) =					1,243

KEY: Good = reliable capacity, produces acceptable water quality; Impacted = well no longer maintains historic pumping capacities through prolonged pumping cycles during periods of high demand, or is prone to failure due to holes in the well casings and associated production of sand and gravel; Impaired = well is located in an area vulnerable to seawater intrusion and/or other groundwater management or water quality issues that restrict well production.

NOTES:

^a Pumping reduced due to advancement of freshwater/seawater interface (i.e., seawater intrusion) or lowered local groundwater levels that cause the well to break suction after prolonged pumping.

^b Well production is limited due to a policy decision to blend water from Service Area III to reduce chromium VI levels.

^c Well has elevated nitrate levels.

SOURCES: SqCWD, 2006a; SqCWD, 2006b; HydroMetrics, 2009.

The Maplethorpe Well was taken out of production in the mid-1990s due to excess sand production and turbidity as well as loss of production capacity. This well is not considered part of the total source capacity of the system. The well is located across the street from the Tannery Treatment Plant and the new Tannery II Well and is plumbed to pump raw water to the Tannery Treatment Plant. The Maplethorpe Well site is not suitable for a replacement well because space constraints and inadequate treatment capacity preclude the possibility of installing another well at the same location.

The Monterey Well was taken out of production in 2005 due to loss of suction during prolonged periods of pumping and increased sand production.⁴ In 2005, a PVC liner with pre-packed gravel was inserted into the Monterey Well in an effort to rehabilitate it. Acid treatments were also used in an attempt to dissolve the old stove-pipe casing. Efforts to rehabilitate the well have been unsuccessful. Due to space constraints, the potential for a replacement well at the same site is very limited. Additionally, this well is located two blocks away from the ocean and is in the coastal area.⁵ Although inactive, the Monterey Well is currently an emergency standby well and is operated only when needed to meet demand because other wells are temporarily unavailable due to mechanical failure, water quality issues, or routine maintenance.

The Garnet, Main Street, Rosedale, and Tannery II Wells produce water for all of Service Area I and for some of Service Area II. All four active well sites in Service Area I have onsite treatment plants. Raw water pumped from wells in Service Area I is chlorinated and treated to remove iron and manganese prior to distribution.⁶

Collectively, the four water storage tanks in Service Area 1 (Cornwell, Pringle, Crestline No. 1, and Crestline No. 2) provide 2,000,000 gallons of storage capacity. Water levels in the District's tanks are controlled via radio signals using a Supervisory Control and Data Acquisition (SCADA) system. When water levels in the storage tanks are low, a radio signal is sent to the well pumps to turn on; when the storage tanks are full, a radio signal is sent to the well pumps to shut down before the storage tank reaches overflow elevation. Once filled, the storage tanks are able to deliver water to most customers in the service area by gravity flow.

At the Cornwell Booster Pump Station, four booster pumps and one fire pump convey water stored in the Cornwell Tank to the Sea Crest and Hilltop subdivisions. These are pressurized booster pump systems that operate on flow and pressure and deliver water to homes located too high above the storage tank to be served by gravity flow. A fifth booster pump station, the Maplethorpe Booster Pump Station, pumps water from Service Area I to storage tanks in Service Area II (Fairway and Austrian Tanks).

⁴ Sand production occurs when sand is drawn into the well through the perforations in the well casing. The perforations are the slits cut into the well casing to allow groundwater to enter the well. Once inside the well casing, the sand can block the well screen, damage the well pump, increase well drawdown, and perhaps even accelerate corrosion and encrustation.

⁵ For the purposes of this EIR, the coastal area refers to the interface between the land and the sea, where groundwater quality is most easily influenced by seawater. The coastal area extends from the shoreline about one-half mile inland. Highway 1 is the boundary line for the coastal area.

⁶ Wells drilled in the Purisima Formation require iron and manganese removal to meet secondary drinking water standards of 0.3 mg/L for iron and 0.05 mg/L for manganese.

Service Area II

Service Area II, which serves the greater Aptos area, has five active production wells, two treatment plants, six storage tanks, and three booster pump stations. All wells in Service Area II draw water from the Purisima Formation. Although the five wells in Service Area II (Ledyard, Madeline, Estates, T. Hopkins, and Aptos Creek) are active, the Aptos Creek Well has age and structural issues and is no longer reliable, and the Madeline, Estates, and T. Hopkins Wells are considered impaired due to loss of suction during prolonged pumping. It is not desirable to drill a replacement well at the Aptos Creek Well site due to the presence of low levels of naturally occurring arsenic, space constraints, the close proximity to Aptos Creek, and the fact that SqCWD does not own the property. The 1,742 gpm produced by wells located in Service Area II is augmented by approximately 500 gpm that is transferred from Service Area I. Thus, the adjusted total source capacity for Service Area II is estimated at 2,242 gpm.

The Estates and T. Hopkins Well sites have onsite treatment plants. The Estates Treatment Plant is an iron and manganese removal plant that treats raw water from the Estates Well; the T. Hopkins Treatment Plant removes iron, manganese, and arsenic from water produced by the T. Hopkins and Aptos Creek Wells. Water produced at the Madeline and Ledyard Wells is below the secondary drinking water standards for iron and manganese, and thus does not require treatment.

Together, the six storage tanks in Service Area II (Austrian, Park Wilshire, Fairway, Mar Vista No. 1, Mar Vista No. 2, and Ironwood) provide 2,015,000 gallons of storage. A booster pump station at the Mar Vista Tank site pumps water up to the booster pump station located at the Austrian Way tank site, which in turn pumps water up to the Park Wilshire Tank. A pressure-reducing valve at Shore Trails, located between Seaview Drive and Beach Drive at the coast, enables the District to transfer water supplies from Service Area III to Service Area II.

Service Area III

Service Area III includes the communities of Rio Del Mar and Seascape and a portion of Aptos. Service Area III consists of five production wells, four water storage tanks, and five booster pump stations. An average of 100 gpm of water produced by wells in Service Area III is transferred to Service Area IV for blending (see the discussion for Service Area IV, below). The total source capacity of production wells in Service Area III, minus the approximately 100 gpm transfer to Service Area IV, is estimated at 3,252 gpm.

The active production wells in Service Area III are known as Bonita, Country Club, San Andreas, Seascape, and Aptos Jr. High. Except for the Aptos Jr. High Well, which draws water exclusively from the Purisima Formation, active production wells in Service Area III are completed in the Aromas aquifer and the shallowest unit of the Purisima Formation. The Country Club and Aptos Jr. High Wells are 53 and 79 years old, respectively. The Aptos Jr. High Well, which was previously removed from service due to poor water quality, was rehabilitated in 2007 following construction of the Aptos Jr. High Treatment Plant and water produced from this well is treated for arsenic, iron, and manganese. The Aptos Jr. High Treatment Plant is the only treatment plant

in Service Area III.⁷ The Bonita, Country Club, San Andreas, and Seascope Wells have detected levels of hexavalent chromium (chromium VI) at concentrations below the current California Maximum Contaminant Level (MCL)⁸ for total chromium.

Collectively, the Vista Del Mar, Seascope, Rio Del Mar, and Monte Toyon Tanks have a water storage capacity of 2,250,000 gallons. Booster pump stations are located at Vista Mar Court, Aptos Jr. High Well site, Seascope Tank site, Vista del Mar Tank site, and Monte Toyon Tank site.

Service Area IV

Service Area IV serves the community of La Selva Beach. This service area has two production wells (Sells and Altivo), four water storage tanks (Canon del Sol, Larkin Valley, Aqua View No. 1, and Aqua View No. 2), and one booster pump station. Both wells in Service Area IV draw water from the Aromas aquifer. Including the approximately 100-gpm transfer from Service Area III, the total source capacity of Service Area IV is 1,243 gpm. The total storage capacity in Service Area IV is 1,260,000 gallons. The booster pump station is located at the Aqua View Tank site and boosts water from Aqua View Tanks No. 1 and No. 2 to the Larkin Valley Tank.

Due to the presence of hexavalent chromium (chromium VI) in production wells in the La Selva Beach area, water from Service Area IV is blended with water from Service Area III to reduce chromium VI concentrations. Prior to blending, however, water produced from Service Area IV wells is below the current California MCL for total chromium. Drinking water quality is discussed further in Section 3.3, Groundwater Resources.

2.2.3 Projected Water Demand

The long-term planning horizon for the District's water demand projections is based on buildout of the current Santa Cruz County (1994) and Capitola (2004) General Plans. The water demands associated with developable lands (for the years 2010 and 2020) were determined using a land use analysis. Development data were provided by the County and the City of Capitola for lands within the Urban Services Line (USL). Demands beyond 2020 were assumed to parallel the Association of Monterey Bay Area Governments' (AMBAG) population projections for the census tracts within the SqCWD service area. The District's water demand projections were revised in April 2009 using the methodology used in the *2006 Integrated Resources Plan* (SqCWD, 2006c) to reflect lower than projected demand and water efficient technology used in new development. The revised projections of demand at buildout average 6,625 acre-feet per year (ac-ft/yr) and range from 6,210 to 7,040 ac-ft/yr.⁹ Buildout is expected to occur in 2050 (SqCWD, 2009).

The SqCWD's future water demand projections consider the impact of reasonable/achievable conservation efforts on future water use. The projections for conservation savings are based on achievable interior and exterior use reductions for each customer class (i.e., residential, commercial,

⁷ Wells in the Aromas aquifer do not require treatment for removal of iron and manganese.

⁸ MCLs are enforceable standards that correlate to the highest level of a contaminant that is allowed in drinking water.

⁹ The low and high demand projections are based on the range of potential development density (housing units per acre) assigned to each land use type by the Santa Cruz County General Plan.

etc.). Conservation savings of approximately 730 ac-ft are expected for the year 2010, based on average demand. By 2050, savings are expected to reach about 950 ac-ft/yr (SqCWD, 2009). The demand projections, adjusted for conservation savings, are shown in **Table 2-2**.

TABLE 2-2
DEMAND PROJECTIONS – ADJUSTED FOR CONSERVATION SAVINGS (acre-feet per year)

	2000	2010	2015	2020	2030	2040	2050
High/Low Demand ^a	n/a	5,550/5,510	5,780/5,679	6,010/5,820	6,340/5,950	6,680/6,070	7,040/6,210
Average Demand ^b	5,463 (actual)	5,530	5,725	5,915	6,145	6,375	6,625
Conservation Savings ^c	–	(730)	(814)	(899)	(910)	(930)	(950)
Adjusted Average Demand	5,463	4,800	4,911	5,016	5,235	5,445	5,675

^a The low and high demand projections are based on the range of potential development density (housing per acre) assigned to each land use type by the Santa Cruz County General Plan.

^b Average demand equals high demand plus low demand divided by two.

^c Conservation programs initiated by the District in 2002 are anticipated to result in a decrease in adjusted demand until 2010.

SOURCE: SqCWD, 2009.

2.2.4 Current Groundwater Conditions

The SqCWD currently derives 100 percent of its water supplies from local groundwater resources in the Soquel-Aptos Groundwater Basin. The Purisima Formation and Aromas aquifer are the two primary water-bearing geologic formations underlying the SqCWD. The SqCWD has been monitoring groundwater levels and groundwater quality in the Purisima Formation and Aromas aquifer since the 1980s. Groundwater monitoring allows the District to evaluate groundwater trends and the potential impact of local and regional pumping with respect to overdraft, seawater intrusion, and groundwater quality. Seawater intrusion, defined as the mixing of seawater and fresh groundwater in an aquifer, occurs when groundwater levels along the coast are depressed to the point that seawater moves inland into the aquifer.

Hydrogeologic studies in the vicinity of the SqCWD service area indicate that groundwater extractions by public and private production wells in proximity to the coast have had the cumulative impact of lowering water levels sufficiently to induce seawater intrusion. Groundwater monitoring results indicate a landward movement of the freshwater/seawater interface¹⁰ along the southern coast of the District boundary in the Aromas aquifer. Furthermore, although monitoring within the Purisima Formation shows no definitive signs of active seawater intrusion, there is concern that

¹⁰ The seawater/freshwater interface is the groundwater zone along the coastal margin where fresh groundwater and seawater meet. Water in this zone is brackish. Aquifers that are not actively pumped provide a certain amount of freshwater outflow at the coast. Because this outflow exerts seaward hydraulic pressure, it holds seawater at equilibrium offshore from the coast and hinders its onshore advancement.

seawater may leak into the deep layers of the Purisima Formation aquifers along the western and central coast of the District boundary.

As the largest single groundwater producer in the Soquel/Aptos area, the SqCWD implements numerous groundwater protection measures and conservation programs to limit its groundwater pumping to within sustainable levels (discussed in Section 2.2.5, below). Despite these measures, the District's current well configuration has resulted in less than ideal groundwater conditions throughout the SqCWD service area that could be partially remedied by implementing the WMP. Significant pumping troughs and the threat of seawater intrusion are unfortunate consequences of the current pumping system (SqCWD and CWD, 2007). Currently, during peak demand summer months, SqCWD must operate active wells for extended periods of up to 24 hours per day. The current well configuration limits the SqCWD's ability to redistribute pumping and reduce the duration of pumping from individual wells, resulting in a chronic pumping trough in the Purisima Formation. Water levels in this pumping trough are consistently below sea level. This trough also increases the costs of pumping by increasing the required lift, limits the pumping rates by limiting the amount of drawdown available in wells, and induces seawater intrusion. The pumping trough could be ameliorated by a wider areal and vertical distribution of pumping, and a more balanced, regional drawdown.

Seawater intrusion can severely impair the quality of groundwater and cannot readily be reversed. Reversing seawater intrusion requires that coastal groundwater levels be sufficiently raised to re-establish a positive offshore gradient. Even after a positive offshore gradient is achieved, reversing seawater intrusion can be very difficult and slow to achieve. Consistent with the *AB 3030 Groundwater Management Plan for the Soquel-Aptos Area*, one of the goals of the WMP is to give SqCWD the ability to more uniformly extract groundwater throughout the Soquel-Aptos area and minimize the potential for seawater intrusion along the coast. These goals and objectives are discussed further in Section 2.3, below.

2.2.5 Groundwater Management

On average, the SqCWD must limit groundwater pumping to no more than 4,800 ac-ft/yr in order to maintain the pumping goal established for the District in the *AB 3030 Groundwater Management Plan for the Soquel-Aptos Area* (SqCWD and CWD, 2007). The pumping goal is based on an estimation of the long-term sustainable yield¹¹ of the Soquel-Aptos Groundwater Basin. The pumping goal of no more than 4,800 ac-ft/yr on average for SqCWD accounts for current pumping from non-SqCWD water wells in the basin. The current average annual demand in the District's service area, based on average annual demand from 2005 to 2008, is 4,830 ac-ft (1.57 billion gallons). As a result of ongoing conservation efforts and demand offset programs, the District has effectively reduced its average annual demand by approximately 570 ac-ft when compared to average annual demand from 2001 to 2005, which was 5,400 ac-ft (1.76 billion gallons), but has no control over non-SqCWD wells in the basin.

¹¹ Sustainable yield refers to the amount of groundwater that can be pumped from an aquifer on a long-term basis without negative impacts to groundwater quantity or quality, and without creating an undesired effect such as subsidence or reduced baseflow in nearby streams.

The SqCWD is proactive in managing its use of the Soquel-Aptos Groundwater Basin through regular groundwater level and quality monitoring from production wells and dedicated monitoring wells; development and implementation of water conservation and strict demand offset programs; redistribution of pumping to move it inland away from critical coastal areas; and conjunctive use planning.

- **Groundwater Monitoring.** Groundwater levels and quality are monitored with a network of dedicated monitoring wells operated by SqCWD, Central Water District (CWD), and Santa Cruz Water Department (SCWD). The monitoring network focuses on the coast, but also includes inland wells and is specifically designed to identify trends and changes in groundwater elevations and quality.
- **Conservation and Demand Offset.** Since 1997, SqCWD has adopted numerous conservation programs including a tiered rate structure, rebates on water-efficient appliances, indoor and outdoor water use surveys, extensive public outreach, school education, and a strict water demand offset program that requires new development to “offset” or neutralize its projected water use.
- **Pumping Redistribution.** SqCWD has historically modified its pumping distribution to help control seawater intrusion and minimize well interference. SqCWD’s ability to redistribute pumping is limited by the fact that its existing wells are heavily concentrated along the coast. Implementation of the WMP would enable SqCWD to redistribute pumping inland and away from the critical coastal areas as well as to reduce pumping depressions at specific locations.
- **Conjunctive Use Planning.** Conjunctive use planning efforts are currently focused on the scwd² Seawater Reverse Osmosis Cooperative Desalination Program. The program involves constructing a 2.5-million-gallon-per-day (mgd) ocean water desalination plant in Santa Cruz to be shared between the District and SCWD. SqCWD would operate the desalination plant to alleviate pumping demands in the Soquel-Aptos area during normal and wet years as well as off-peak periods in drought years. In dry years from May through October, SqCWD would rely on existing groundwater supplies, and the SCWD would operate the desalination plant to supplement its surface water supplies. (See the discussion of the *2006 Integrated Resources Plan*, below, for additional discussion regarding conjunctive use planning and supplemental water supplies.)

2006 Integrated Resources Plan

The SqCWD prepared the *2006 Integrated Resources Plan* for the purpose of addressing issues associated with depressed groundwater levels and the threat of seawater intrusion into coastal aquifers (SqCWD, 2006c). The *2006 Integrated Resources Plan* describes the current knowledge and understanding of SqCWD’s groundwater supplies and presents a long-term action plan to guide groundwater protection and water supply planning efforts. The future water demand projections presented in the *2006 Integrated Resources Plan* were updated by the District in April 2009 to account for actual average annual water use between 2005 to 2008; however, the individual plan components developed specifically for the purpose of assuring a safe and reliable water supply for SqCWD customers while preventing further degradation of local groundwater and surface water resources and enabling coastal groundwater levels to recover to levels protective against seawater intrusion are still relevant.

Based on the District's pumping goal established in the *AB 3030 Groundwater Management Plan for the Soquel-Aptos Area*, which is currently, on average, no more than 4,800 ac-ft/yr, and the adjusted average water demand for 2050 of 5,675 ac-ft/yr, the SqCWD's estimated supply shortfall at buildout is 875 ac-ft/yr. The *2006 Integrated Resources Plan* provides a portfolio of additional conservation and supplemental water supply options to address both the groundwater overdraft conditions and annual supply shortfalls. The individual options will be implemented, as necessary, based on changing demand and water supply conditions in the SqCWD's service area. Each of the supplemental supply options would be required to undergo a separate project-level environmental review prior to implementation. In the event that none of the water supply options presented in the *2006 Integrated Resources Plan* are developed and the District does not have a supplemental supply available to make up the difference between the District's pumping goal and demand, and if groundwater monitoring data were to demonstrate continued groundwater overdraft caused by exceeding the sustainable yield of the groundwater basin, the District has the legal authority to declare a water supply emergency and impose restrictive water rationing to curtail water use and maintain groundwater pumping within sustainable levels until sufficient supply is developed (see the discussion under the heading *Water Supply Emergency Response Plan*, below).

Summary of Supplemental Supply Options

- **Regional Desalination.** The scwd² Seawater Reverse Osmosis Cooperative Desalination Program is a joint effort between the City of Santa Cruz Water Department (SCWD) and SqCWD in the evaluation and potential development of a regional desalination plant in Santa Cruz. As proposed, SqCWD would use the plant to augment groundwater supplies during normal and wet years and from November through April of drought years; the Santa Cruz Water Department would use the plant during drought periods when surface water supplies are limited (scwd², 2010). If the project progresses as planned, SqCWD will have guaranteed access to a minimum of 1,158 ac-ft/yr of supplemental supply by 2015, and additional supply available during non-drought periods when the SCWD does not claim its full allocation. If regional desalination is unsuccessful, SqCWD will need to implement an alternate supplemental water supply project, such as local-only desalination or a Soquel Creek winter diversion.
- **Local-Only Desalination.** SqCWD has conducted preliminary feasibility studies for a local-only desalination system on the beachfront areas within its service area to draw seawater. Further investigation of permitting issues, hydrogeologic constraints, erosion risks, and maintenance requirements is necessary to determine if this is a viable option. If feasible and economically viable, the project could be implemented between 2015 and 2020 (SqCWD, 2006d).
- **Soquel Creek Winter Diversion.** SqCWD has studied the potential for diverting water from Soquel Creek during peak flow periods (primarily winter months). During periods when diverted flows exceed demand in the water distribution system, the water would be injected into the local aquifer for artificial recharge of the groundwater basin. This option includes the construction of a 2.5-mile pipeline to deliver diverted and treated water to SqCWD's distribution system as well as the construction of nine new injection wells (SqCWD, 2006c).

Opportunities for Enhancing In-Lieu Groundwater Recharge

The 2006 *Integrated Resources Plan* identifies development of site-specific recycled water supplies for large scale irrigation use to offset overall basin demand for potable water supplies. SqCWD recently completed a planning study to evaluate the feasibility of providing recycled water to certain parks and the golf course within its service area, which are near sewer mains with potentially sufficient flow to produce an adequate source of recycled water (Black & Veatch, 2009). Since the candidate properties for recycled water are served by their own irrigation wells, the SqCWD's projected water demand would not change with recycled water use. However, reduced pumping from irrigation wells would provide in-lieu recharge of the groundwater basin (SqCWD, 2006c).

Groundwater Management Plan for the Soquel-Aptos Area

The SqCWD also manages groundwater resources within the Soquel-Aptos Groundwater Basin in accordance with a joint powers agreement with Central Water District (CWD). The policies and practices that constitute SqCWD's current groundwater management program are set forth in the *AB 3030 Groundwater Management Plan for the Soquel-Aptos Area* (SqCWD and CWD, 2007). The plan, which was updated in April 2007, established basin management goals and objectives and adopted protocols that promote efficient and effective groundwater management. These objectives are supported by a series of specific elements that define projects, programs, and policies that will be implemented as part of the groundwater management plan. A brief summary of goals and objectives is provided below.

- **Goal 1: Ensure Water Supply Reliability for Current and Beneficial Uses.** One of the primary goals of the management strategy is to ensure that adequate water supplies are available to meet residential, commercial, institutional, agricultural, and fire suppression uses within the SqCWD and CWD service areas. The specific basin management objectives for ensuring water supply reliability are to: pump within the sustainable yield of the basin; develop alternative water supplies to achieve a long-term balance between recharge and withdrawals to meet current and future demand; and manage groundwater storage for future beneficial uses and drought reserve.
- **Goal 2: Maintain Adequate Water Quality.** This goal is aimed at maintaining water quality to meet current and future beneficial uses of groundwater resources in the Soquel-Aptos Groundwater Basin. The specific basin management objectives are to: meet existing water quality standards for beneficial uses, such as drinking water standards; maintain groundwater levels to prevent seawater intrusion; and prevent and monitor contaminant pathways.
- **Goal 3: Prevent Adverse Environmental Impacts.** This goal aims to prevent adverse environmental impacts on riparian and aquatic ecosystems. The specific basin management objectives are to: maintain or enhance the quantity and quality of groundwater recharge by participating in land use planning processes; avoid alteration of stream flows that would adversely impact the survival of populations of aquatic and riparian organisms; and protect the structure and hydraulic characteristics of the groundwater basin by avoiding withdrawals that cause subsidence.

Urban Water Management Plan Update 2005

In accordance with the Urban Water Management Planning Act of 1983, the District regularly (every five years) updates its Urban Water Management Plan (UWMP). UWMPs are required to describe and evaluate existing and planned sources of water supply, discuss the reliability of the water supply with respect to seasonal or climatic shortages, and describe demand management measures to be implemented by the water supplier. The *2005 Soquel Creek Water District Urban Water Management Plan* includes a Water Supply Emergency Response Plan that details the actions that would be taken by the SqCWD in the event of a water supply emergency, including a groundwater emergency due to groundwater overdraft.

Water Supply Emergency Response Plan

Ongoing pumping in excess of the sustainable yield of the Soquel-Aptos Groundwater Basin has the potential to result in a combination of chronically depressed coastal groundwater levels, reversed seaward gradients, and degraded groundwater quality that collectively define seawater intrusion. Although the District has not experienced any water shortages on a regular annual, monthly, or peak period basis, if groundwater monitoring data were to demonstrate that a groundwater overdraft exceeding the sustainable yield of the groundwater basin threatens the public health, safety, and welfare of the community, the District is required to declare a groundwater emergency and implement its Water Supply Emergency Response Plan, which calls for progressively more restrictive water rationing and water use curtailment by District customers. Mandatory water rationing and water use curtailment could be triggered during: (a) long-term droughts if a supplemental water supply is not available and it is determined that adverse groundwater conditions would be exacerbated by continued pumping at the current levels (i.e., drought emergency), or (b) non-drought periods if groundwater overdraft lowers groundwater levels such that there is a reduction in total production capacity that jeopardizes the District's ability to meet normal demand (i.e., water supply emergency). The Water Supply Emergency Response Plan, coupled with ongoing groundwater monitoring efforts, is aimed at preventing adverse groundwater effects from groundwater pumping by the District and other users in the Soquel-Aptos Groundwater Basin (SqCWD, 2005).

2.2.6 Previous Lawsuits

In attempts to regain lost capacity and redistribute pumping away from the coastal area, the SqCWD separately and consecutively pursued the development of two new wells (Suncatcher and O'Neill Ranch Wells) in the vicinity of 41st Avenue and Soquel Drive. The Initial Study/Mitigated Negative Declarations (IS/MNDs) prepared individually for the Suncatcher (Pacific Municipal Consultants, 1998) and O'Neill Ranch Wells (SqCWD, 2001) were legally challenged for the reasons summarized below.

Suncatcher Well IS/MND

In 1998, the SqCWD prepared an Initial Study/Mitigated Negative Declaration (IS/MND) for the Suncatcher Court Well and Treatment Plant Project, which was to be constructed for the purpose

of redistributing groundwater withdrawals areally and vertically and allowing other wells to be run for shorter periods. The IS/MND for this project was legally challenged in *Topsail Court Homeowners Association vs. County of Santa Cruz and SqCWD*. The plaintiff, Topsail Court Homeowners Association, sought an order from the court to prohibit the SqCWD from constructing the Suncatcher Well and water treatment facility on the grounds that the proposed land use was in violation of local zoning ordinances. Topsail's petition was denied, and the court determined that the SqCWD's proposed well and treatment facility was exempt from building and zoning ordinances under Government Code Section 53091. That determination was ultimately confirmed on appeal in February 2005.

Due to the project delays and neighborhood opposition to the Suncatcher Court Well, the District decided to pursue a different well site and thereby prepared an IS/MND for the O'Neill Ranch Well site.

O'Neill Ranch Well IS/MND

In 2001, the SqCWD prepared an IS/MND for the purpose of redistributing pumping and replacing the failing Maplethorpe Well with a new production well (O'Neill Ranch Well). The *O'Neill Ranch Well IS/MND* was legally challenged in *Save the Habitat vs. SqCWD*.

The plaintiff, Save the Habitat, advanced two arguments against the IS/MND. Save the Habitat alleged that, because the replacement well was to be equipped with a larger pump than the original well, an increase in the ability of the system to pump water from the groundwater basin would result, and the new well therefore, could not be considered a replacement well. Save the Habitat further alleged that a pumping increase from the groundwater aquifer could reduce baseflow¹² in local creeks. The court's judgment resulted in a writ of mandate compelling the District to rescind its approval of the IS/MND and of the project and directed preparation of an Environmental Impact Report (EIR) to evaluate the potential impacts on streamflow and cumulative groundwater impacts raised in the lawsuit.

2.3 Purpose, Need, and Project Objectives

The overall goals of the WMP are to secure a reliable groundwater supply by improving redundancy and flexibility in the system and redistributing pumping away from the coastal area, and to provide a more uniform drawdown of the groundwater basin. As discussed above, historical groundwater monitoring data in the Soquel-Aptos Groundwater Basin indicate that groundwater extractions by public and private production wells in proximity to coastal areas have had the cumulative impact of lowering water levels sufficiently to induce seawater intrusion. Redistributing pumping areally and adding sufficient flexibility in the District's well fields would limit the duration of pumping from individual wells, thereby reducing interference between wells, achieving a more balanced, regional drawdown, and reducing the vulnerability to seawater intrusion.

¹² Baseflow is water that flows from groundwater into the streambed.

The current well configuration and deteriorating condition of many of the District's wells significantly limit the District's ability to redistribute pumping. Several of the District's wells are old and are fast approaching their operational lifespan. Replacement wells on the same sites are infeasible due to space constraints and/or limited treatment capacity, or are undesirable in terms of groundwater management. Attempts to refurbish wells and restore adequate production capacities have been generally unsuccessful. Previous efforts by the SqCWD to develop new wells individually have been legally challenged, in part for taking a "piecemeal" approach to groundwater management.

Implementation of the WMP would give SqCWD a sufficient number of strategically placed wells to provide the redundancy and flexibility needed to redistribute its pumping away from the coastal area and better balance groundwater levels throughout the SqCWD service area through the ability to shift pumping both horizontally and vertically. Distributing pumping areally and adding sufficient flexibility to limit the duration of pumping on individual wells would reduce interference between wells. Groundwater level recovery within the pumping trough could be achieved with a more balanced, regional drawdown. Increased vertical distribution of pumping could also reduce the impacts of localized pumping troughs by taking advantage of the fairly well-confined aquifers in the Purisima Formation. The impacts in overlying and underlying aquifers are less than the impact in the pumped aquifer; thus, wells could be designed to pump from specific aquifers, reducing the impact on more vulnerable aquifers.

The WMP allows for a comprehensive approach in addressing groundwater supply availability and distribution, groundwater management, and the collective effect of WMP components on local resources. The specific objectives of the WMP are to:

- Meet the basin management objectives of uniform drawdown of the aquifers and redistribution of pumping away from coastal areas to reduce susceptibility to seawater intrusion
- Limit the typical pumping duration of any given well to less than 12 hours per day in order to maintain sufficient local groundwater levels for effective well operation and to manage the depth and radius of residual pumping depressions
- Ensure a reliable water supply when individual wells are out of service due to maintenance, mechanical failure, or damage
- Have adequate system capacity and flexibility to respond to peak, maximum-day demand in all four service areas

2.4 Project Description

2.4.1 WMP Overview

The WMP calls for: (1) the development of up to four new groundwater production wells at four locations (O'Neill Ranch, Cunnison Lane, Austrian Way, and Granite Way-Aptos Village Well sites); (2) the conversion of an existing irrigation well to a municipal well (Polo Grounds Well); (3) the abandonment and destruction of one deteriorated production well (Monterey Well); and

(4) the removal of two wells from production and maintenance of those wells as inactive wells (Maplethorpe Well, and either T. Hopkins Well or Aptos Creek Well, depending on the performance of these wells when the proposed Granite Way-Aptos Village Well comes online). Although it is possible that only three new groundwater production wells would be constructed, this EIR presents a project-level evaluation of all four new wells. This EIR also evaluates the conversion of the Polo Grounds Well to a municipal well, proposed changes in operating scenarios, proposed changes in status of certain existing wells, and the destruction of the Monterey Well. All of the proposed production wells would be completed in the Purisima Formation, which would require treatment for iron and manganese.¹³ Some infrastructure improvements would be necessary to connect the new wells to the existing conveyance system. Proposed well site characteristics are summarized in **Table 2-3**.

The proposed wells would restore lost capacity of the water supply system and would enable the District to shift pumping away from impaired areas. The goal of the WMP is not to increase total production in the system, but rather to improve the management of existing groundwater resources by making the necessary improvements to the system's aging infrastructure. Thus, implementation of the WMP would not translate to a long-term increase in pumping from the groundwater basin. Indeed, as presented above in Section 2.2.3, the District's demand projections to 2010 show declining demand due to conservation. As described in the SqCWD's 2005 *Urban Water Management Plan* (SqCWD, 2005) and 2006 *Integrated Resources Plan* (SqCWD, 2006c); the long-term goal is to limit average groundwater production to no more than 4,800 ac-ft/yr and to meet demand with a supplemental supply source. Restoring and improving the system's pumping capacity would not translate into increased production from the Purisima Formation, but would enable the District to adequately respond to peak, maximum-day demand in all four service areas, improve operational flexibility, reduce pumping durations for individual wells, and reduce the stress placed on any one well. Furthermore, because groundwater production wells lose capacity over time, it is assumed that the initial capacity of new wells would gradually decline, particularly in the Purisima Formation, where iron bacteria buildup clogs well screens.

2.4.2 Proposed Well Sites

To determine the preferred locations for new wells, the SqCWD conducted a preliminary screening evaluation of 25 potential sites within the four service areas. These 25 sites, shown on Figure 5-1 in Chapter 5, Alternatives, were comprised of District-owned parcels as well as other non-District properties that could potentially be acquired by the District. The potential well sites were evaluated based on preliminary screening criteria that assisted the District in identifying fatal flaws and evaluating the relative merits of the individual sites. As a result of the preliminary screening

Preliminary Site Screening Analysis

For a detailed discussion of the preliminary site screening analysis performed by the SqCWD during project development, including the site selection criteria and the results of the screening analysis for all 25 potential well sites, refer to Section 5.5 in Chapter 5, Alternatives.

¹³ No additional production wells are proposed in the Aromas aquifer because Service Area IV already has surplus capacity and the Aromas aquifer is currently being overdrafted; thus, the SqCWD does not want to increase production from that aquifer.

**TABLE 2-3
SUMMARY OF PROPOSED WELLS AND IMPROVEMENTS**

Well Site	Service Area	Estimated Instantaneous Pumping Rate (gpm)	District-Owned Parcel?	Proposed Improvements
O'Neill Ranch	1	750	No	<ul style="list-style-type: none"> • Municipal water supply well • Iron and manganese removal treatment plant • 1,750-foot-long potable water pipeline to tie into SqCWD distribution system at Soquel Drive and Daubenbiss Avenue • Lateral connection to existing sanitary sewer main along Soquel Drive • 370-foot-long raw water pipeline to connect to existing stormwater drainage system at Soquel Drive • Emergency stationary generator • Security fencing
Cunnison Lane	1	538	Yes	<ul style="list-style-type: none"> • Municipal water supply well • Iron and manganese removal treatment plant • Lateral connections to existing sanitary sewer, stormwater drainage, and potable water distribution systems along Cunnison Lane • Emergency stationary generator • Security fencing
Austrian Way	2	250	Yes	<ul style="list-style-type: none"> • Municipal water supply well • Iron and manganese removal treatment plant • 200-foot-long lateral connection to existing sanitary sewer main at Austrian Way and Jennifer Drive • Lateral connection to existing SqCWD potable water distribution system at Austrian Drive • 600-foot-long raw water pipeline to connect to existing stormwater drainage system at Austrian Way and Vienna Drive • Emergency stationary generator • Security fencing
Granite Way–Aptos Village	2	245	No	<ul style="list-style-type: none"> • Municipal water supply well • 520-foot-long raw water pipeline to T. Hopkins Water Treatment Plant • Security fencing
Polo Grounds	3	500	No	<ul style="list-style-type: none"> • Conversion of existing irrigation well to municipal water supply well (installation of larger pump and motor) • Iron and manganese removal treatment plant • 2,690-foot-long sewer lateral to connect to sanitary sewer main at North Polo Drive • 2,680-foot-long potable water pipeline to connect to water distribution system at North Polo Drive • 560 feet of additional potable water pipeline to connect to water distribution system at South Polo Drive • 1,100-foot-long raw water pipeline to connect to existing stormwater drainage system • Emergency stationary generator • Security fencing

analysis and neighborhood opposition to the Suncatcher Well, the five sites selected for the development of the proposed well and treatment facilities under the WMP are the O'Neill Ranch, Cunnison Lane, Austrian Way, Granite Way-Aptos Village, and Polo Grounds Well sites.

O'Neill Ranch Well Site

The O'Neill Ranch Well site is an undeveloped inland site located at 41st Avenue and Soquel Drive, 1.6 miles from the coast. This site is outside of the corporate limits of Capitola and under the County's land-use jurisdiction. The site is part of a 1.6-acre parcel owned by the Santa Cruz County Redevelopment Agency and zoned Community Commercial (C-2). The District proposes to acquire the parcel or the eastern section of the parcel for the proposed well and treatment plant. Surrounding land uses consist of retail/commercial to the south and west, high-density residential to the east, and urban open space to the north.

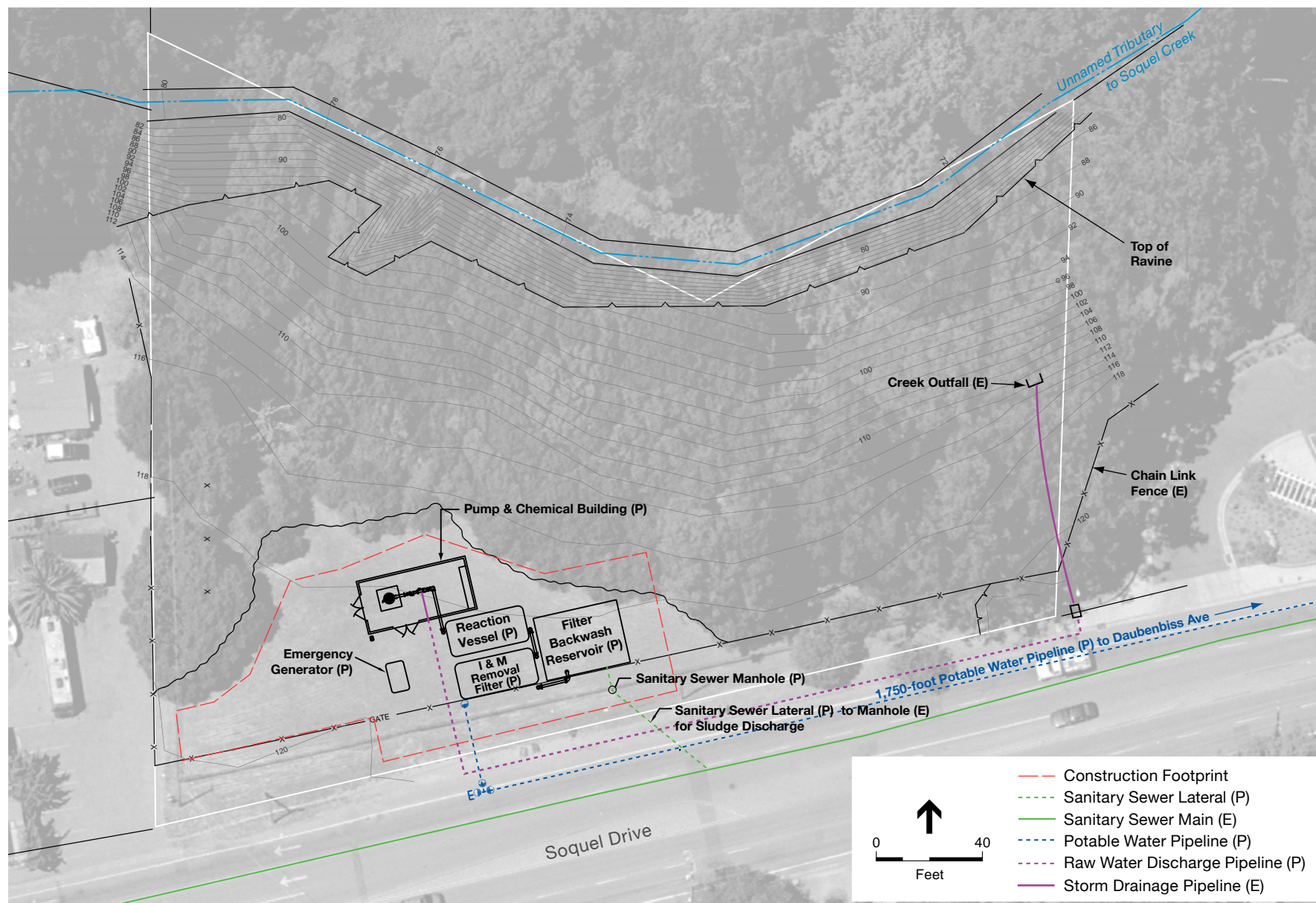
The O'Neill Ranch Well site slopes north toward a large ravine that drains to an unnamed ephemeral tributary to Soquel Creek that flows easterly along the northern boundary of the parcel. Several large oak trees line the top banks of the ravine, and some of these trees may need to be removed to accommodate construction of the well and treatment plant. Proposed site improvements include: a municipal production well; an iron and manganese removal treatment plant; an approximately 1,750-foot-long 12-inch-diameter potable water pipeline to tie into the SqCWD water system at Soquel Drive and Daubenbiss Avenue; a lateral connection to the existing sanitary sewer main along Soquel Drive; an approximately 370-foot-long storm drain pipeline to connect to the existing stormwater drainage system along Soquel Drive; an emergency stationary generator; and security fencing (see **Figure 2-3**). Water produced at the O'Neill Ranch Well would provide an estimated capacity of 750 gpm for Service Area I. This well would be approximately 600 feet deep and would likely be screened in Purisima Unit¹⁴ AA as well as the underlying Tu aquifer. At least 13 privately owned wells are located within 3,500 feet of the site. SCWD's Live Oak Wellfield is within 7,700 and 9,700 feet of the O'Neill Ranch Well site.

Cunnison Lane Well Site

The Cunnison Lane Well site is a 0.4-acre undeveloped parcel owned by the District. The site is located on Cunnison Lane, north of Soquel Drive, about three-quarters of a mile inland from the coast. Surrounding land uses consist of single-family residential to the north, southeast, and south, and open space to the east and west. The parcel is relatively level and is bounded on the west by an unnamed tributary to Noble Gulch. A wooden fence marks the perimeter of the property.

Proposed facilities at the Cunnison Lane Well site include: a municipal production well; an iron and manganese removal treatment plant; lateral connections to the existing sanitary sewer system, potable water distribution system, and stormwater drainage system along Cunnison Lane; an

¹⁴ The Purisima Formation is a collection of distinct geologic units, which hydrogeologists have assigned the identification letters AA through F. See Section 3.3, Groundwater Resources, for information descriptions of the individual units.



Contour Interval = 2 ft.

SOURCE: ESA, 2010.

SqCWD Well Master Plan EIR . 205491

Figure 2-3
O'Neill Ranch Well Site
Preliminary Site Plan

emergency stationary generator; and security fencing (see **Figure 2-4**). This well would provide an estimated 538 gpm for Service Area I. The well would be screened in Purisima Unit A and would have an estimated well depth of 500 to 600 feet. There are at least 24 privately owned wells within 3,500 feet of the site.

Austrian Way Well Site

The Austrian Way Well site is a District-owned, 3.18-acre parcel located at Austrian Way and Jennifer Drive. Existing structures on the site include the Austrian Tank and a paved access road. A chain-linked security fence surrounds the water storage tank and auxiliary facilities. Surrounding land uses consist of single-family residential to the west and Nisene Marks State Park to the east. Aptos Creek flows in a southerly direction approximately 1,140 feet east and 350 feet below the site.

In addition to a municipal production well, the proposed infrastructure improvements include: an iron and manganese removal treatment plant; a 200-foot-long lateral connection to the existing sanitary sewer main at the intersection of Austrian Way and Jennifer Drive; a 600-foot-long pipeline to connect to the existing stormwater drainage system at the intersection of Austrian Way and Vienna Drive; a lateral connection to the SqCWD's existing potable water distribution system along Austrian Way; and an emergency stationary generator (see **Figure 2-5**). Water produced at this well would serve Service Area II. Based on a test well and evaluation of this site in 2007, the production capacity at this site is estimated at 250 gpm. The well would be screened in Purisima Units BC and DEF at an estimated depth of 900 to 1,000 feet below the ground surface (bgs). There are at least 10 privately owned wells within 3,500 feet of the site.

Granite Way–Aptos Village Well Site

The Granite Way–Aptos Village Well site is located at the end of Granite Way within the boundaries of the proposed Aptos Village Project. The site is owned by Barry Swenson Builders and is zoned Community Commercial (C-2). Although the exact location of the well is unknown at this time, it would likely be placed on a small portion of APN 041-011-20, a 4-acre parcel located off Cathedral Drive next to Village Drive. A portion of the site is currently used as a lumber yard. Although the remainder of the site is undeveloped, remnant pieces of concrete from previous structures remain on the site. Surrounding current and proposed land uses consist of commercial/retail, residential, and industrial. Aptos Creek flows in a southerly direction approximately 900 feet west of the site.

Proposed improvements at the Granite Way-Aptos Village Well site include: a municipal production well; approximately 520 linear feet of raw water pipeline to connect to the existing T. Hopkins Treatment Plant to the west of the site; and security fencing (see **Figure 2-6**). Raw water produced at this well would be piped via the proposed 520-foot-long new raw water pipeline to the T. Hopkins Treatment Plant for treatment prior to delivery to customers. This well would produce an estimated 250 gpm of capacity for Service Area II. This well would be screened in Purisima Unit DEF at an estimated depth of 600 to 700 feet bgs. There are at least 13 privately owned wells within 3,500 feet of the site at much shallower depths.

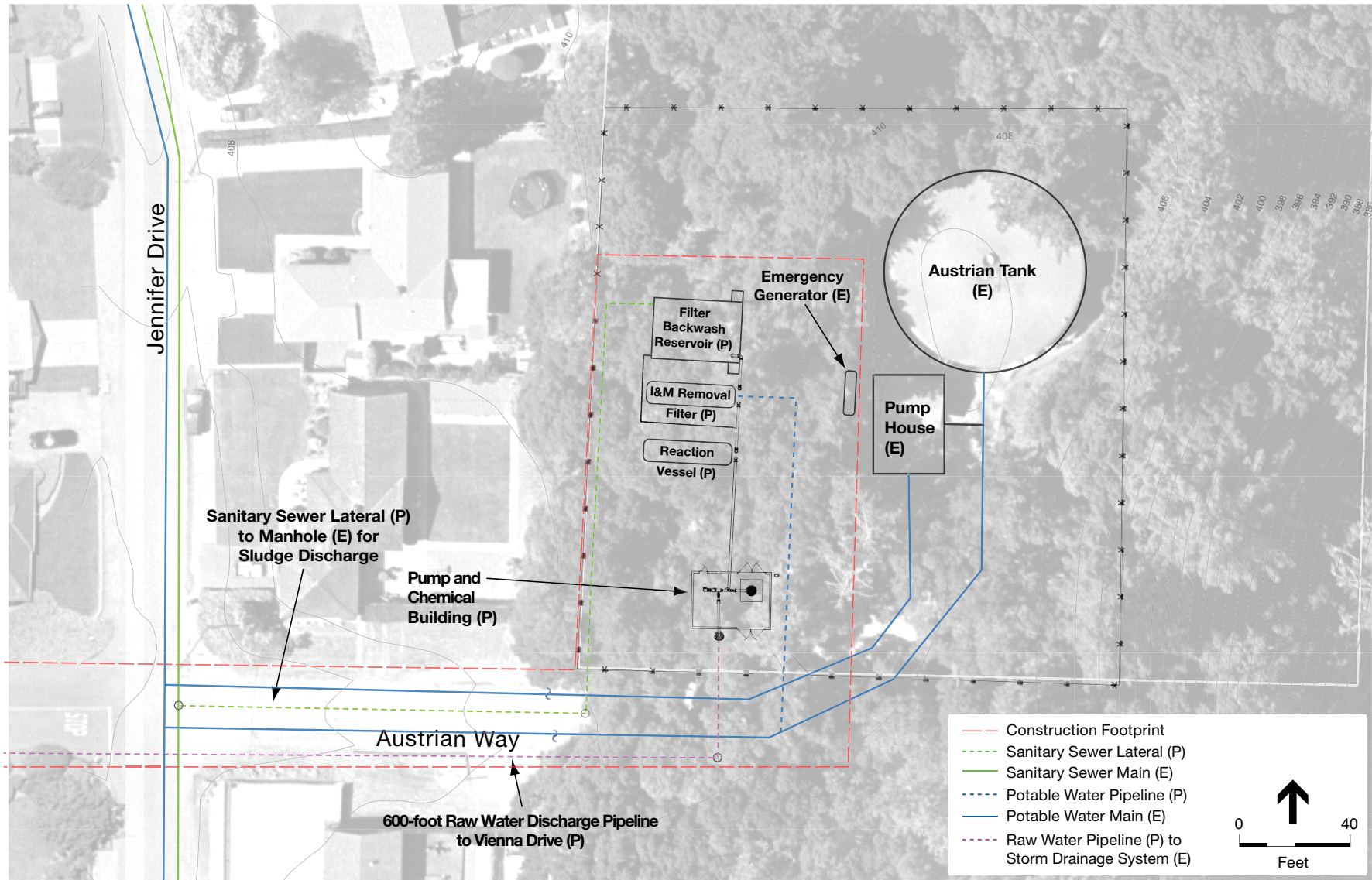


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SOURCE: ESA, 2010.

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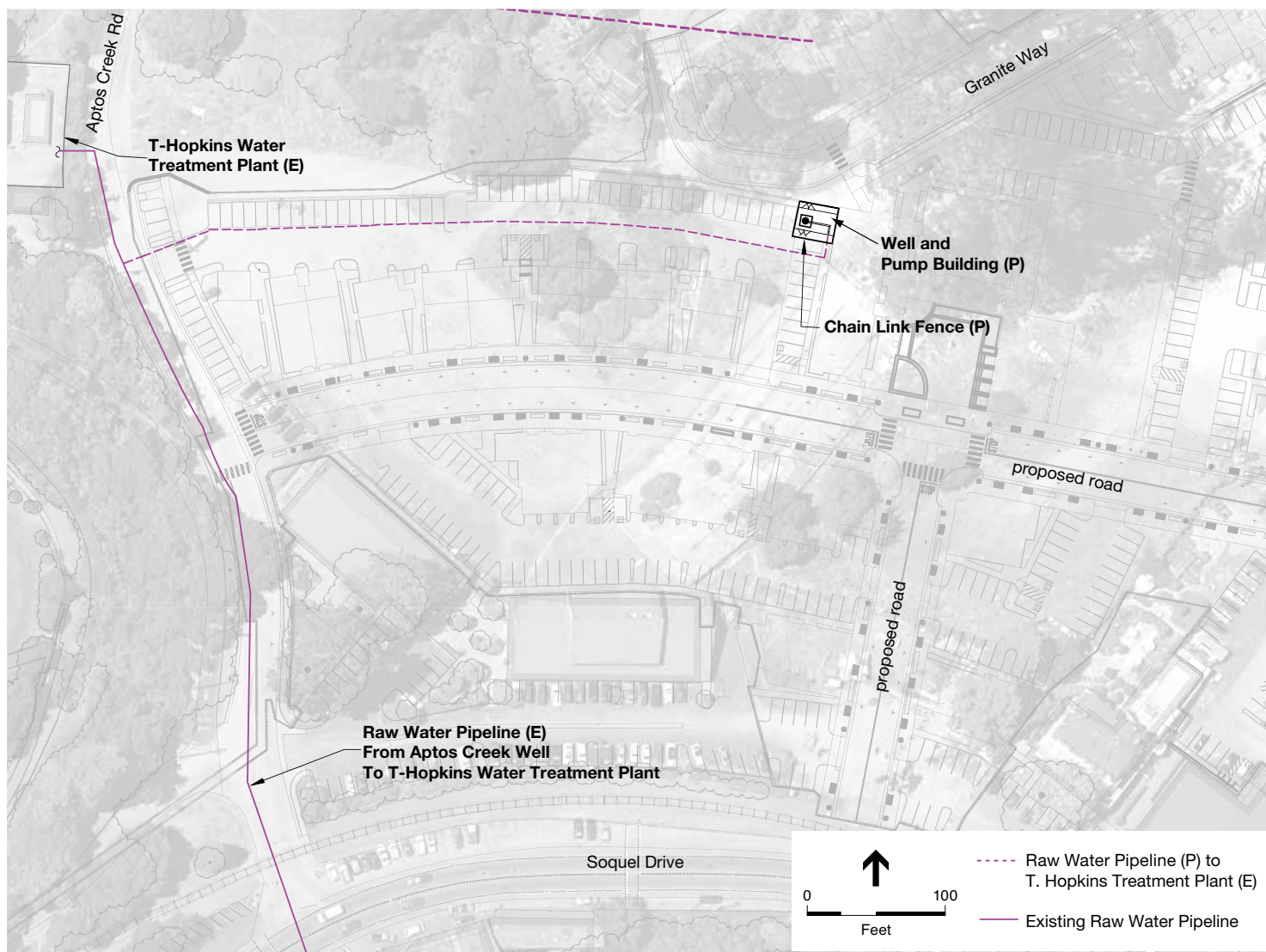
Figure 2-4
Cunnison Lane Well Site
Preliminary Site Plan



SOURCE: ESA, 2010.

SqCWD Well Master Plan EIR . 205491

Figure 2-5
Austrian Way Well Site
Preliminary Site Plan



Note: This figure shows The Aptos Village Plan (adopted February 23, 2010) over an aerial photograph of existing conditions.

SOURCE: ESA, 2010.

SqCWD Well Master Plan EIR . 205491

Figure 2-6
Granite Way-Aptos Village Well Site
Preliminary Site Plan

Polo Grounds Well Site

As part of the WMP, ownership of the existing County-owned irrigation well at Polo Grounds Regional Park would be transferred to the District and converted to a municipal well. Polo Grounds Regional Park is a 62-acre park located in Aptos between North Polo Drive and South Polo Drive and above Rio del Mar Boulevard. Park facilities include three soccer fields, three baseball diamonds, a dog park, paved parking areas, and a grassy area known as the “great meadow”. The irrigation well is located at the northeast end of the park in the great meadow. Valencia Creek flows in a southwest direction along the northwest park boundary, approximately 400 feet west of the existing irrigation well. The park does not have a potable water supply and is not connected to the sanitary sewer system. Restroom facilities at the park consist of portable toilets. Surrounding land uses are predominantly single-family residential. Homes along North Polo Drive are on private septic systems but a sanitary sewer main is being constructed along North Polo Drive to encourage connections to the sanitary sewer.

The existing irrigation well, built in 1980, would be converted to a mid-sized municipal production well with a 500-gpm capacity and would provide water for Service Area III. The well is completed in Purisima Unit F at a depth of 400 feet bgs. Proposed improvements at the Polo Grounds Well site include: an onsite iron and manganese removal treatment plant; a 2,690-foot-long sanitary sewer lateral to connect to the sewer main along North Polo Drive; a 2,680-foot-long potable water pipeline to connect to the water distribution system at the east end of North Polo Drive; an additional 560 feet of potable water pipeline to connect to the water distribution system at the east end of South Polo Drive; a 1,100-foot-long raw water pipeline to connect to the existing stormwater drainage system; an emergency stationary generator; and security fencing (see **Figures 2-7 and 2-8**). There are at least 13 private and mutual wells within 3,500 feet of the site. In addition, five municipal wells operated by the CWD are located between 2,800 and 7,500 feet from the Polo Grounds Well.

2.4.3 Proposed Changes in Status of Existing Wells

The WMP proposes to change the current production status of three of the District’s existing production wells: the abandonment and destruction of one deteriorated production well (Monterey Well), and the removal of two wells from production and maintenance of those wells in inactive status (Maplethorpe Well, and either T. Hopkins or Aptos Creek Wells, depending on the performance of these wells when the proposed Granite Way-Aptos Village Well comes online). The inactive wells would be placed in emergency standby status and would only be operated as production wells when necessary to meet demand if other wells are temporarily unavailable.

Chapter 7.70 of the Santa Cruz County Code (Santa Cruz Well Ordinance) regulates the abandonment and destruction of production wells and the maintenance of production wells in inactive status, including emergency standby wells. An abandoned well is defined as any well whose original purpose and use has been permanently discontinued or which is in such a state of disrepair that it cannot be used for its original purpose. Abandonment and destruction of the Monterey Well would be conducted in accordance with the Santa Cruz Well Ordinance, which

specifies that an appropriate sealing material (such as cement grout) must be pumped into the bottom of the well to 5 feet bgs to prevent the migration of contaminants into the well, the casing be cut off 5 feet bgs, and the excavation backfilled to the surface by compacted native material (i.e., soil).

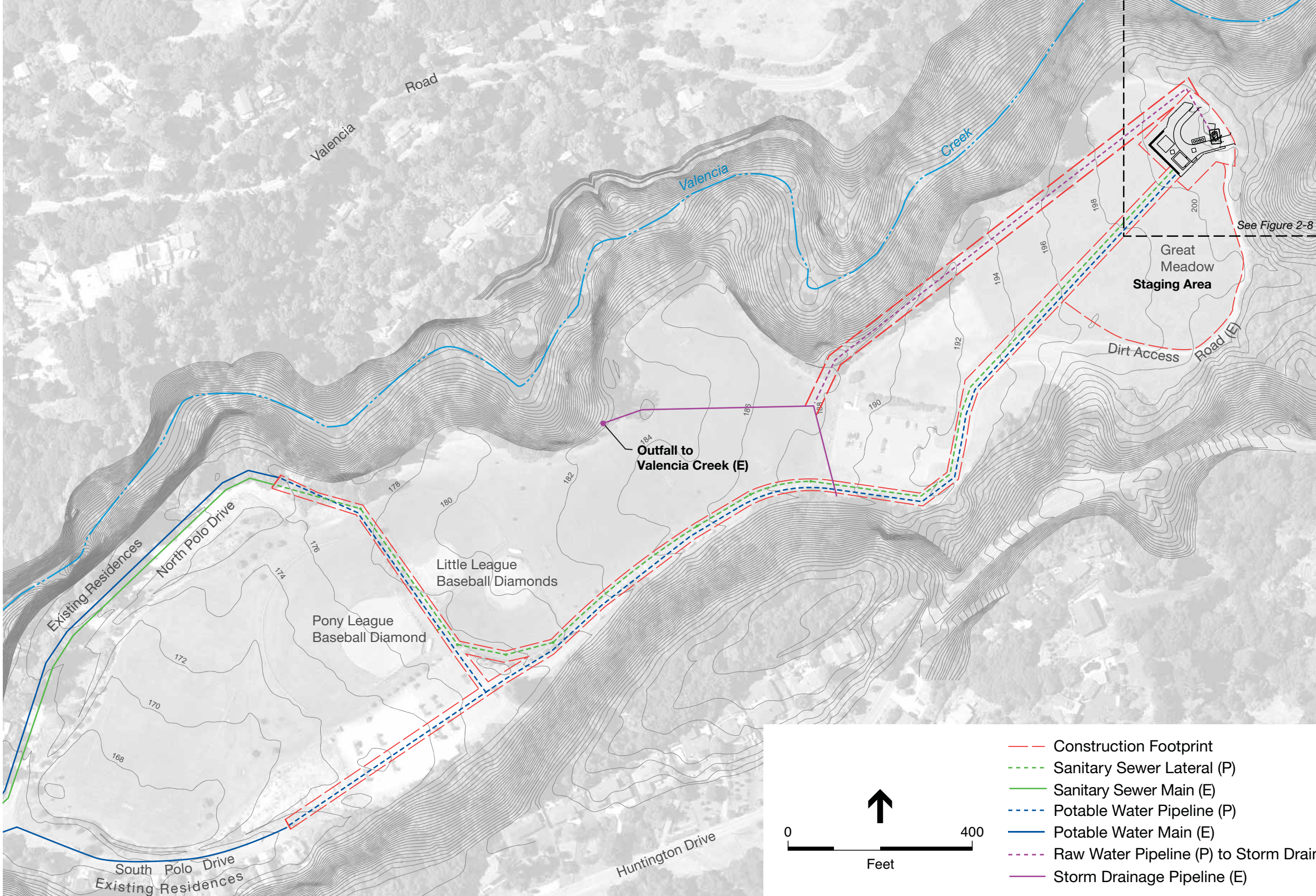
The Maplethorpe Well, and either the T. Hopkins Well or Aptos Creek Well would be maintained as inactive wells in accordance with the Santa Cruz Well Ordinance. Per the Santa Cruz Well Ordinance, inactive wells must be properly maintained such that: the well is secured with a watertight cover that cannot be easily removed; the well is marked so that it can be clearly seen; the area around the well is kept clear of brush or debris; and the pump is maintained in the well with an approved power supply, except for temporary removal for repair or replacement. These measures would ensure inactive wells do not pose risks to groundwater quality from introduction or migration of contaminants. Although the Maplethorpe Well, and either the T. Hopkins Well or Aptos Creek Well, would be maintained as inactive, the District would have the flexibility of utilizing these wells for production, monitoring, or other purposes in the future.

2.4.4 Well Site Design

New production wells at the O'Neill Ranch, Cunnison Lane, Austrian Way, and Granite Way-Aptos Village Well sites would be installed to depths ranging from 500 to 1,000 feet bgs. As proposed, each well would be equipped with an electrical vertical turbine pump with a pumping rate in the range of 250 to 750 gpm. The pumps would be driven by either aboveground electric motors or submersible motors with 50 to 150 of horsepower. At the O'Neill Ranch, Cunnison Lane, and Austrian Way Well sites, an approximately 30-foot-long by 20-foot-wide single-story building would house the production well, pump motor, electrical control panels, secondary containment for sodium hypochlorite and other hazardous chemicals associated with the treatment of water, as well as eyewash and shower stations. At the Polo Grounds Well site, storage for sodium hypochlorite would be in a separate building. Although the design of the well facilities would be slightly modified to be compatible with the surrounding land uses, pump buildings would typically have a gable roof and be constructed of split face concrete block. Raw groundwater produced during periodic maintenance activities and during well pump tests would be discharged to either the sanitary sewer system or the stormwater drainage system. Any discharges to the sanitary sewer system would be performed in coordination with the Santa Cruz County Sanitation District (SCCSD). All new connections to the stormwater drainage system would be designed in accordance with the Santa Cruz County Department of Public Works' (SCCDPW) drainage design criteria.

The proposed treatment plants at the O'Neill Ranch, Cunnison Lane, Austrian Way, and Polo Grounds Well sites would include a chemical disinfection system, iron and manganese removal filter, reaction vessel, a backwash reservoir, and secondary containment for sodium hypochlorite (bleach) and any other hazardous chemicals stored onsite.¹⁵ The chemical disinfection system

¹⁵ Raw water pumped at the proposed Granite Way-Aptos Village Well site would be treated at T. Hopkins Treatment Plant. Therefore, this well site would not include disinfection and treatment facilities and would not require secondary containment for hazardous chemicals used during the treatment process.

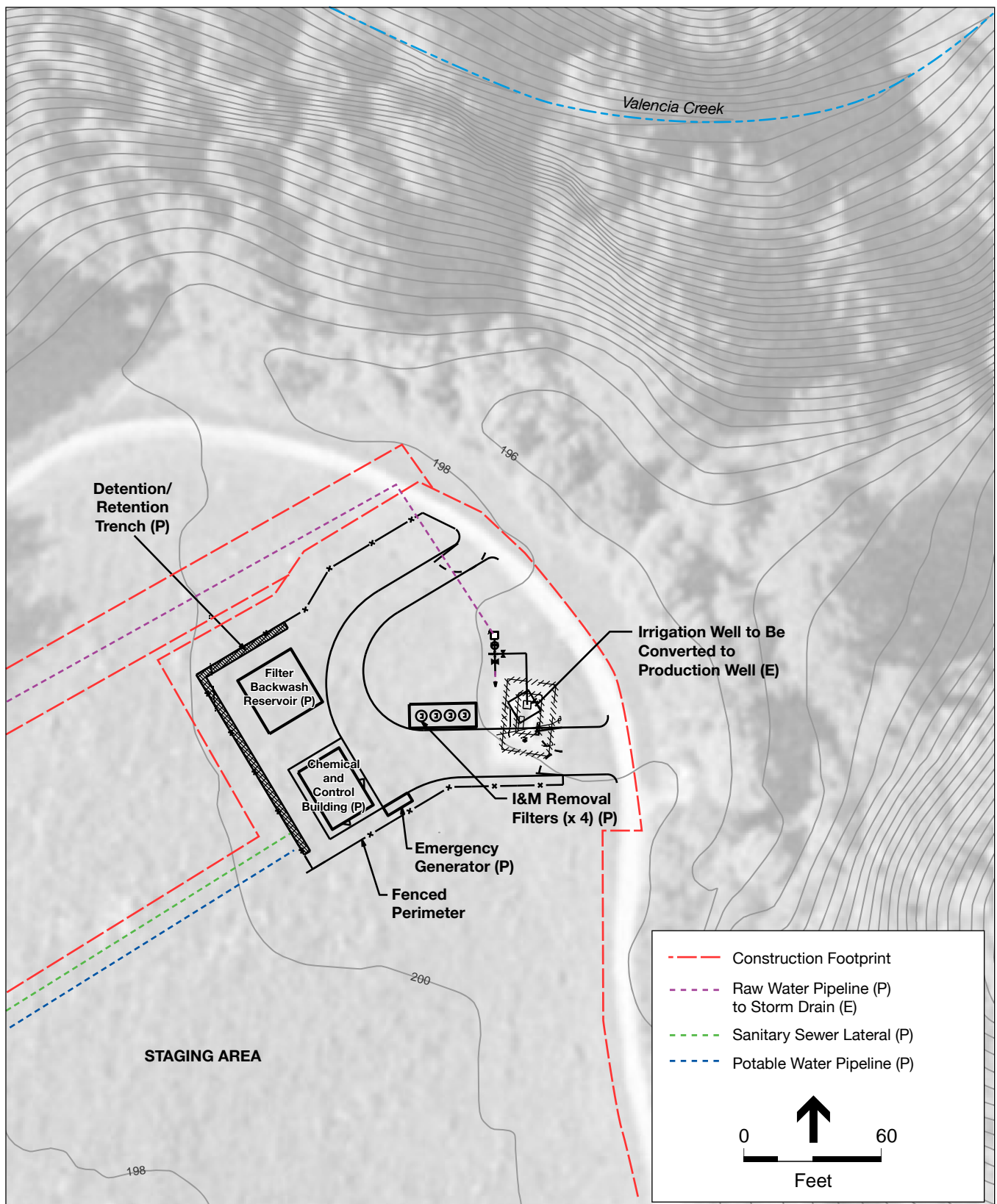


SOURCE: ESA, 2010.

SqCWD Well Master Plan EIR . 205491

Figure 2-7
Polo Grounds Well Site
Preliminary Site Plan

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SqCWD Well Master Plan EIR . 205491

SOURCE: KASL Consulting Engineers, 2010

Figure 2-8
Polo Grounds Well Site Preliminary Site Plan -
Treatment Facilities

would utilize sodium hypochlorite for wellhead treatment. The chemical reaction vessel would be comprised of an approximately 30-foot-long by 10-foot-diameter aboveground cylinder. The iron and manganese removal filter would likely be comprised of a cluster of four or six vertical cylinders approximately 8 feet in diameter and 8 feet high, or may be a horizontal cylinder of comparable volume. The actual size and configuration of the reaction vessel and iron and manganese removal filter would vary depending on the design requirements to achieve effective iron and manganese removal at each particular well site. The backwash reservoir would be approximately 30 feet long and 20 feet wide and would extend about 3 feet above the ground surface. Each of the proposed treatment plants would be equipped with a 300-horsepower diesel emergency generator. In addition, iron and manganese concentrate generated at well sites with proposed on-site water treatment facilities would be discharged to the sanitary sewer system.

Each well site would have adequate space to accommodate maintenance vehicle parking. With the exception of the Granite Way-Aptos Village Well site, each site would be equipped with an emergency stationary generator and aboveground diesel storage tank for backup power during emergency outages. Each well site would be equipped with a radio-based Supervisory Control and Data Acquisition (SCADA) system, licensed by the Federal Communications Commission (FCC), to allow for remote operation. The SCADA system consists of a 3-foot-long directional antenna mounted horizontally on a 2-inch-diameter steel pipe. The total height of the SCADA antenna would be approximately 20 feet and would comply with FCC regulations. All aboveground well components would be fenced off with security fencing topped with three-strand barbed wire and motion-sensored lighting in compliance with the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Public Law 107-188, Title IV-Drinking Water Security and Safety). Typically, fencing would be obscured with fencing slats and landscaping. Representative views of an existing SqCWD facility that would be similar to those proposed under the WMP are provided in **Figures 2-9** and **2-10**.

2.5 Project Construction

2.5.1 Typical Construction Scenarios

Construction activities would include site grading and excavation, well drilling and development, construction of pump and chemical buildings, installation of treatment facilities, construction of associated pipelines, paving of access driveways, and disposal of construction waste and debris. Construction equipment and materials would be stored within designated on-site staging areas. Staging would avoid sensitive areas such as riparian or other sensitive habitats. Construction vehicle parking would be accommodated on-site and on adjacent roadways. All aspects of well construction and pipeline installation would be conducted in accordance with California Department of Public Health (CDPH) requirements. The total duration of construction activities at each well site with proposed treatment facilities – O'Neill, Cunnison Lane, Austrian Way, and Polo Grounds – is approximately 12 months; the total duration of construction activities at the Granite Way-Aptos Village Well site is 1 month. The total duration of construction activities at each well site, as well as the approximate duration of each construction phase at each well site, are shown in **Table 2-4**.



SOURCE: ESA, 2010.

SqCWD Well Master Plan EIR . 205491

Figure 2-9
Typical Well Site Facilities



SOURCE: ESA, 2010.

SqCWD Well Master Plan EIR . 205491

Figure 2-10
Typical Street Views

**TABLE 2-4
CONSTRUCTION DURATIONS**

Well Site	Total Construction Duration	Construction Phase / Duration
O'Neill Ranch	Up to 12 months	<ul style="list-style-type: none"> Well installation and development – 3 weeks Construction of pump and chemical building, installation of treatment facilities – 12 months Pipeline installation – 3 weeks
Cunnison Lane	Up to 12 months	<ul style="list-style-type: none"> Well installation and development – 3 weeks Construction of pump and chemical building, installation of treatment facilities – 12 months Pipeline installation – 2 to 3 days
Austrian Way	Up to 12 months	<ul style="list-style-type: none"> Well installation and development – 3 weeks Construction of pump and chemical building, installation of treatment facilities – 12 months Pipeline installation – 1 week
Granite Way–Aptos Village	Approximately 1 month	<ul style="list-style-type: none"> Well installation and development – 3 weeks Construction of pump building – 4 weeks Pipeline installation – 1.5 weeks
Polo Grounds	Up to 12 months	<ul style="list-style-type: none"> Construction of pump and chemical building, installation of treatment facilities – 12 months Pipeline installation – 2 months

NOTE: The duration of individual construction phases at each site are not cumulative; certain construction phases would occur simultaneously.

Well Drilling and Development

Well installation and development at the O'Neill Ranch, Cunnison Lane, Austrian Way, and Granite Way-Aptos Village Well sites would occur over a three-week period. This construction phase includes site mobilization, initial clearing and grading of the site, drilling of the well borehole, and installation of the well casing and gravel pack. Drilling of the production well borehole would require 24-hour construction for four days. Continuous activity would be required to avoid a collapse of the borehole, which could occur if the borehole were left unsupported before the well casings were installed. A truck-mounted drill rig comprised of a derrick, power unit, pump, and double hole assembly consisting of the drill bit (used to cut soil), drill pipe, and discharge pipe (where cuttings are entrained and suctioned out), would be used. A drilling fluid would be used to cool the drill head and transport the cuttings during drilling operations. The cut materials from the drilling process would be suctioned into the drill pipe and then discharged through the discharge pipe into a baker tank. Baker tanks would be used on site to control drilling mud and fluids during well development. Following drilling, the well casing and well screens would be installed. The well casing serves as a housing for the well pump and as a vertical conduit for water flowing upward from the aquifer to the pump intake. The well screens allow water to enter the casing. A gravel envelope would be placed around the well screen to prevent sediment from entering the water during pumping operations. The well casing would be grouted

to near the top of the uppermost well screen. In addition, a conductor casing would be installed to a depth of 50 feet bgs to provide a sanitary seal in accordance with CDPH requirements. Typical construction equipment for well installation and development would consist of a drill rig, boom truck or crane, backhoe, air compressor, forklift, electrical generator, baker tank, welding equipment, and miscellaneous support vehicles.

General Construction Activities

General construction activities associated with construction of the pump and chemical building, and installation of treatment facilities at the O'Neill Ranch, Cunnison Lane, Austrian Way, and Polo Grounds Well sites would occur over twelve months. Construction of the pump building at the Granite Way-Aptos Village Well site would occur over 4 weeks. These construction activities, which would occur simultaneously with well installation and development, would entail site excavation, concrete work for foundations, building construction, installation of treatment facilities (where applicable), and construction of access driveways. Excavation dimensions for installation of production well facilities would vary depending on the well site, but would generally require excavation depths of 3 to 5 feet for construction of slab-on-grade foundations for each pump building and chemical building, and up to 8 feet of excavation for installation of each backwash reservoir. Chemical reaction vessels and iron and manganese removal filters would be prefabricated and hauled to each site on flatbed trucks. Access driveways at all five proposed well sites would be surfaced with baserock¹⁶ to allow for maintenance vehicle access and parking adjacent to the pump and chemical building.¹⁷ Upon completion of construction activities at each site, the construction contractor would stabilize the project site by revegetating disturbed areas with exposed soils and installing permanent erosion and sedimentation controls to minimize post-construction erosion. Typical construction equipment for construction of pump and chemical buildings, and installation of treatment facilities would consist of an excavator, backhoe, forklift, boom truck or crane, concrete pumper, concrete truck, air compressor, electrical generator, paving equipment, flatbed trucks, haul trucks, and miscellaneous support vehicles.

Pipeline Installation

The duration of pipeline installation activities would vary by site based on the facilities proposed at that site and proximity to existing sanitary sewer mains, potable water pipelines, and treatment plants, as applicable. Pipeline installation would require open-trench construction within public rights-of-way and existing roadways. The trench would be up to 2 feet wide and 4.5 feet deep, depending on route conditions and utility conflicts. The ideal temporary construction easement for pipeline installation would be 25 feet wide (i.e., 12 feet for access by trucks and loaders, a 2-foot-wide trench, and additional width for maneuvering). After excavating the trench, the contractor would line the trench bottom with a bedding of sand or other appropriate material that would be shaped to support the pipeline. Installers would then place the pipe in the trench, join

¹⁶ Baserock is a layer of selected, processed, or treated aggregate material containing ¾-inch rock and clay binders of a planned thickness and quality placed immediately below the pavement and above the sub-base or basement soil.

¹⁷ At the Polo Grounds Well site, the existing dirt access road would be surfaced with baserock.

pipe sections together, and backfill the trench with excavated or imported material and compact the backfill. Pipeline construction would proceed at approximately 100 feet per day. Access to private driveways would be maintained with steel plates. Pipeline installation associated with the O'Neill Ranch, Cunnison Lane, Austrian Way, and Granite Way-Aptos Village Well sites may require temporary lane closures on a block-by-block basis along pipeline alignments. After pipeline installation, roadways and public rights-of-way would be repaved and/or restored to their preconstruction conditions as appropriate. Typical construction equipment for pipeline installation would consist of a backhoe, excavator, compaction equipment, pavers and rollers, loader, air compressor, electrical generator, small crane or boom truck, pipe cutting and welding equipment, baker tank, flatbed trucks, and haul trucks.

Waste Disposal

Sources of solid waste from project construction activities include excavated concrete, rock, soil, and construction debris. Collectively, the estimated volume of solid waste that would be generated during project-related construction activities at all five well sites is estimated at 7,690 cubic yards (see **Table 2-5**). Solid waste generated during project construction would be hauled to the Buena Vista Landfill in Santa Cruz County and/or the Monterey Peninsula Landfill and Recycling Facility (commonly referred to as the Marina Landfill) in Monterey County.

**TABLE 2-5
ESTIMATED CONSTRUCTION WASTE**

Well Site	Construction Waste
O'Neill Ranch	1,255 cubic yards
Cunnison Lane	720 cubic yards
Austrian Way	1,035 cubic yards
Granite Way– Aptos Village	335 cubic yards
Polo Grounds	4,345 cubic yards
TOTAL =	7,690 cubic yards

2.5.2 Proposed Implementation Schedule

Implementation of the WMP would likely occur over a five-year period, with one new well constructed each year. Assuming EIR certification in 2011, all five wells could be online by 2015. The order of well development would depend on the order in which the well sites become available. Proposition 50 grant money awarded to the Santa Cruz County Regional Water Management Foundation includes funds for implementing the proposed improvements at the Polo Grounds Well site, as a result the Polo Grounds Well is anticipated to be the first well to be added to the system. The O'Neill Ranch Well would likely be the second well to be constructed. The Monterey Well would be destroyed after completion of the O'Neill Ranch Well. The Granite Way-Aptos Village Well would likely be the third well to be implemented, and either the Aptos Creek or T-Hopkins Well would be placed on emergency standby status after completion of the Granite Way–Aptos

Village Well. The Maplethorpe Well would be maintained as an inactive well after completion of either the Cunnison Way or Austrian Way Well, whichever is constructed first.

Hypothetical examples of how the District would redistribute pumping as wells are brought into service were developed by the District's consulting hydrogeologist, HydroMetrics LLC (HydroMetrics). Refer to Section 3.2, Groundwater Resources, for a detailed discussion of the hypothetical redistribution scenarios, including future pumping by the District as wells are brought on-line.

2.6 Future Operations and Maintenance

2.6.1 Proposed Operations and Maintenance Activities

The proposed wells would be operated similar to existing production wells and would be operated remotely via a radio-based SCADA system. Wells would be operated such that when they are started or shut off, the pump would discharge raw groundwater for a period of 40 seconds to the filter backwash reservoir for subsequent treatment and delivery to customers.

Twelve and one half percent (12.5%) sodium hypochlorite would be delivered about once a week in a vehicle that meets Department of Transportation licensing requirements for transport of this chemical. Sodium hypochlorite would first be pumped from the large sodium hypochlorite bulk storage tank at the District's main yard and then delivered to each well site using a 1-ton flatbed truck containing a tank.

Regular maintenance of each well site by SqCWD Operations and Maintenance personnel would occur approximately five times per week to check well pumps and treatment equipment and to record the volume of water pumped and the residual chlorine entering the water system.

Emergency generators would be tested during the daytime approximately once a week at each well location where an emergency generator is proposed (i.e., all sites except Granite Way-Aptos Village Well site). Approximately every five years, the proposed wells and pump equipment would require repairs to the well pump and column piping, or replacement of the well pump and electrical cable. These maintenance events would require a drill rig and involve a crew working roughly three to four weeks. During such maintenance events, the well might be chemically treated to restore pumping capacity.

Approximately once per year, the well and treatment facilities would be flushed to wash away debris. These maintenance activities would require that raw groundwater be flushed through the system for a period of four hours. In addition, approximately once every two years, well pump testing would be performed to evaluate the capacity and efficiency of the wells and check for equipment problems. Raw groundwater produced during periodic maintenance activities (i.e., flushing of the well and treatment facilities) and well pump tests would either be discharged to the local sanitary sewer system or discharged to the local stormwater drainage system. If discharged to the local stormwater drainage system, because these discharges are considered to be a low threat to water quality, the discharges would be covered as a conditionally exempted discharge under

the Central Coast RWQCB'S Regionwide General NPDES Permit for Discharges with Low Threat to Water Quality (General Permit) (Order No. 01-119, NPDES No. CAG993001).

About every four weeks, the District landscaper would visit each well site to cut and trim weeds, trees, and hedges; adjust or repair the irrigation systems; and make minor repairs to the fence, gate, security lighting, or other onsite facilities.

2.6.2 Redistribution of Pumping

With implementation of the WMP, the District would have a sufficient number of strategically placed wells to provide redundancy and flexibility in the District's well field, thereby allowing the District to more evenly redistribute its groundwater pumping and shift extractions away from the coast. This redistribution would be aimed at achieving more uniform drawdown in the groundwater basin and reducing susceptibility to seawater intrusion.

Although implementation of the WMP would increase SqCWD's annual well production capacity by approximately 1,830 ac-ft/yr, from 8,010 to 9,840 ac-ft/yr, this increased capacity would not translate to an increase in groundwater pumping. With implementation of the WMP, pumping would be distributed among all of the active wells to meet the goals of the *AB 3030 Groundwater Management Plan for the Soquel-Aptos Area*, subject to the constraints of meeting water demand within each of SqCWD's four service areas and the limited capacity to transfer water between service areas. Hypothetical pumping redistribution scenarios have been developed by HydroMetrics to demonstrate how SqCWD would allocate pumping among active wells without increasing overall pumping while reducing susceptibility to seawater intrusion, achieving more uniform drawdown, and meeting the demands within each service area. (Refer to Section 3.2, Groundwater Resources, for a detailed discussion of the hypothetical redistribution scenarios and future pumping by the District under various conditions.) Distribution of pumping among individual active wells would likely change over time in response to short-term hydrologic conditions and long-term water-level trends; flexibility is an important objective of the WMP.

2.6.3 Adaptive Management

Actual distribution of pumping amongst wells would be determined through monitoring activities and adaptive management strategies. Data collected from ongoing groundwater and surface water monitoring programs would be analyzed and reported annually. Groundwater monitoring data would be used to characterize groundwater storage trends, groundwater levels, and changes in groundwater contours, as well as to detect seawater intrusion and landward movement of the seawater/freshwater interface. Surface water monitoring would help to identify any changes in stream flow that may be attributable to groundwater pumping. This data would form the basis for annual modifications to the distribution of pumping by SqCWD. Evidence of seawater intrusion, baseflow depletion, anthropogenic contamination, or excessive drawdown could all be cause for modifying the groundwater pumping redistribution. Implementation of the WMP would provide the SqCWD more flexibility to shift pumping in response to short-term hydrologic conditions and long-term water-level trends, thereby improving groundwater conditions in the basin.

2.7 Permits and Approvals

Implementation of the WMP could require permits from the following agencies, depending on the characteristics at each well site:

- California Department of Public Health (site plans and specifications and operating permits)
- Santa Cruz County Environmental Health Department (sodium hypochlorite permit and well drilling permits)
- Monterey Bay Unified Air Pollution Control District (permits for emergency generators)
- California Department of Fish and Game (memorandum of understanding regarding threatened and endangered species listed under the Endangered Species Act, if applicable)
- Regional Water Quality Control Board (National Pollutant Discharge Elimination System permits)
- Santa Cruz County Public Works Department (roadway encroachment and drainage permits)
- Santa Cruz County Sanitation District (sewer connection fees and pretreatment permit for industrial waste discharge)

In addition, temporary or permanent easements would be required for site access and utility siting at the Polo Grounds and Granite Way-Aptos Village Well sites.

2.8 References – Project Description

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