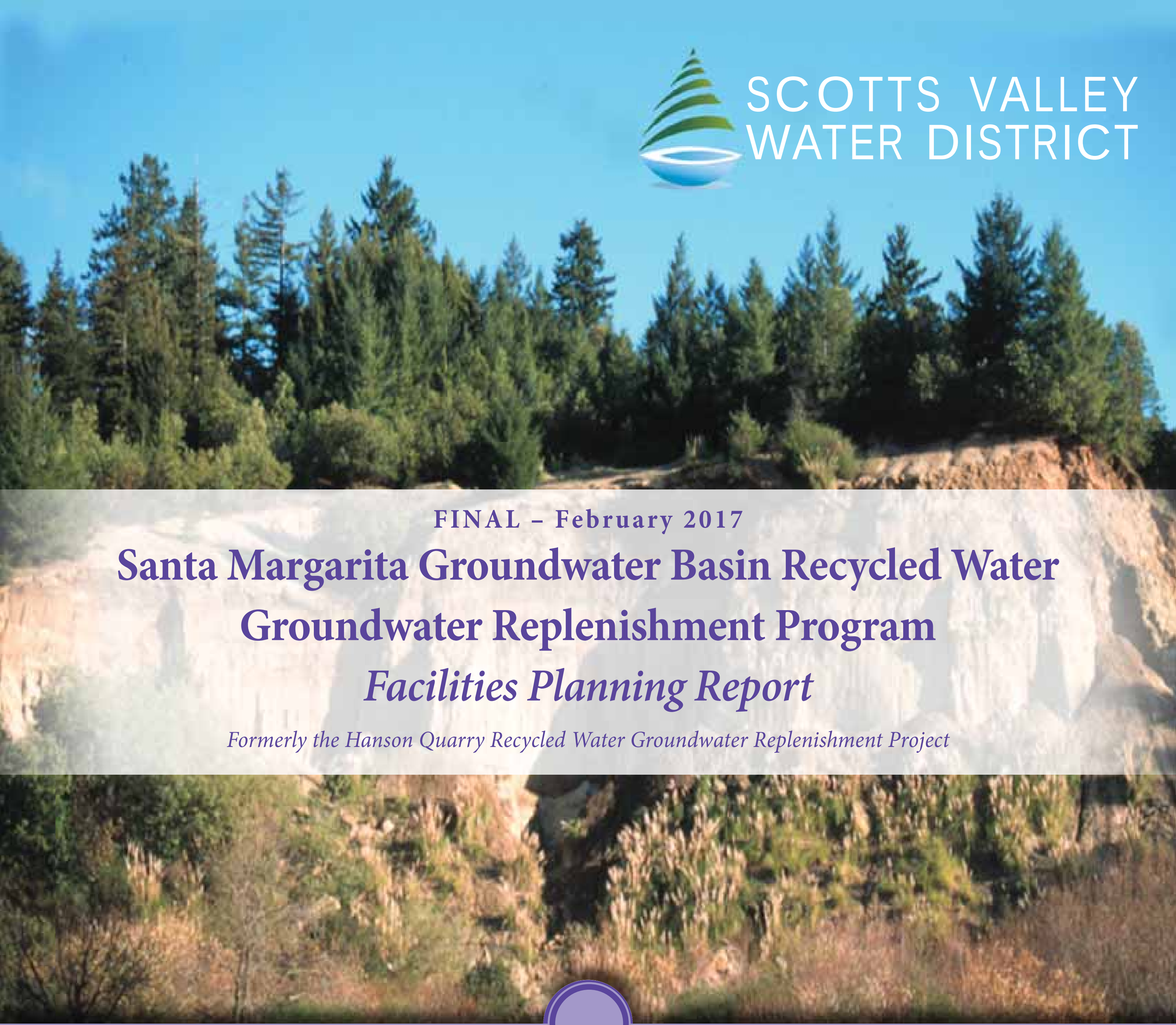
SCOTTS VALLEY WATER DISTRICT



FINAL – February 2017

Santa Margarita Groundwater Basin Recycled Water Groundwater Replenishment Program

Facilities Planning Report

Formerly the Hanson Quarry Recycled Water Groundwater Replenishment Project

With financial support from:

Water Boards

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Santa Margarita Groundwater Basin Recycled Water Groundwater Replenishment Program FINAL Facilities Planning Report

Formerly the Hanson Quarry Recycled Water Groundwater Replenishment Program"

February 2017

Signed 2/1/17

Prepared for

Scotts Valley Water District
2 Civic Center Drive
Scotts Valley, CA 95066

K/J Project No. 1568002.01

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Acknowledgments

Funding for this plan has been provided in full or in part through an agreement with the State Water Resources Control Board. The contents of this document do not necessarily reflect the views and policies of the State Water Resources Control Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

The original title for this project was "Hanson Quarry Recycled Water Groundwater Replenishment Program - Facilities Planning Report"; the title has been refined to "Santa Margarita Groundwater Basin Recycled Water Groundwater Replenishment Program-Facilities Planning Report" to be more inclusive of other sites in the Scotts Valley area.

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Executive Summary

Scotts Valley, California is a small community nestled in the Santa Cruz Mountains that is served by the Scotts Valley Water District (SVWD or District), a public agency that manages and supplies water to the City of Scotts Valley (City) and adjacent unincorporated areas of the County. Water supplies for SVWD are solely derived from the local groundwater basin, and SVWD does not hold any surface water rights; thus, there is a limited number and type of additional water supplies available to SVWD.

SVWD has worked in cooperation with the City to develop a water recycling program for the Scotts Valley area, in which the City produces the recycled water and SVWD distributes it to customers. The Recycled Water Program has been serving recycle water for irrigation use since 2002 to offset potable demands and is exploring options to expand the use of this local, reliable, drought-proof source of water supply. Due to the success of their existing program, the District has limited additional supply of recycled water in the summer months when irrigation demand is high and excess recycled water available in the winter and shoulder months when irrigation demand is low. With additional treatment to meet regulatory requirements; the excess recycled water flows would be available for aquifer recharge to replenish the local groundwater basin. A Groundwater Replenishment (GWR) project would inject advanced purified recycled water into the Lompico aquifer of the Santa Margarita Groundwater Basin (SMGB) in Scotts Valley to restore groundwater levels and retain the water within the SMGB watershed for beneficial use.

The purpose of this Facilities Planning Report (FPR) is to evaluate the potential for expanding the use of recycled water by developing a GWR Program for the SMGB. SVWD collaborated with the following local and regional stakeholders to prepare this FPR:

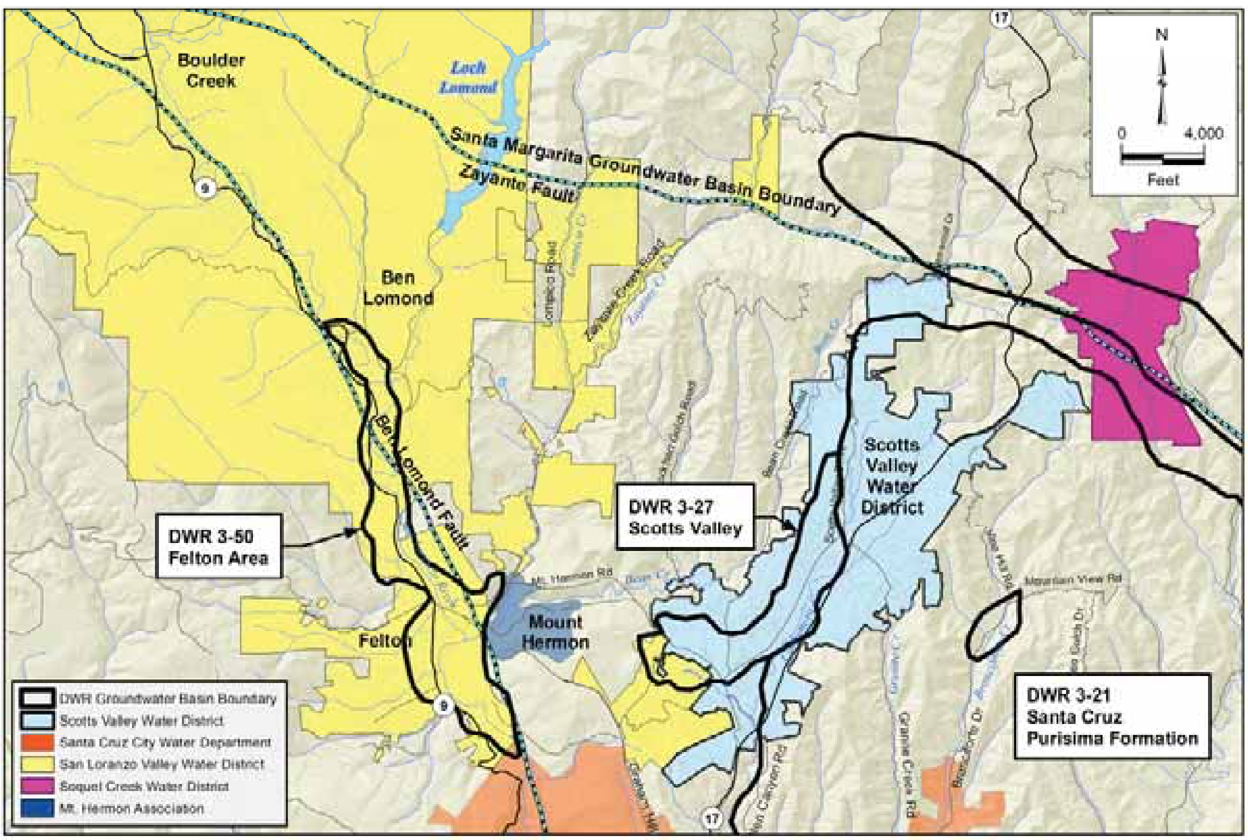
- City of Scotts Valley (City)
- County of Santa Cruz (County)
- City of Santa Cruz Water Department (SCWD)
- San Lorenzo Valley Water District (SLVWD)
- Mount Hermon Association (MHA)
- Santa Margarita Groundwater Basin Advisory Committee (SMGBAC)
- California Division of Drinking Water (DDW)

Santa Margarita Groundwater Basin

The SMGB provides water supply to approximately 40,000 people in Northern Santa Cruz County, California, including the City of Scotts Valley, and the communities of Mount Hermon, Felton, Ben Lomond, and Boulder Creek.

The SMGB has a complex geology and is divided into multiple aquifers. The Santa Margarita, Lompico and Butano aquifers provide the majority of the groundwater supply. The SMGB area includes three surface water bodies-- Bean Creek, Carbonero Creek, and the San Lorenzo River-- that are connected with the groundwater and provide recharge/discharge of the groundwater. The SMGB area also includes seeps and springs, including Ferndell Spring, Redwood Spring and Eagle Creek.

Figure 1: Santa Margarita Groundwater Basin Map



The Santa Margarita Groundwater Basin Advisory Committee (SMGBAC) actively monitors the water levels and quality in the SMGB and has developed an in-depth hydro-geological MODFLOW model and database of the basin and its different aquifers to help inform the management of the basin. The water agencies, municipalities and entities that are members of the SMGBAC include:

- SVWD
- SLVWD
- City
- County
- MHA

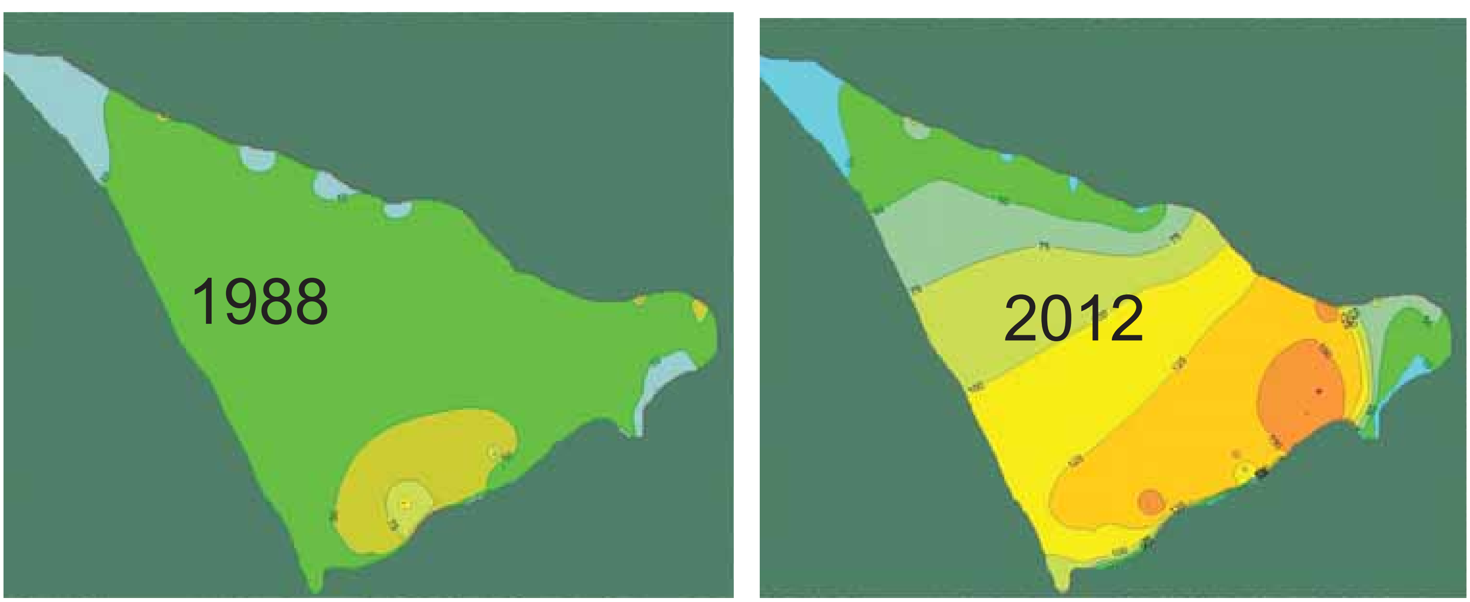
Historical Over-Draft of the SMGB Basin Lompico Aquifer

Precipitation, in the form of rainfall, is the only source of groundwater recharge in the SMGB. Groundwater recharge occurs from the direct percolation of rainfall through the soil and from infiltration of runoff through streambeds. The SMGB does not import any water from outside the region, such as from the California State Water Project or the Federal Water Project.

In the 1980's and 1990's, population growth, increased groundwater pumping, and reduced groundwater recharge due to urbanization and drought caused a significant drop in the groundwater levels in the SMGB aquifers. Water level declines were particularly acute in the Lompico Aquifer. Falling groundwater levels resulted in the preparation of a Water Resources Management Plan in 1983 followed by adoption of a Groundwater Management Plan in 1994.

As groundwater levels have dropped, the summertime baseline flows in Bean and Carbonero Creeks have dropped and some springs and seeps have dried up, reducing flows to the San Lorenzo River and impacting habitats and downstream fisheries, including endangered species.

Figure 2: SMGB Lompico Aquifer Historical and Current Groundwater Levels



In 1999, SVWD and the City developed a recycled water system that currently provides approximately 200 acre-feet per year (AFY) for non-potable use. The local water agencies and communities also have active water conservation programs.

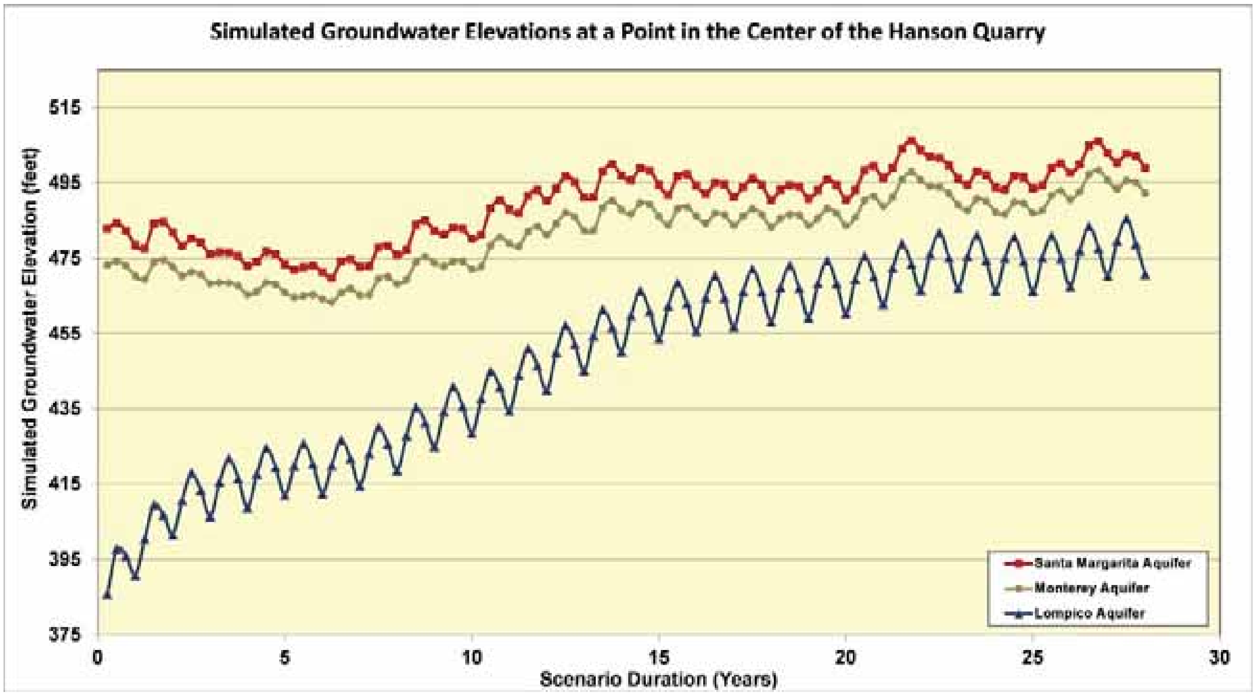
With active management, recycled water and conservation, the SMGBAC members have been able to stabilize the groundwater levels in the SMGB Lompico aquifer. However, over the past decade, the groundwater levels have not increased with reduced pumping rates. This indicates that the natural recharge of the deeper Lompico and Butano aquifers by percolation of rainwater or other surface recharge is a very slow process. The current over-drafted SMGB Lompico aquifer levels, shown on Figure 2, provide an opportunity for active groundwater replenishment and storage of water for future droughts.

Benefits of Active Groundwater Replenishment

Active groundwater replenishment could occur through in-lieu recharge and/or injection of water. In-lieu recharge takes place when another source of water, such as imported water, is used to meet demands, and well pumps are turned off. Water remains in the ground and the groundwater levels should rise from natural recharge

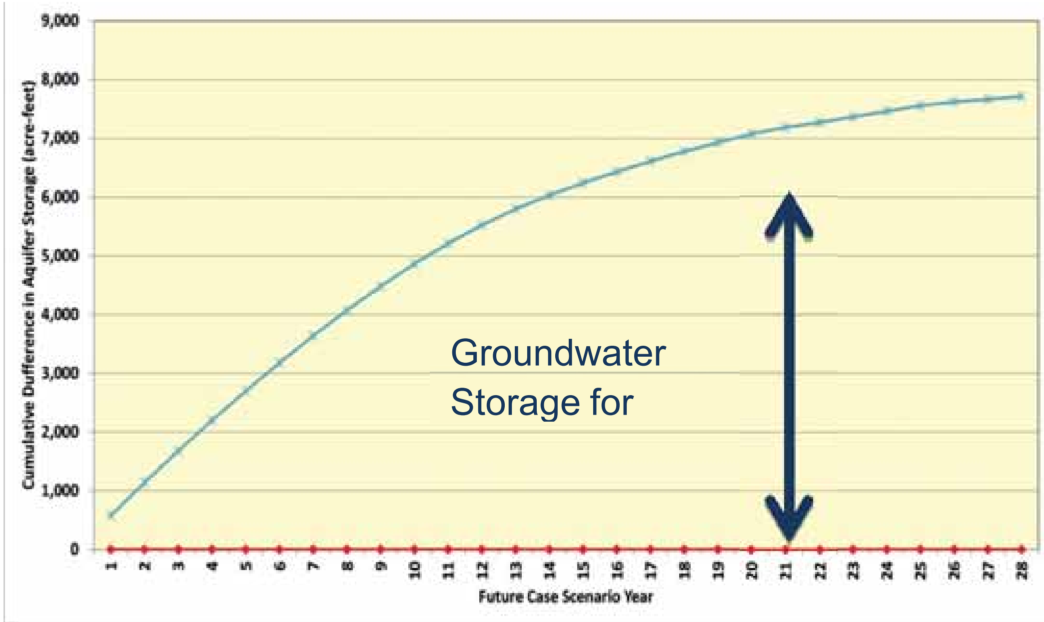
Active groundwater replenishment through injection of clean water provides a direct means of adding water to an aquifer and raising groundwater levels, without relying on the variable natural recharge process. The injection water can be filtered surface water, imported water, or purified recycled water. The figures below show the model results of active injection of approximately 560 AFY into the SMGB Lompico Aquifer. Figure 3 shows that groundwater levels could increase approximately 65 to 70 feet over 15 to 20 years. Section 8 describes additional analysis for replenishment in the Scotts Valley El Pueblo area which would have even greater benefit of approximately 150 to 190 feet of groundwater level increase. This would reduce the groundwater pumping energy requirements for all groundwater users in the area.

Figure 3: Lompico Aquifer Levels with Active GW Replenishment at Hanson Quarry



Raising the groundwater levels could also provide approximately 6,000 AF of water storage that could be tapped during droughts when surface water supplies are limited. Figure 4 shows cumulative additional aquifer storage over time with active groundwater injection which is similar for both the Hanson Quarry and Scotts Valley El Pueblo analyses.

Figure 4: Groundwater Storage for Droughts



In later years of active replenishment, the cumulative groundwater storage starts to plateau. This is because as groundwater levels rise, the groundwater starts to interact with the local creeks and springs and a portion of the injected water helps to increase the baseline flows in Bean and Carbonero Creeks. These increased surface water flows benefit the agencies with surface water rights, and benefits the environment, riparian habitats and downstream endangered species.

In summary, the overall benefits of active groundwater replenishment in the SMGB include:

- Storage of approximately 6,000 AF of water for drought supply.
- Reduced pumping energy requirements for groundwater users.
- Increased surface water flows in local creeks, which provides more water for surface withdrawal.
- Increased surface water flows in local creeks, which provides improved conditions for wildlife habitat, cold fresh water habitat, fish migration, fish spawning, preservation of biological habitats of special significance, commercial and sport fishing, and rare, threatened, or endangered species.

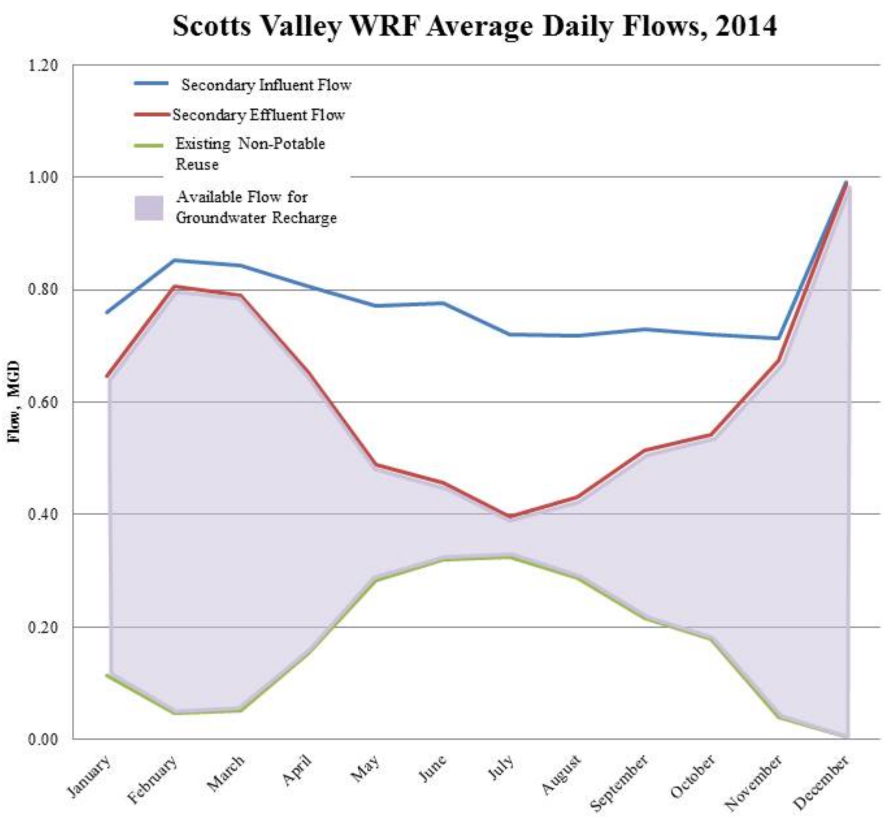
While active groundwater replenishment directly benefits SVWD, the benefits are also potentially regional and could apply to the members of the SMGBAC, the general community, regional stakeholders including the City and environmental regulatory agencies.

Purified Water is a Drought Proof Source for Replenishment

This Facilities Planning Report (FPR) evaluates the use of advanced purified recycled water as a local, reliable, drought-proof source of water supply for active groundwater replenishment in the Lompico aquifer of the SMGB. The Phase 1 Conjunctive Use and Enhanced Aquifer Recharge Project (Conjunctive Use Study), completed in 2011, evaluated other sources of water and methods to increase groundwater levels the SMGB such as in-lieu recharge and enhanced stormwater percolation. The Conjunctive Use Study recommended further exploration of stormwater recharge, inter-district potable water exchanges for in-lieu recharge and the use of surface water diversions for aquifer recharge; however it did not explore opportunities for recharge with recycled water as the regulations at that time were not yet developed.

The SVWD has a recycled water system that treats secondary effluent from the City of Scotts Valley Wastewater Reclamation Facility (WRF) to Title 22 standards for non-potable use. The City provides the treatment of the recycled water and the SVWD owns and operates the recycled water storage and distribution system. The SVWD owns the rights to up to 1 million gallons per day (MGD) of recycled water from the City's WRF and provides approximately 200 AFY to meet customer demands, primarily in the dry summer season. Figure 5 shows the average daily influent flows in 2014 to the WRF, recycled water demands for the Scotts Valley area, and remaining secondary effluent. The secondary effluent that is not supplied as recycled water is discharged to the Monterey Bay via the City of Santa Cruz's ocean outfall.

Figure 5: Available Recycled Water for Groundwater Replenishment



SVWD does not foresee a large increase in recycled water use in future years because of relative market saturation in the area served by the recycled water distribution system, where the most cost-effective non-potable reuse sites are already receiving recycled water. The majority of housing development in Scotts Valley is high density with very little irrigable land, thus there are limited opportunities to offset non-potable demands in the future with recycled water.

Additional non-potable reuse for irrigation is also limited by the available supply of recycled water in the summer months (Figure 5). Unlike non-potable reuse for irrigation, groundwater replenishment is not limited by seasonal demand, offering the ability to use excess flows from the WRF year-round. Table 1.1 shows the projected annual volume of water available for groundwater replenishment, with expected increases in non-potable recycled water use.

Even with estimated moderate increases in non-potable recycled water use, there is from 460 to over 570 AFY of recycled water is estimated to be available, once treated through advanced purification, to recharge the SMGB as shown in Table 1. An Advanced Purification Facility (APF), described below, would provide additional treatment to meet regulatory requirements for groundwater replenishment, and would operate through the fall, winter and spring, when non-potable recycled water demands are low. Injecting advanced purified recycled water in the Lompico aquifer of the SMGB would retain the water within the SMGB watershed for beneficial use.

Table 1: Estimated Volume Available for Groundwater Replenishment

Year	Estimated Ave Wastewater Flow, AFY	Estimated RW Demands with Existing and Future Customers, AFY(a)	Estimated Available Non-Recycled Wastewater, AFY(b)	Estimated Advanced Purified Water for GWR, AFY(c)
2015	874	200	674	546 (459)
2020	892	210	682	553 (466)
2025	911	220	691	559 (473)
2030	929	230	699	566 (479)
2035	947	240	707	573 (486)

(a) From 2015 Urban Water Management Plan, Pasatiempo GC demand of 107 AFY is not included

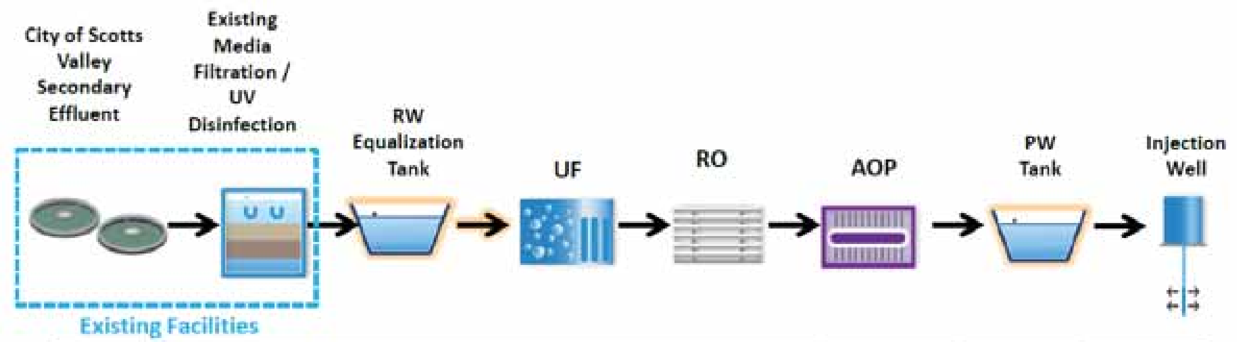
(b) Pasatiempo GC demand of 107 AFY is not included

(c) Supply Available is estimated to be 80% of the Estimated Available Non-Recycled Wastewater Flow, based on an 80% efficiency through treatment processes. Estimated APW with 107 AFY of Pasatiempo GC needs met is in parentheses; 475 AFY of APW is used for economic calculations in Table 4 to account for meeting Pasatiempo GC needs.

Advanced Purification Treatment Process

Recycled water would be treated through an advanced purification process which is described in the graphic that follows. The table accompanying the graphic indicates the potential log inactivation credits associated with the various process units to comply with Title 22 regulatory requirements for groundwater replenishment.

Figure 6: Advanced Purification Treatment for Groundwater Replenishment



	Target Process Log Removal / Inactivation Credits								
Treatment Processes	Scotts Valley WWTP	Scotts Valley WRF	UF	RO	UV/ AOP	Aquifer	Total Log Removal/ Inactivation	DDW Required Log Removal/ Inactivation	Additional Log Safety Factor
Pathogen									
Virus	1	4	0	1	6	6	18	12	6
Giardia	1	1	4	1	6	0	13	10	3
Crypto	1	1	4	1	6	0	13	10	3

Recommended Project

The recommended project for meeting the objectives of the SVWD is a groundwater replenishment project using advanced treated purified water. The following Alternavites Screening Evaluation Table summarizes the qualitative benefits of the different project alternatives by color. The dark green color is more favorable, green is favorable, and yellow, orange and red are increasing degrees of lower benefit.

Table 2: Screening Evaluation of Alternatives

Alternative	Quantity of Potable Water Produced/ Used	Cost of Water Delivered	Ease of Implementation	Environmental Benefits	Regional Benefits	Robustness against Climate Change Impacts
Local Irrigation Reuse	Medium	High	High	Low	Low	High
Expanded Irrigation Reuse	Low	High	Medium	Low	Medium	High
APF at Scotts Valley WRF and Groundwater Recharge (Alternative 1)	High	Low	Medium	Medium	High	High
APF at Hanson Quarry and Groundwater Recharge (Alternative 2)	High	Low	Low	Medium	High	High
APF at El Pueblo and Groundwater Recharge (Alternative 3)	High	Low	High	Medium	High	High
City of Santa Cruz Interconnection	Medium	Medium	Low	Low	Medium	Low to Medium
Stormwater Diversion and Delivery to Hanson Quarry	Low	Medium	High	Low	Low	Medium
Surface Water Diversion from Felton Diversion	Medium	Medium	Low	Medium	Medium	Low to Medium
Water Conservation/ Reduction	Low	High	High	Medium	Low	High
No Project Alternative	Low	High	High	None	None	Low to Medium

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The estimated planning-level capital and O&M costs for the three alternatives with advanced purification were analyzed in Section 10 and are summarized as follows in Table 3. Alternative 2 has four variations:

Table 3: Summary of Capital and Annual O&M Costs

Capital Cost Components	Alternative					
	1	2a	2b	2c	2d	3
APF (Treatment Facility)*						
Advanced Purification Facility	7.63	6.98	6.98	6.98	6.98	6.98
Pump Stations	0.32	0.55	0.66	0.54	0.65	0.52
Additional Facility (Electrical, Controls, Yard Piping)	2.94	3.65	3.68	3.82	3.68	2.04
Subtotal (million $)	***10.89***	***11.18***	***11.32***	***11.34***	***11.31***	***9.54***
Other Infrastructure*						
Storage	1.00	0.92	0.92	0.92	0.92	0.42
Pipelines	1.61	1.66	2.67	1.42	2.42	1.26
Groundwater Wells	1.78	1.78	1.78	1.78	1.78	0.80
Subtotal (million $)	***4.39***	***4.36***	***5.37***	***4.12***	***5.12***	***2.48***
Project Administration**						
Engineering/Construction Management, Legal, Administrative	2.70	2.70	3.00	2.70	2.90	2.10
CEQA, Permitting, Outreach	1.50	1.50	1.50	1.50	1.50	1.30
Subtotal (million $)	***4.20***	***4.20***	***4.50***	***4.20***	***4.40***	***3.40***
Land Acquisition	**TBD**	**TBD**	**TBD**	**TBD**	**TBD**	**0**
Total Capital Costs (million $)	**19.48**	**19.74**	**21.19**	**19.66**	**20.83**	**15.42**
Total Annual O&M ($)	**491,920**	**516,810**	**534,660**	**544,060**	**532,980**	**489,090**

The annualized per acre-foot costs, based on up to 1 MGD facility to meet winter flows for the three APF alternatives , for a project yield of 475 AFY as described in Table 1, which accounts for a reduced APW availability because of diversions to Pasatiempo GC, are summarized in Table 4.

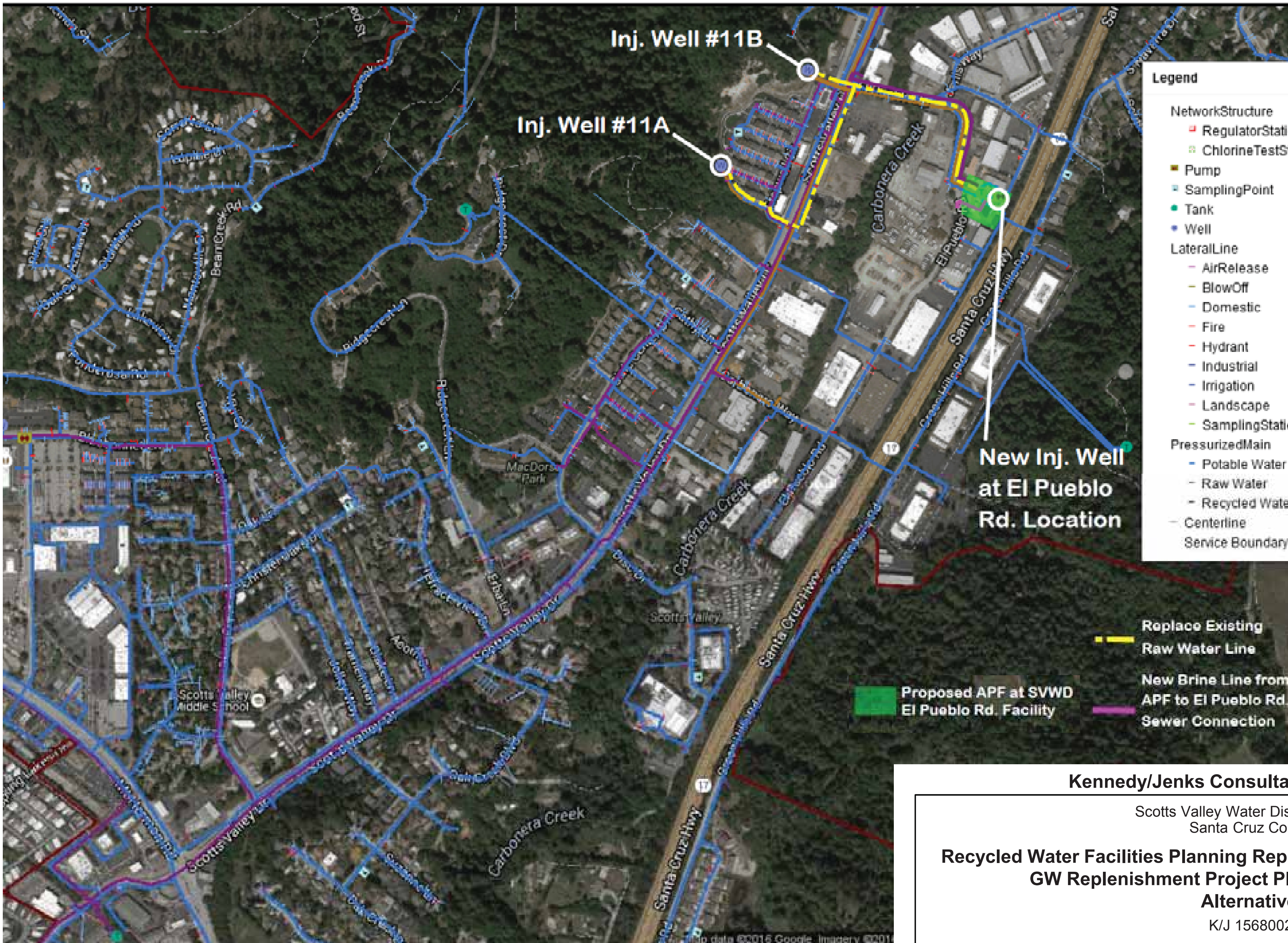
Table 4: Summary of Annualized Per Acre-foot Costs

Annualized Per Acre-foot Cost	Alternative					
	1	2a	2b	2c	2d	3
Capital Cost*	$1,430	$1,450	$1,580	$1,450	$1,540	$1,140
O&M Cost	$1,040	$1,090	$1,130	$1,150	$1,120	$1,030
Total ($/AFY)	$2,470	$2,540	$2,710	$2,600	$2,250	$2,170

* Assumes an estimated annual project yield of 475 AFY to account for a reduction as a result of meeting Pasatiempo GC demand, a project life of 30 years and an interest rate of 2%.

Recommended Groundwater Replenishment Alternative 3

Groundwater replenishment Alternative 3, where the APF facilities are located at the Scotts Valley El Pueblo Site, is the recommended project alternative. The El Pueblo site has some existing infrstructure that can be reused, including reuse of existing SVWD Wells 11A and 11B for injection. This alternative is shown on Figure 7 below.



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Scotts Valley Water District
Santa Cruz County

Recycled Water Facilities Planning Report
GW Replenishment Project Plan
Alternative 3

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Figure 7

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Section 1. Introduction

The purpose of this Facilities Planning Report (FPR) is to evaluate the potential for expanding the use of recycled water by developing a Groundwater Replenishment (GWR) Program for the Santa Margarita Groundwater Basin (SMGB). The Scotts Valley Water District (SVWD or District) operates a recycled water system that has limited additional supply in the summer months when irrigation demand is high and excess recycled water available in the winter and shoulder months when irrigation demand is low. With additional treatment to meet regulatory requirements; the excess flows would provide a local, reliable, drought-proof source of water supply for active groundwater replenishment. GWR would be accomplished through the injection of advanced purified recycled water into the Lompico aquifer of the SMGB in Scotts Valley, California. This FPR describes and evaluates the SMGB GWR Project (Project).

SVWD collaborated with local and regional stakeholders to prepare this FPR. The stakeholders included staff or representatives from the following agencies and groups:

- City of Scotts Valley (City)
- County of Santa Cruz (County)
- City of Santa Cruz Water Department (SCWD)
- San Lorenzo Valley Water District (SLVWD)
- Mount Hermon Association (MHA)
- Santa Margarita Groundwater Basin Advisory Committee (SMGBAC)
- California Division of Drinking Water (DDW)

1.1 Previous Studies

1.1.1 SVWD Recycled Water Facilities Planning Report (2009)

The SVWD completed a recycled water FPR in 2009, herein referred to as the 2009 FPR, (Kennedy/Jenks, 2009) that primarily focused on expansion of the existing recycled water irrigation system for non-potable reuse. Due to the economic climate at the time, the requirements of the Proposition 50 Grant funds, and the availability of District funds; the recommended plan in the 2009 FPR was to:

1. Continue to pursue infill customers along the existing recycled water pipeline alignments, with a potential to add approximately 140 acre-foot per year (AFY) of new demand.

2. Expand recycled water system by 3,600 feet of new pipelines to serve customers along the Victor Technology Loop, Hacienda Drive and Bean Creek to serve five new customers, with an estimated annual demand of 44 AFY.

The District has completed a number of recycled water irrigation system expansions as recommended in the 2009 FPR, increasing recycled water deliveries from 150 AFY in 2009 to approximately 200 AFY today. While groundwater replenishment with recycled water was considered in the 2009 FPR, there were many uncertainties that limited the feasibility of a groundwater replenishment project in 2009, due to anticipated diluent water requirements, uncertainty related to groundwater replenishment regulations and costs.

1.1.2 Phase 1 Conjunctive Use and Enhanced Aquifer Recharge Project (2011)

The SVWD has also supported and participated in the County of Santa Cruz's efforts to determine the feasibility of artificial and enhanced recharge in closed quarries in the vicinity of the SVWD. Under the Proposition 50 Integrated Regional Water Management (IRWM) Program Implementation Grant, the Phase 1 Conjunctive Use and Enhanced Aquifer Recharge Project (Conjunctive Use Study) was completed (Kennedy/Jenks, 2011) to evaluate methods to increase groundwater levels in the southern Santa Margarita Groundwater Basin with a primary focus on the Scotts Valley area. The Conjunctive Use Study screened a variety of potential groundwater replenishment alternatives with the goal of identifying viable projects to provide the following benefits:

- Increase the amount of groundwater in storage to improve water supply reliability,
- Improve summer baseflow in nearby streams to improve fishery conditions, and
- Reduce stormwater runoff.

The Conjunctive Use Study included the following recommended approaches for groundwater replenishment:

- Enhanced Stormwater Recharge in Scotts Valley Using Low Impact Development (LID)
- Inter-District Potable Water Exchange for In-Lieu Recharge
- Surface Water from Felton Diversion for Aquifer Recharge in Hanson Quarry Area

The SVWD has worked with regional stakeholders to implement LID stormwater recharge and local system intertie pipeline projects based on the recommendations of the Conjunctive Use Study. While the Conjunctive Use Study also considered the use of recycled water for groundwater replenishment, the groundwater recharge regulations, geologic understanding of the area, and land ownership at the time of the report posed significant challenges to the concept (Kennedy/Jenks, 2011).

1.1.3 Regulations, Tools and Land Ownership

The following recent developments now make groundwater replenishment of the Lompico aquifer with advanced purified recycled water more feasible and have led to the development of this FPR:

- The State Water Resources Control Board (SWRCB) Division of Drinking Water (DDW)[1] issued final groundwater recharge regulations on June 18, 2014, revising and clarifying the requirements for injection of purified recycled water.
- The Santa Margarita Groundwater Basin, Hydrogeologic Groundwater Model was significantly refined in 2014, providing a means to evaluate the impacts and benefits of purified water injection.
- The land ownership circumstances of the Hanson Quarry property have changed in the past few years and there is improved potential for implementing groundwater replenishment facilities at the Quarry or other nearby sites. The Hanson Quarry property has ceased operations as a quarry and regional stakeholders are discussing opportunities for the property to be transitioned for potential uses such as a regional park, limited housing development, and open space. The SVWD and regional stakeholders have also identified the potential for groundwater replenishment facilities on a portion of the Hanson Quarry property.

1.2 Requirements of the SWRCB Facilities Planning Grant

This FPR is funded in part by a SWRCB grant and addresses the required elements of the Recycled Water FPR outline provided by the SWRCB. The evaluation builds on previous recycled water facilities planning studies and other regional studies that have evaluated the potential for groundwater replenishment.

[1] The Potable water Program for CDPH moved to the SWRCB and was renamed the Division of Potable water (DDW) as of July 1, 2014.

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Section 2. Study Area Characteristics

This section provides a description of study area characteristics, including project setting, hydrologic features, groundwater basins, water quality, land use and land use trends, population projections, and beneficial uses of receiving waters.

2.1 Project Setting

The City of Scotts Valley, California (City) is a small community nestled in the Santa Cruz Mountains along Highway 17 at the southern part of the SMGB. The city is located in Santa Cruz County, south of the San Francisco Bay Area and near the Pacific Ocean, as shown on the vicinity map on Figure 2-1. The area has a Mediterranean climate with a cool, dry summer and a wet winter. The average annual rainfall for the period from 1982-2015 is 41.53 inches but can range from 20 to 80 inches. The SMGB is located in a seismically active area west of the San Andreas Fault zone on the Scotts Valley Syncline.

The community in and around Scotts Valley includes schools, commercial, light industrial, residential, and recreational areas. Scotts Valley is served by the SVWD, a public agency that manages and supplies water to an estimated 10,600 people in the City and adjacent unincorporated areas of the County as of 2016. Other regional water supply entities and authorities in the SMGB include the San Lorenzo Valley Water District, MHA, and Santa Cruz County. The total population in the SMGB area is estimated to be 40,000 people.

SVWD has worked in cooperation with the City of Scotts Valley to develop a water recycling program for the Scotts Valley area where the City produces the recycled water at the Scotts Valley Water Reclamation Facility (WRF) and SVWD distributes it to customers. The SVWD owns the access rights to the recycled water by agreement with the City.

The boundaries of the SVWD, the City of Scotts Valley, the San Lorenzo Water District, MHA and Santa Cruz County, as well as other districts that are part of the Northern Santa Cruz County Integrated Regional Water Management Plan are illustrated on Figure 2-2.

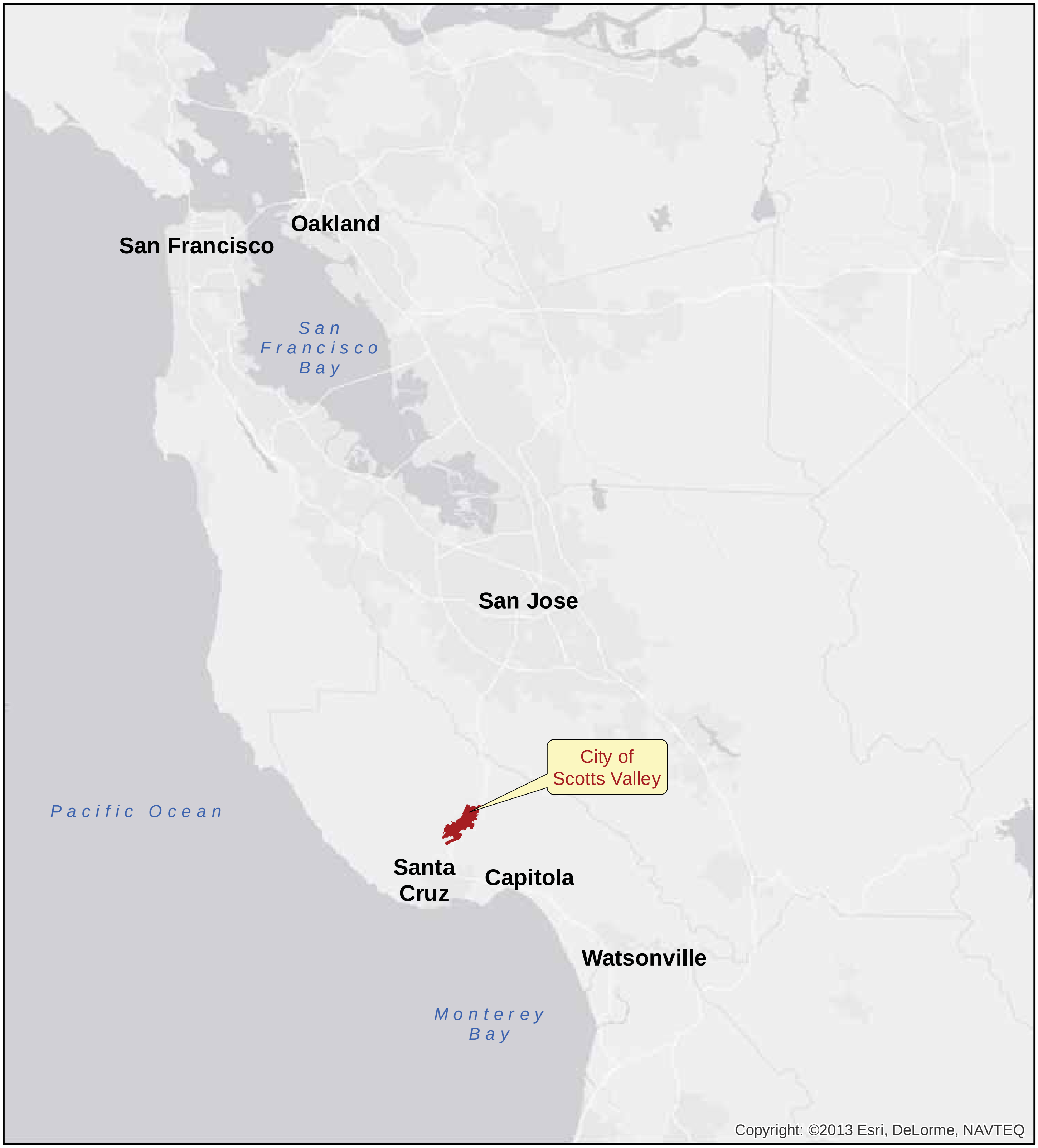
2.1.1 Topography

The topography of the Scotts Valley area is rugged, with surface elevations ranging from 280 feet at the mouth of Bean Creek to 1,875 feet in the mountains to the North and East as shown on Figure 2-3.

2.1.2 Study Area Boundaries

The study area boundary for supply of recycled water for is delineated on Figure 2-4, and is defined as the SVWD service area and a corridor extending west of the District service to include San Lorenzo River access and the Hanson Quarry property. The benefits of the groundwater replenishment may extend over the entire SMGB boundary, shown on Figure 2-5.

Document Path: Z:\Projects\Scotts_Valley_Water_District\Events\20150610_2015ReportFigures\F 2-1 Scotts Valley Vicinity Map.mxd



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Scotts Valley Water District
Santa Cruz County

Recycled Water Facilities Planning Report
Scotts Valley Vicinity Map

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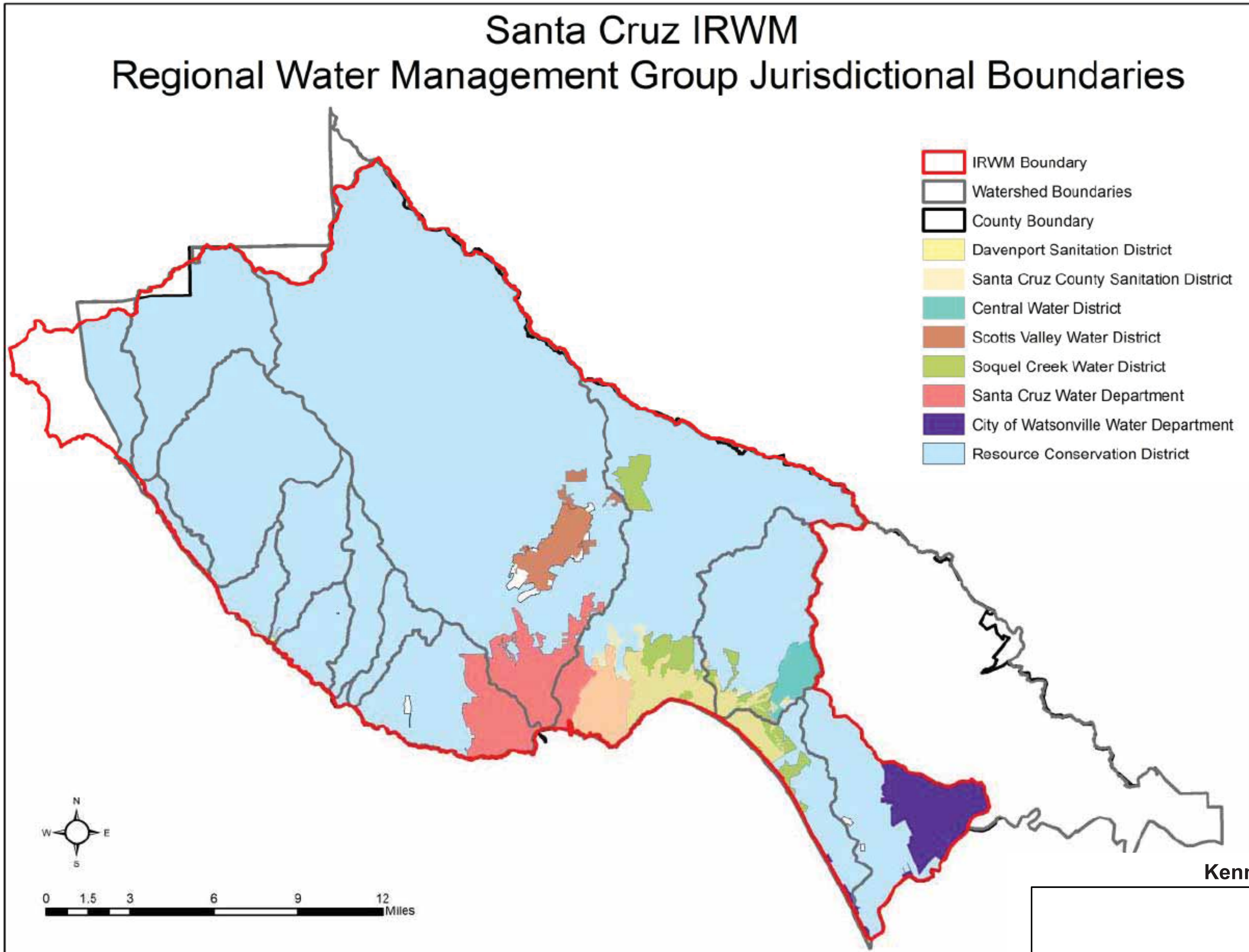
Figure 2-1



From Santa Cruz IRWM Plan, 2014

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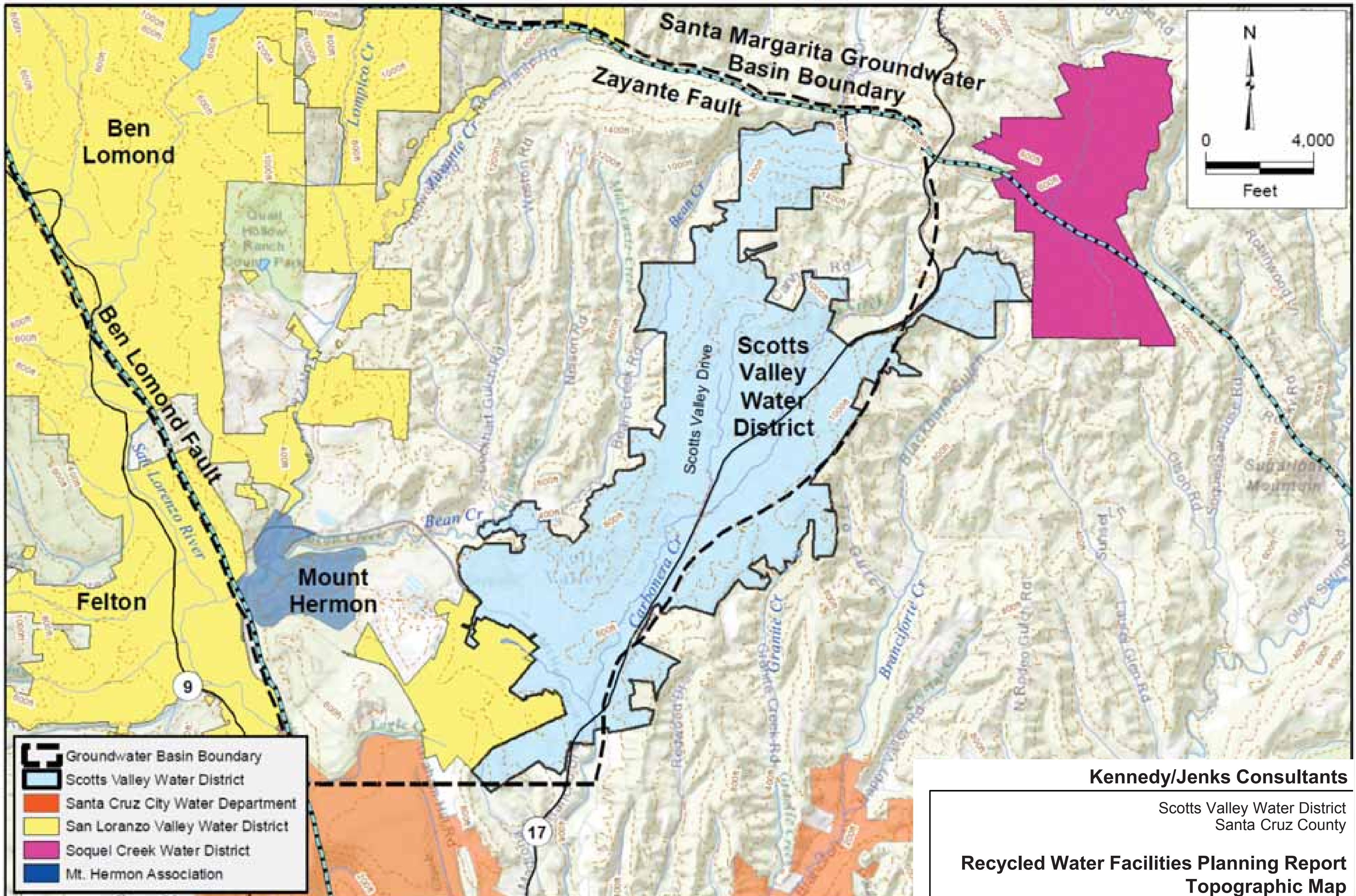
Scotts Valley Water District
Santa Cruz County

Recycled Water Facilities Planning Report
Scotts Valley Regional Setting

K/J 1568002*01

Figure 2-2



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Santa Cruz County

Recycled Water Facilities Planning Report
Topographic Map

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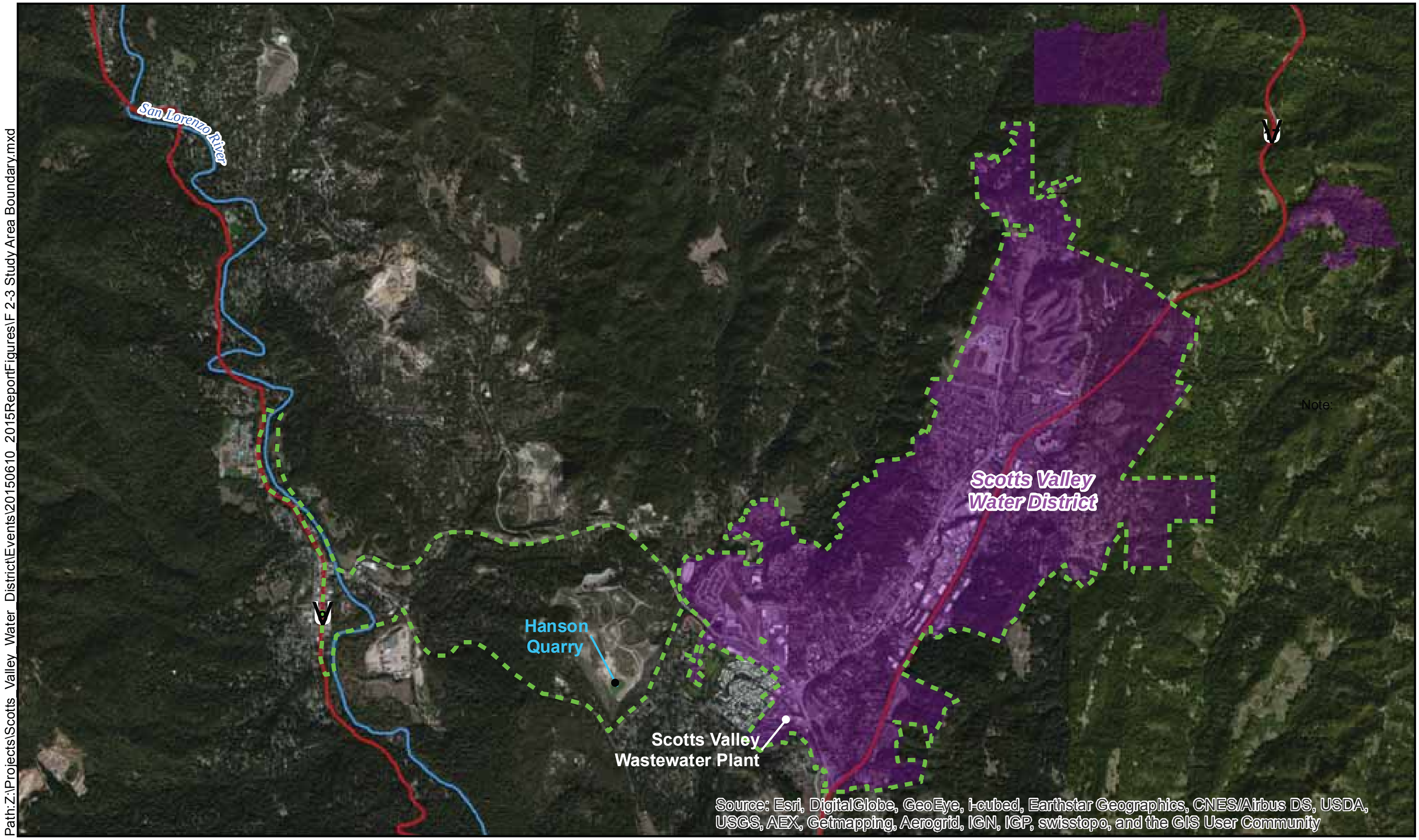
Figure 2-3



LEGEND

Recycled Water Study Area

Scotts Valley Water District

0 0.5 1

Scale: Miles

Kennedy/Jenks Consultants

Scotts Valley Water District
Santa Cruz County

Recycled Water Facilities Planning Report
Study Area Boundary

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Figure 2-4

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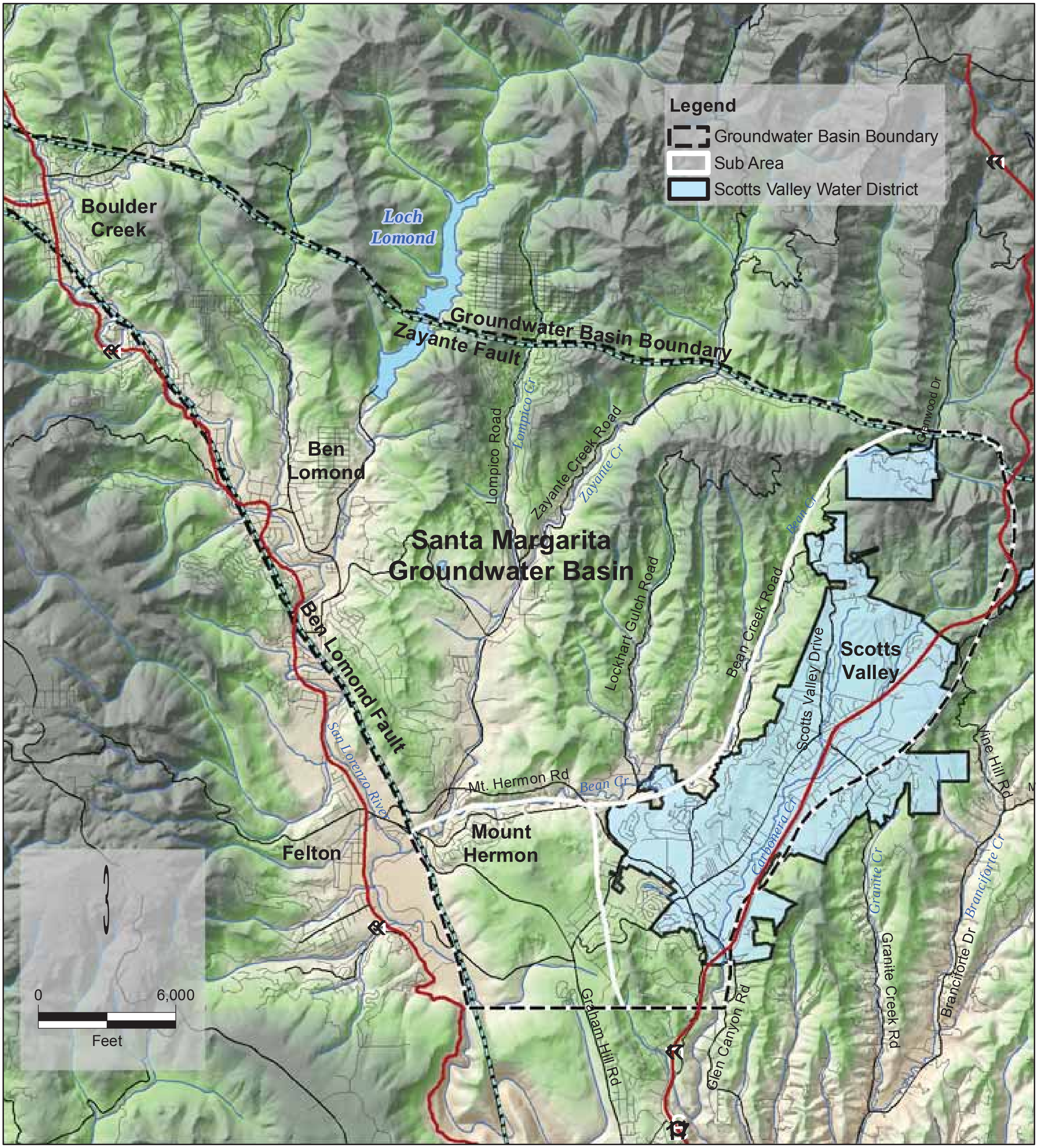

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Santa Cruz County

Recycled Water Facilities Planning Report
Scotts Valley Groundwater Basins and Hydrologic Features

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Figure 2-5

2.1.3 Existing Recycled Water Facilities

Existing facilities for the SVWD Recycled Water Program include the following:

- Disinfected tertiary treatment at the Scotts Valley WRF, capable of producing up to 1 million gallons per day (MGD) of recycled water.
- Recycled water pumping at the Scotts Valley WRF and on Scotts Valley Drive northeast of Glenwood Drive near Highway 17 at the Siltanen Booster Station.
- 0.6 Million Gallons (MG) of recycled water storage located above Scotts Valley High School near the end of Cass Way.
- High pressure distribution 6- and 8-inch diameter mains along Scotts Valley Drive.
- Pressure reducing valve (PRV) and low pressure Mt Hermon 8-inch distribution main.
- Service lines to recycled water sites.

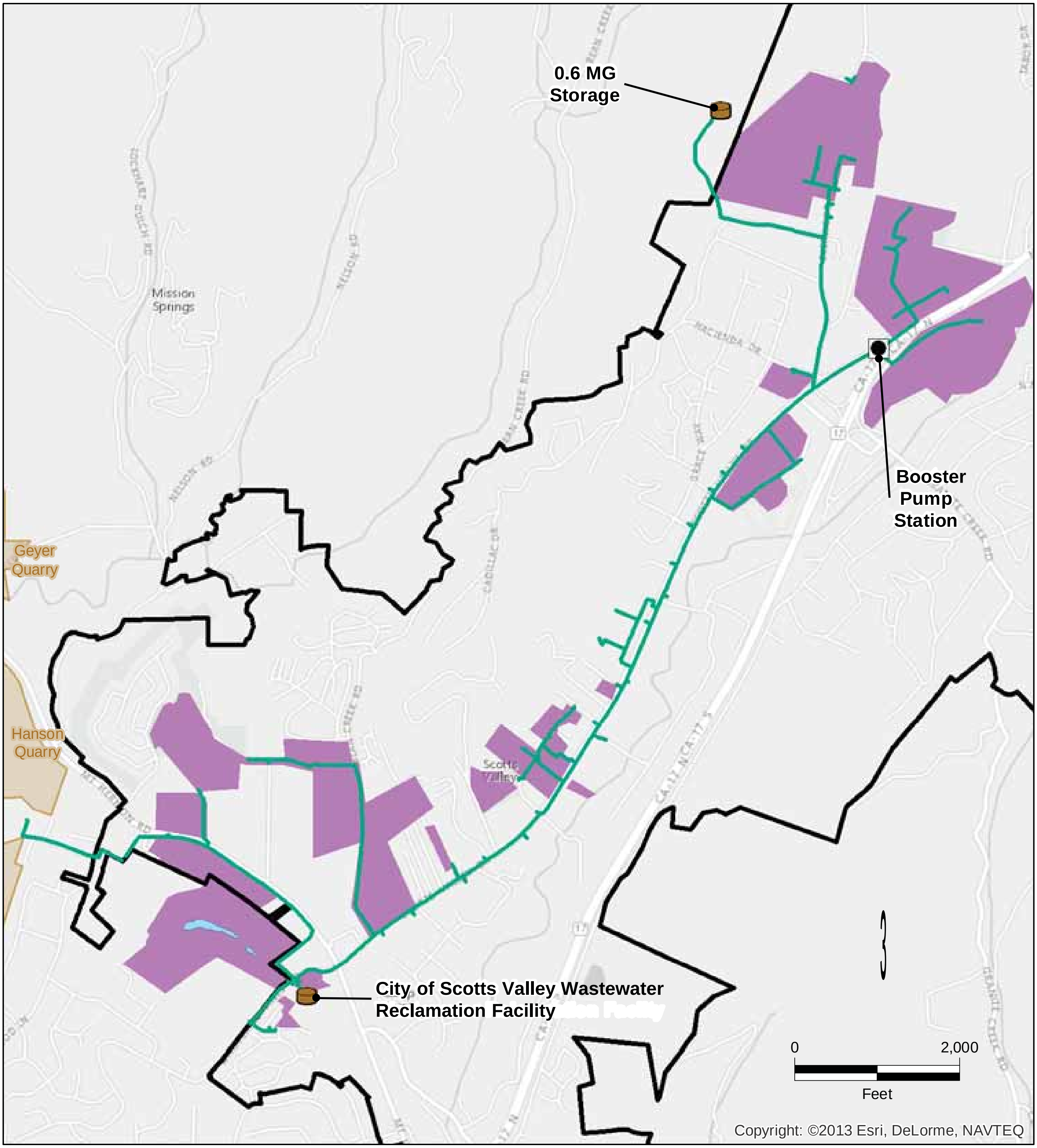
The existing recycled water system includes approximately 6 miles of recycled water pipeline and provides an annual average demand supply of approximately 200 AFY of recycled water to 51 sites. Current recycled demands are primarily in the summer months for irrigation. Secondary treated water from the WRF that is not treated for recycled water is discharged to the Pacific Ocean through the Santa Cruz ocean outfall.

Figure 2-6 depicts the SVWD existing recycled water system, including the treatment plant, distribution lines, pump stations, storage tank, pressure reducing station and the current recycled water customers in the SVWD service area.

2.2 Hydrologic Features

The SMGB study area includes three surface water bodies. Bean Creek and Carbonero Creek are tributaries to the San Lorenzo River and are groundwater recharge/discharge locations of the SMGB. A segment of the San Lorenzo River in the community of Felton is included in the study area. SVWD and the MHA obtain their potable water exclusively from groundwater and do not use either of the creeks or the river for source water. SLVWD and other smaller water districts obtain a portion of their water from surface water in the watershed.

Bean Creek has a watershed area of about 6,400 acres while Carbonero Creek has a watershed area of about 3,300 acres (EOA, 2000). Other hydrologic features include seeps and springs, including Ferndell Spring, Redwood Spring and Eagle Creek. A more detailed description of hydrology is included in the Engineering Report (EOA, 2000). Figure 2-5 also identifies major streams and hydrologic features in the study area.



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Legend

- Pump
- Tank
- Pressure Main
- Scotts Valley Water District
- Existing Recycled Water Customers
- Quarry Location

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Scotts Valley Water District
Santa Cruz County

Recycled Water Facilities Planning Report
Existing Recycled Water Facilities

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Figure 2-6

2.3 Groundwater Basins

The SVWD overlies portions of the North and South Scotts Valley Sub-areas which includes the Lompico, Santa Margarita and Butano aquifers; these sub-areas are a portion of the SMGB. Figure 2-5 identifies the groundwater basin boundaries in the study area. A description of these aquifers is provided in the following sections.

Since 1983, the District has actively monitored and managed the Basin through an integrated climatic, surface water and groundwater monitoring program, regular reporting of water conditions. The District and regional partners have also conducted a safe yield study, implemented a recycled water program, implemented stormwater recharge LID projects, assessed of artificial recharge and water transfer options, and developed a regional groundwater numerical model. A groundwater management plan documenting these efforts was originally adopted in July 1994 and annual groundwater reports are prepared that describe conditions on a year-to-year basis.

Prior to 1980, groundwater levels in the Scotts Valley area were generally higher than those in most of the rest of the Santa Margarita Basin. Therefore, the Scotts Valley area was a major recharge area for the basin, and groundwater flowed outward to the surrounding areas. After 1980, a variety of factors contributed to the observed groundwater level declines. The major factors include; (1) increased groundwater pumping to meet the water demand of a growing population, (2) reduced recharge from the surface to groundwater due to an increase in paved areas and other land use changes associated with urbanization, and (3) reduced groundwater recharge due to the drought of the late 1980s and early 1990s. A significant portion of the groundwater storage in the Santa Margarita aquifer was depleted during this time and has not recovered sufficiently to be considered a viable source of supply for SVWD. Production in other aquifers has been developed to replace the Santa Margarita aquifer supply (Kennedy/Jenks, 2011).

Precipitation, in the form of rainfall, is the primary source of groundwater recharge in the Basin. Groundwater recharge occurs from both the direct percolation of rainfall through the soil and the infiltration of runoff through streambeds. The major groundwater outflows include discharge to streams and springs and groundwater pumping. Groundwater users include SVWD, SLVWD, MHA, SCWD, remediation users and private users (Kennedy/Jenks, 2011; Kennedy/Jenks, 2015),

Groundwater pumping from the Santa Margarita Groundwater Basin from 2009 to 2105 is shown in Table 2-1. Withdrawals during this period were below the sustainable yield of 2,600 AFY (ETIC, 2006).

Table 2-1: Santa Margarita Basin Withdrawals (AFY)

	2009	2010	2011	2012	2013	2014	2015
SVWD Withdrawals[1]	1,507	1,357	1,292	1,351	1,400	1,376	1,133[3]
Total Withdrawals [2]	2,410[1]	2,233[1]	2,178[1]	2,231[1]	2,319[1]	2,261[1]	--[3]

[1]2014 Annual Report (Kennedy/Jenks, 2015a).
[2]Includes SLVWD and other users in for the portion of the Santa Margarita Basin in the vicinity of Scotts Valley.
[3]2015 Annual Report (Kennedy/Jenks, 2016a). – Total withdrawals not reported in 2015 Annual Report

2.3.1 Santa Margarita Sandstone Aquifer

The Santa Margarita Sandstone is the shallowest aquifer in the SVWD area and currently is a source of only a small percentage of SVWD and SLVWD production. Water levels steadily declined in the 1970s and 1980s due to increased pumping but have stabilized since the late 1990s. The Santa Margarita Sandstone aquifer has high potential for groundwater recharge from precipitation due to the high permeability of the sandy soils and the shallow depth of the aquifer (ETIC, 2007). Rainwater that percolates into the shallow Santa Margarita aquifer is naturally discharged into Bean Creek and Carbonero Creek, and less of the percolated water reaches the lower Lompico aquifer.

An in-depth description of Santa Margarita aquifer and associated water level fluctuations and the results of the most recent assessment of groundwater conditions in the Santa Margarita aquifer are provided in the 2015 Annual Report (Kennedy/Jenks, 2016a).

2.3.2 Lompico Sandstone Aquifer

SVWD draws approximately 65% of its groundwater from the Lompico Sandstone aquifer, which lies below the Santa Margarita aquifer. SLVWD and MHA also draw a majority of their water from the Lompico aquifer. SLVWD also has access to surface water for portions of its service area. Since the 1980s, water levels have also declined significantly in the Lompico aquifer. Recent data indicates that the Lompico wells are able to sustain current pumping rates, which are below the estimated sustainable yield, and the Lompico aquifer levels have stabilized. However, groundwater levels are not recovering in response to the reduced groundwater pumping rates. This indicates that recharge of the Lompico by percolation of rainwater or other surface recharge is a very slow process, and that areas of the Lompico would be a good candidate for injection or in-lieu recharge.

An in-depth description of Lompico aquifer water level fluctuations and the results of the most recent assessment of groundwater conditions are provided in the 2015 Annual Report (Kennedy/Jenks, 2016a).

2.3.3 Butano Formation Aquifer

The deepest and least understood aquifer from which SVWD and other users pump is the Butano Formation aquifer. Pumping began in 1994 and SVWD currently draws approximately 21% of it groundwater from the Butano (Kennedy/Jenks, 2016a). Additional details about the Butano Aquifer can be found in the 2015 Annual Report (Kennedy/Jenks, 2016a).

2.4 Groundwater Quality

The major naturally-occurring constituents of concern for the local water agencies production wells include iron, manganese, total dissolved solids (TDS), sulfate, nitrate, and arsenic. Among the naturally-occurring constituents of concern, only arsenic and nitrate have concentration limits governed by primary Maximum Concentration Levels (MCLs). Concentrations of constituents that are not defined as public health risks, but require treatment for taste, odor, and aesthetic factors are regulated based on secondary MCLs. The water agencies in the SMGB monitor both raw and treated water quality of groundwater wells in accordance with Safe Drinking Water Act requirements, and reports results to the DDW. Additionally, the Central Coast Regional Water Quality Control Board (CCRWQCB) monitors several contaminated plumes in the groundwater basin that are in the process of being remediated, to ensure the drinking water quality is not compromised. Section 3.7 provides an additional discussion of water quality.

2.5 Land Use and Land Use Trends

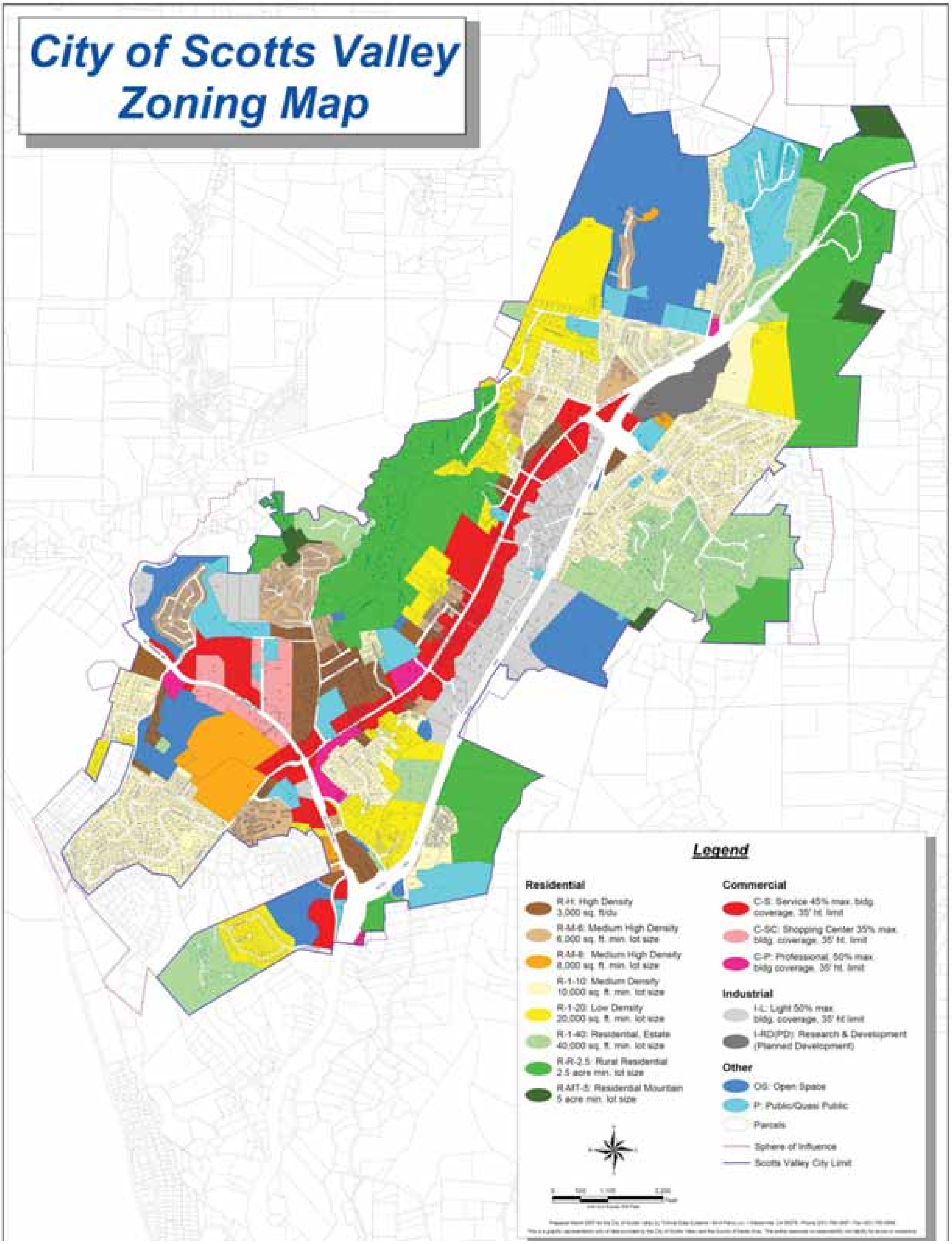
Based on the Scotts Valley General Plan, the land zoning in the vicinity of Scotts Valley is primarily residential but includes some light industrial, commercial and open space areas, as shown on Figure 2-7. The heavily developed area lies primarily along Highway 17, while the forested hillsides are mostly reserved for rural residential or open space development.

2.6 Population Projections of Study Area

According to the US Census Bureau, the City of Scotts Valley had a population of 11,580 in 2010, which was a 2 percent increase from the 2000 population of 11,385. The Association of Monterey Bay Area Governments (AMBAG) regional growth forecast has estimated that the population of Scotts Valley will increase 2% between 2010 and 2035. This is substantially lower than the Santa Cruz County estimated population growth of 18% over the same 25 year period. AMBAG also estimated Scotts Valley to have a 4% increase in the number of households between 2010 and 2035. The corresponding county-wide increase in households is 15%. (AMBAG, 2014) The population of the overall SMGB area is approximately 40,000 and is projected to grow at higher rates than the City of Scotts Valley.

2.7 Beneficial Uses of Receiving Waters

The Central Coast Region Basin Plan (Basin Plan) (CCRWQCB, 2011) identifies the beneficial uses of waters of the State. The Basin Plan describes beneficial uses and water quality objectives for



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Santa Cruz County

Recycled Water Facilities Planning Report
Scotts Valley Zoning Map

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Figure 2-7

surface water and groundwater within the study area. Effluent limitations and discharge prohibitions are also described in the Basin Plan.

The beneficial uses for local surface and ground waters are; municipal and domestic supply, agricultural supply, industrial service supply, groundwater recharge, freshwater replenishment, water contact recreation, non-contact water recreation, wildlife habitat, cold fresh water habitat, fish migration, fish spawning, preservation of biological habitats of special significance, commercial and sport fishing, and rare, threatened, or endangered species.

Secondary effluent from the Scotts Valley WRF that is not treated to tertiary standards for recycled water use is pumped out of the watershed via the City of Santa Cruz's existing ocean outfall pipeline and discharged to the Monterey Bay. Wastewater discharge requirements and specific water quality objectives are described further in Section 4:

Section 3. Water Supply Characteristics and Facilities

Water supply characteristics and facilities for the SVWD are described in the 2015 UWMP (Kennedy/Jenks, 2016b). The 2015 UWMP includes activities related to water management and water conservation for the period from 2010 through 2015, and outlines the District's projected activities through 2040.

The SVWD Recycled Water Program and increased conservation efforts by SVWD have resulted in reduced potable water demands since 2003, when potable water use peaked. This has resulted in corresponding reduced groundwater extractions from the Lompico and Butano aquifers. The recent drought and additional conservation efforts have also resulted in an observed decrease in recycled water use.

3.1 Wholesale and Retail Entities

SVWD is a retailer that supplies water to the majority of the City of Scotts Valley, as well as nearby unincorporated areas in Santa Cruz County. SVWD has no current or future plans to acquire wholesale water from a wholesale water agency. The District does not sell or export water to any other water purveyor or water supplier. There is potential for future water purchases or exchanges with the SCWD for in-lieu recharge. (Kennedy/Jenks, 2011).

Other water purveyors in the area include the SLVWD, which recently merged with the Lompico County Water District, MHA, and SCWD as shown on Figure 3-1.

SVWD is also the owner and operator of the recycled water storage and distribution system for Scotts Valley, previously shown on Figure 2-6. SVWD manages the distribution of recycled water and is responsible for all customer service. SVWD also serves as the recycled water retailer, administrator for permits and funding activities for recycled water facilities, and oversees the design and construction of storage tanks and distribution pipelines. The SVWD owns the water rights to the recycled water.

The City of Scotts Valley manages the Scotts Valley WRF, which produces secondary effluent that is discharged to the Pacific Ocean and disinfected tertiary treated recycled water that meets Title 22 water recycling criteria for non-potable use. The City oversees the design, construction, operation and maintenance of the wastewater treatment and recycled water treatment facilities. The agreements between SVWD and the City governing recycled water are included in Appendix A.

3.2 Sources of Water

Water supplies for the SMGB are solely derived from rainwater that percolates into the local groundwater basin. The region does not import any water into the basin area, such as from State or Federal Water Projects. Thus, there are a limited number and type of additional water supplies

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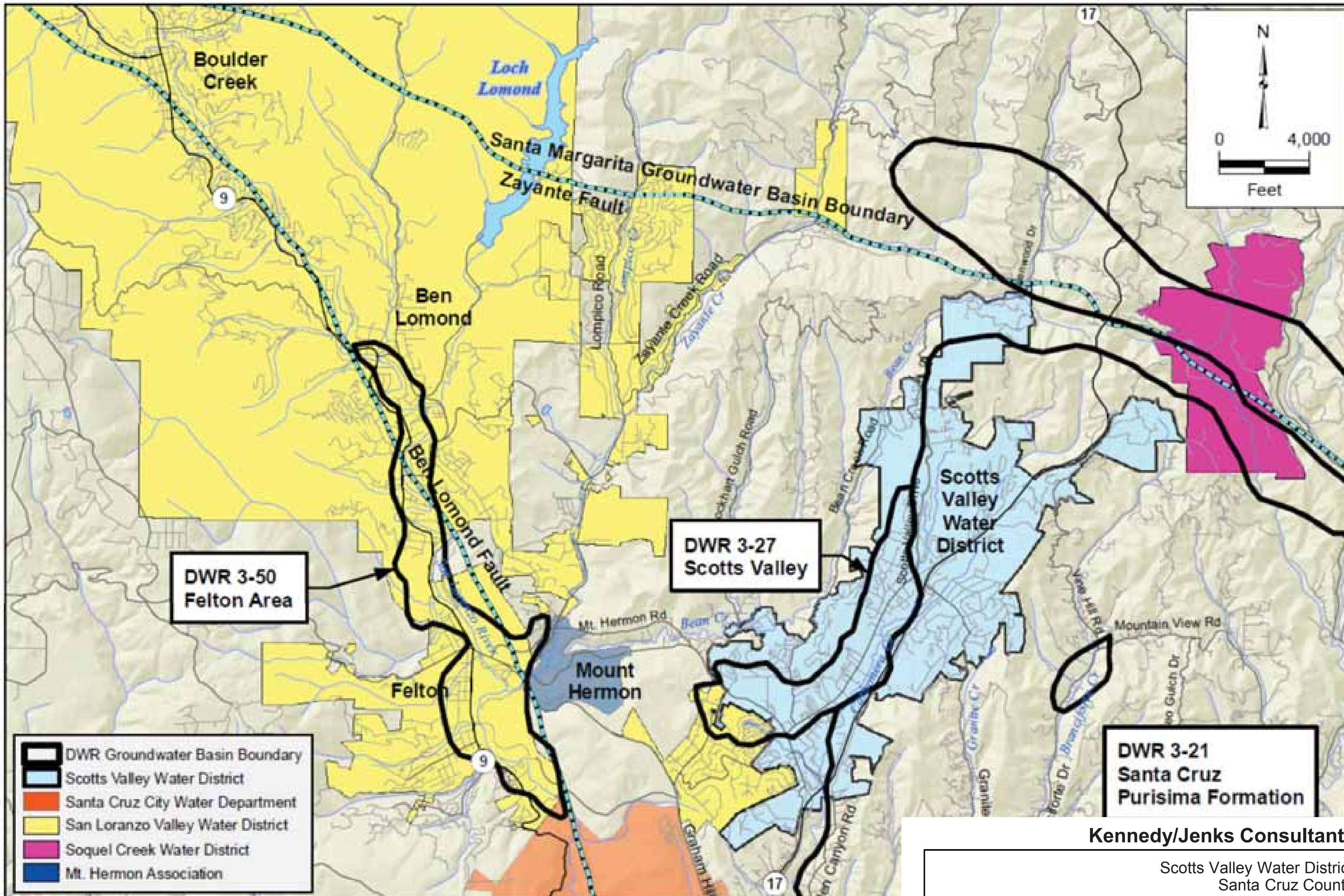

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Santa Cruz County

Recycled Water Facilities Planning Report
Wholesale and Retail Water Supply Entities

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Figure 3-1

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available to the water agencies in the SMGB area. Tertiary disinfected recycled water is a non-potable source of water suitable for specific Title 22 uses. Advance purified recycled water could be a new source of water to help recharge and replenish the local groundwater aquifers, serving as an indirect potable supply.

3.2.1 Groundwater

The District currently obtains all of its potable water supply from the aquifers of the SMGB. As a result, the Basin has been designated as a Sole Source Aquifer by the United States Environmental Protection Agency (USEPA).

The SMGB covers approximately 30 square miles and includes the Lompico, Santa Margarita and Butano aquifers that the District overlies. The locations of the District's groundwater wells are illustrated on Figure 3-2. The hydrogeological complexity of the Santa Margarita Groundwater Basin along the regional cross sectional line in the Scotts Valley area is illustrated on Figure 3-3.

The Lompico aquifer provided approximately 78% of SVWD withdrawals and the Butano aquifer accounted for approximately 21% of SVWD withdrawals in 2015. Production from the shallow Santa Margarita aquifer has decreased over time due to declining water levels, while production has increased in recent years in the Lompico aquifer.

SLVWD, MHA, and private pumpers regulated by Santa Cruz County also pump water from the basin and coordinate under the SMGBAC to monitor and manage the groundwater basin. Additional information about existing and future groundwater withdrawals can be found in the 2015 Annual Report (Kennedy/Jenks, 2016a) and the 2015 UWMP (Kennedy/Jenks, 2016b).

3.2.2 Surface Water

Bean Creek and Carbonero Creek, which are tributaries of the San Lorenzo River fall within the boundaries of the SVWD service area and are groundwater recharge/discharge locations of the SMGB. A portion of the San Lorenzo River is also included in the study area, although the SVWD does not hold surface water rights to these surface waters. SLVWD, Lompico County Water District, and the County of Santa Cruz have some surface water rights in the watershed. The City of Santa Cruz has surface water rights on the San Lorenzo River.

3.2.3 Recycled Water

The District's recycled water system includes treatment, storage, pumping and distribution pipelines. The system can produce up to 1 MGD of disinfected tertiary recycled water in the summer, high demand periods. In 2013 and 2014, total recycled water use was 200 AFY. In 2015, recycled water use dropped modestly, which is likely the result of drought-related conservation, while the number of connections increased. Recycled water represents approximately 14% of the total District water use. Nearly 90% of recycled water is delivered during the seven-month irrigation season, April through October.

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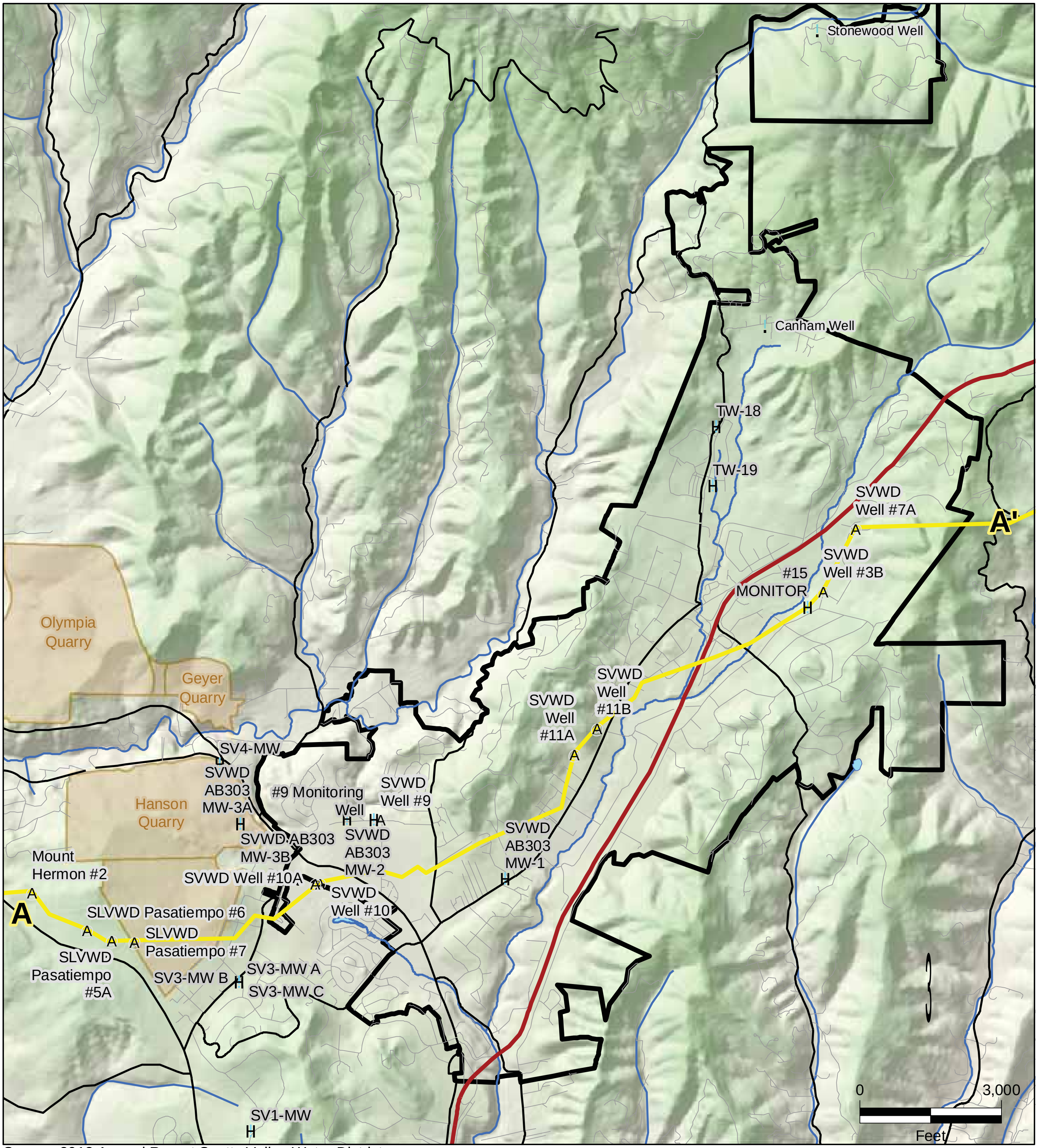

Source: 2013 Annual Report Scotts Valley Water District Groundwater Management Project, Kennedy/Jenks

Legend

- GWMP Groundwater Well Location
- Production Well Location
- Cross Section Line
- State Highways
- Major Roads
- Streets
- Streams
- Scotts Valley Water District
- Quarry Location

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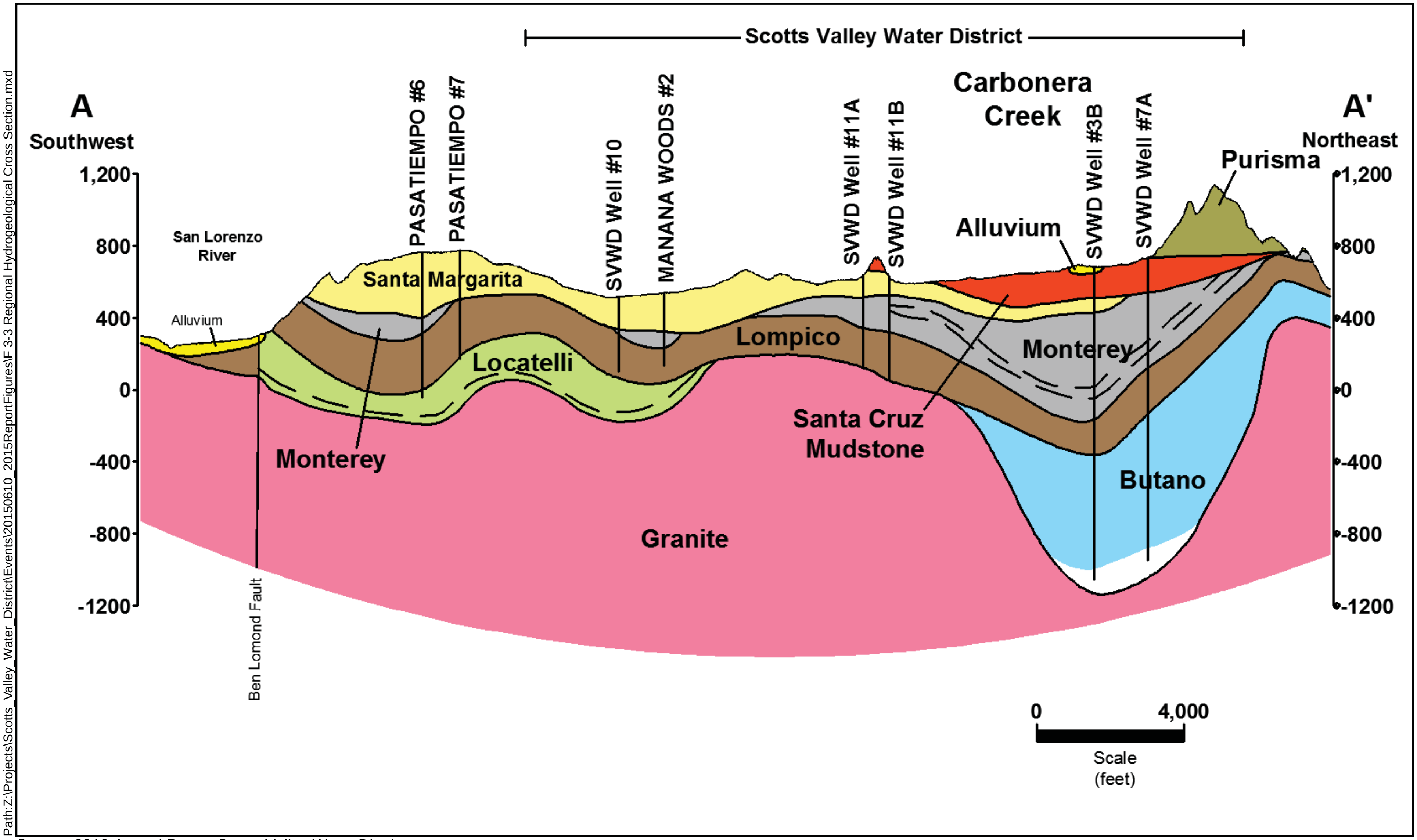
Santa Cruz County

Recycled Water Facilities Planning Report
Source of Ground Water for Study Area

K/J 1568002.01

Figure 3-2



Source: 2012 Annual Report Scotts Valley Water District Groundwater Management Program, Kennedy/Jenks

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Scotts Valley Water District
Santa Cruz County

Recycled Water Facilities Planning Report
Regional Hydrogeological Cross Section

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Figure 3-3

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3.2.4 Secondary Effluent

Secondary treated water from Scotts Valley is currently discharged to the Pacific Ocean through the City of Santa Cruz's ocean outfall, primarily in the winter when recycled water demands are very low. The secondary effluent that is currently discharged is a potential supply for reuse or aquifer recharge and the available flow is seasonally variable. Table 3-1 lists the monthly effluent flow that is potentially available for reuse or purification under current production and recycled water demand conditions. Table 3-2 provides the projected future average available flows. Table 3-3 provides the projected effluent available for reuse based on effluent flow projections and current recycled water demands. The values in Table 3-3 are used to size advanced treatment facilities.

Table 3-1: Scotts Valley WRF Secondary Influent Flow by Month, 2014

Month	Average Flow, MGD[a]	Minimum Flow, MGD[a]	Maximum Flow, MGD[a]
January	0.76	0.41	1.20
February	0.85	0.51	1.57
March	0.84	0.48	1.58
April	0.81	0.39	1.19
May	0.77	0.52	1.11
June	0.78	0.49	1.40
July	0.72	0.45	0.96
August	0.72	0.51	1.02
September	0.73	0.29	1.10
October	0.72	0.41	1.11
November	0.71	0.54	1.13
December	0.99	0.73	1.72

(a) Source: Scotts Valley WRF average daily flow by month–for 2014

Table 3-2: Scotts Valley WRF Estimated Secondary Influent Flow, 2015 - 2035

Year	MGD[a]	AFY[b]
2015	0.78	874
2020	0.80	892
2025	0.81	911
2030	0.83	929
2035	0.85	947

(a) Source: 2010 UWMP Table 4-2 with adjustments for reduced flows to reflect effects of water use efficiency measures

(b) The City of Scotts Valley has committed a maximum of 107 AFY of secondary effluent to Pasatiempo in the summer period for irrigation which will reduce, seasonally, the available flow

Note: 2015 UWMP did not project future wastewater flows

Table 3-3: Scotts Valley WRF Estimated Seasonally Available Flow for Purification(a), 2015 - 2035

	Dry Season		Wet Season	
Year	Available Flow Remaining After Meeting Peak Day RW Demand, MGD(b)	Available Flow Remaining After Meeting Average Day RW Demand, MGD(c)	Available Flow During Average Wet Weather Flow Conditions, MGD(d)	Available Flow During Peak Month Wet Weather Flow Conditions, MGD(d)
2015	0.33	0.53	0.80	0.88
2020	0.35	0.54	0.82	0.90
2025	0.36	0.56	0.84	0.92
2030	0.38	0.58	0.86	0.94
2035	0.40	0.59	0.88	0.96

(a) This table does not include meeting Pasatiempo GC demands; Table 9-3 provides values adjusted for Pasatiempo GC demand

(b) Based on Ave Flow, Table 3-2, adjusted to account for recent decrease in influent flow trends, and peak day recycled water demands.

(c) Based on Ave Flow, Table 3-2 adjusted to account for recent decrease in influent flow trends, and average day recycled water demands.

(d) Ave Wet Weather Flow is based on average flow for November - March from 2012-2014

(e) Peak Month Wet Weather Flow based on month with historically highest flow from 2012-2014

3.3 Current Water Supply Facilities

The District has 55 miles of potable water mains, eight potable water storage tanks, nine booster pump stations, six active production wells, and four potable water treatment facilities (SVWD, 2005). The District's distribution system also has eight PRV stations connecting zones to storage facilities.

SVWD operates four water treatment plants (WTPs) that treat groundwater prior to distribution. These facilities and their operations are listed in Table 3-4. SVWD has seven storage tanks for treated groundwater that have a total capacity of 3.3 MG. Due to low population growth rates and increasing conservation efforts that decrease demand, there is no indication that WTP, transmission and storage capacities will be reached in the near future.

Table 3-4: SVWD WTPs, Treatments, Capacities and Production

WTP	SVWD Wells	Aquifer Formation	Chemicals of Concern	Treatment Type	2015 Production (AFY)
Orchard Run	#3B	Butano and Lompico	Iron, manganese, hydrogen sulfide	Air stripper, dual media filtration, chlorination, and sequestering agent	160
	#7A				236
SVWD Well #9	#9	Santa Margarita and Monterey	Sulfate, MTBE, VOCs, hydrogen sulfide	Chlorination and granular activated carbon (GAC) filtration	0
SVWD Well #10	#10	Lompico	Iron, manganese, VOCs, hydrogen sulfide	Air stripper, dual media filtration, chlorination, sequestering agent, and standby GAC filtration	0
	#10A				374
El Pueblo	#11A	Lompico	Iron, manganese, arsenic, VOCs	pH adjustment, dual media filtration, chlorination, and sequestering agent	39
	#11B				324

In addition to potable water facilities, the District operates a 600,000-gallon recycled water storage tank and three miles of recycled water distribution mains to supply water to its irrigation customers (Figure 2-6). The source of recycled water is disinfected tertiary treated recycled produced at the Scotts Valley WRF, which is operated by the City of Scotts Valley in conjunction with the District. A description of the recycled water facilities is provided in Section 2.1.3 and a description of wastewater facilities is provided in Section 5.2.

3.4 Costs Associated With Supplies

3.4.1 Potable Water Supplies

In 2015, potable water sales to customers within SVWD's service area totaled approximately 369 MG (1,133 AF), which is equivalent to an average of 1.0 MGD. SVWD total operating expenses in 2015 for the raw water, treatment, distribution, management and general administration, and debt service for the potable water systems totaled approximately $3.93 million[2]. This equates to an average cost of operation of approximately $3,467 per AF of water.

[2] Estimated operating costs for the potable water system plus a prorated portion of SVWD administrative expenses, estimated to be 90% of total operating costs

3.4.2 Recycled Water Supplies

In 2015, recycled water sales to customers totaled approximately 59 MG (184 AF), which is equivalent to an average of 0.16 MGD. SVWD total operating budget in 2015 for the recycled water system totaled approximately $0.254 million[3]. This equates to an average cost of operation of $1,400 per AF of water.

3.4.3 Capital Improvement Costs

The approved fiscal year 2016 budget and the projected budgets are shown in Table 3-5.

Table 3-5: Capital Improvement Plan (CIP) Projects

Project Type	2016	2017	2018	2019	2020
CIP Projects -- Potable	$0.545M	$3.102M	$0.6M	$0.82M	$0.65M
CIP Projects -- Recycled	$0.15M	$0.510M	$1.51M	$6.51M	$6.51M
Other Projects	$0.985M	$1.467	$0.31	$0.25	$0.135
Annual Total	**$1.68M**	**$5.079M**	**$2.42M**	**$7.58M**	**$7.295M**
Grant Funding	($0.315M)	($0.75M)	($0.25M)	($2.75M)	($5.25M)
Net Total	**$1.37M**	**$4.33M**	**$2.17M**	**$4.83M**	**$2.05M**

Source: 2017-2021 CIP Plan, Provided by SVWD staff

The District's basic pricing policy for water and recycled water is a tiered rate system, as illustrated in Table 3-6.

Table 3-6: SVWD Rate Structure*

Potable Water Rates		**Recycled Water Rates**	
Volume (gallons)	**Rate (per 1,000 gal)**	**Volume (gallons)**	**Rate (per 1,000 gal)**
0 - 6,000*	$4.89		
6,001 - 12,000**	$8.59		
12,001 - 16,000**	$13.72		
Over 16,000**	$16.56	Landscape Recycled	$11.77
Landscape Potable	$14.31		
Commercial, Industrial, Institutional	$11.45		

* SVWD Rates also include a basic service charge in addition to volumetric charges
**Residential Units with Individual Meters

[3] Estimated operating costs for the recycled water system plus a prorated portion of SVWD administrative expenses, estimated to be 10% of total operating costs.

3.5 Groundwater Management

SVWD prepares an Annual Water Management Plan Report, such as the 2015 Annual Report for Scotts Valley Water District Groundwater Management Program (Kennedy/Jenks, 2016). The annual report is a management summary of groundwater conditions, and provides a description of the general status of the groundwater basin. The report focuses on evaluation of water supply and water quality and provides an assessment of the current groundwater management strategies. In addition, SVWD participates with other local water districts including SLVWD and MHA in the Santa Margarita Groundwater Basin Advisory Committee (SMGBAC). The SMGBAC encourages basin-wide management strategies and sponsors studies to better understand the basin.

The reliability of the District's groundwater supply has been evaluated based on estimates of safe yield volumes and recharge relative to precipitation. Short-term goals to increase reliability include continued reduction of groundwater usage through conservation and recycling programs. Longer-term options include LID stormwater recharge, expansion of the recycling program, in-lieu recharge, and groundwater replenishment with purified recycled water. Further discussion of each option can be found in the 2015 Annual Report (Kennedy/Jenks, 2016a) and the 2015 UWMP (Kennedy/Jenks, 2016b).

3.6 Water Use Trends

As the Scotts Valley area expanded, groundwater production rose from approximately 500 AF in 1977 to approximately 2,070 AF in 2003. Starting in 2004, groundwater production declined even though the number of service connections continued to grow. Groundwater production in 2015 was 1,133 AF, as a result of District led conservation efforts and the recent drought.

Groundwater production is below the historical maximum and has been on a downward trend even as customer connections has been gradually increasing. Since 2003 the historic high production of 2,070 AF, the District's groundwater production has declined by 9,372 AFY (approximately 45%) to the historic low production of 2015 of 1,133 AF. However, with the easing of recent drought conditions, the groundwater production is expected to increase to more typical values in the next several years.

Average groundwater production over the past three years has been approximately 1,303 AFY. The District has actively worked to control the growth of groundwater production primarily through the Water Conservation and the Water Recycling Programs.

Recycled water production began in 2002 and reached a peak usage of approximately 200 AF in 2013. Demand decreased in 2015 to 184 AFY, likely due to conservation through modified irrigation schedules and replacement of landscaping with drought-tolerant plants.

SVWD does not foresee a large increase in recycled water use in future years because of relative market saturation in the area served by the recycled water distribution system, where the most cost-effective non-potable reuse sites are already receiving recycled water. The majority of housing development in Scotts Valley is high density with very little irrigable land, thus there are few opportunities to offset non-potable demands in the future with recycled water. SVWD estimates that it may be able to increase the total demand within the water service area by less than 10-percent into the future.

There is planned export of secondary effluent out of the SMGB area to serve the Pasatiempo Golf Course. This could have an overall regional benefit to reduce potable demands for the City of Santa Cruz. However, this demand would typically be a summer time demand, still leaving excess secondary effluent available for groundwater replenishment. This service to Pasatiempo Golf Course was estimated to occur in 2017. Pasatiempo, the City of Scotts Valley and the District recently signed agreements in 2016 related to use, maintenance and operation to support the extraction of secondary effluent from the ocean outfall pipeline for additional treatment and use at the Pasatiempo Golf Course. The agreements allow Pasatiempo to divert up to 170,000 gallons per day (about 118 gallons per minute) for a maximum of 35 million gallons per year (107 acre-feet per year) of secondary effluent.

Although water demand is expected to increase in future years due to population growth, the District believes that potable and recycled water demands will only increase by a few hundred acre-feet over the next 20 years.

3.7 Quality of Water Supplies

The potable water provided by SVWD consistently meets the USEPA and the California DDW primary and secondary potable water standards. The major naturally-occurring constituents of concern for groundwater supplies for the water agencies using groundwater from the SMGB are naturally occurring iron, manganese, TDS, sulfate, nitrate, and arsenic. A discussion of each constituent and the associate treatment processes used to meet potable water requirements is included in the 2015 Annual Report (Kennedy/Jenks, 2016a). SVWD WTPs treat groundwater for these constituents to meet the regulatory limits and aesthetic standards. Concentrations of constituents of concern are listed in Table 3-7 as reported in the SVWD Report on Water Quality for 2015 (SVWD, 2015).

Table 3-7: SVWD Groundwater Quality for 2015

Constituent	Concentration (average)
Iron	80 PPB
Manganese	14.8 PPB
Sulfate	97 PPM
TDS	458 PPM

Source: Report on Water Quality for 2015; PPB = parts per billion; PPM= parts per million

The Santa Margarita groundwater basin has historic plumes of contaminated compounds, such as petroleum hydrocarbons, gasoline additives, and solvents, which could pose a risk to some of the water agencies potable water wells. These plumes are being actively remediated and regulated by the California Regional Water Quality Control Board (RWQCB). The SVWD and other agencies regularly communicate with the RWQCB to understand the current status of the contamination and remediation.

3.8 Sources of Additional Water

Water supplies for the SVWD, SLVWD, MHA and other water agencies in the SMGB are solely derived from rainfall in the local watersheds which recharges local groundwater and flows to surface water streams. Additional water supplies available to the water agencies in the SMGB are limited.

The SVWD and other agencies are developing LID stormwater recharge projects to help increase the amount of rainfall and stormwater that is recharged into the SMGB. However, the recharge amounts are small (less than an AFY) and the recharge is mostly in the upper aquifer.

Advanced purified recycled water could be a local, reliable, drought-proof source of water supply for active groundwater replenishment of the lower Lompico aquifer. Instead of discharging the excess secondary effluent out of the SMGB watershed and into the Pacific Ocean, the water can be purified and injected back into the aquifer. It is estimated that from 460 to 567 AFY of new water supply is available for replenishment of the SMGB to benefit the groundwater pumpers.

Replenishment of the SMGB benefits other agencies that pump from the SMGB but can also have potential regional benefit by storing groundwater for future droughts. The stored groundwater could be used as a drought supply by SVWD as well as SLVWD and MHA, with the potential to sell excess supplies to the City of Santa Cruz.

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Section 4. Regulatory and Treatment Requirements for Recycled Water

The production, discharge, distribution, and use of recycled water are subject to regulatory requirements intended to protect public health. This section describes the applicable regulations and treatment requirements for discharge of wastewater and the production and distribution of recycled water.

Water quality requirements vary depending on whether the wastewater is being treated for discharge to the environment or for reuse (recycled water). In the case of water reuse, treatment requirements vary depending on the type of end use. The treatment technologies to meet different water quality requirements are described in later sections.

4.1 Wastewater Discharge Requirements

The Central Coast Regional Water Quality Control Board (CCRWQCB, or Regional Board) regulates discharges of waste to land and groundwater through Waste Discharge Requirements (WDRs) and National Pollutant Discharge Elimination System (NPDES) permit requirements.

Wastewater from the City of Scotts Valley is treated to secondary effluent and further treated to recycled water by the Scotts Valley WRF. SVWD has the right to use and distribute the recycled water produced at the Scotts Valley WRF. The City of Scotts Valley prepared and filed a Report of Waste Discharge on February 18, 1999 to obtain authorization to provide up to 1.0 MGD of disinfected tertiary recycled water for distribution by SVWD. That report constitutes consent by the City of Scotts Valley for the adoption of the Master Water Recycling Requirements, which became active when SVWD first supplied recycled water in 2000. The wastewater effluent and recycled water quality is subject to three different standards based on the relevant current permits:

- Wastewater treated to a secondary level and discharged as wastewater is subject to **NDPES permit Order No. R3-2013-0001** (NPDES No. CA0048828), which provides effluent limitations for the constituents shown in Table 4-1.
- Water that is treated to a tertiary level and used as non-potable recycled water is subject to **Master Water Recycling Requirements (Producer) Order No. 01-066**, which specifies recycled water treatment requirements.
- Recycled water that is provided for irrigation is subject to the **Master Water Recycling Requirements (Distributor) Order No. 01-067**, which specifies recycled water distribution requirements.

For a future groundwater replenishment project, SVWD would need to obtain a new permit from the Regional Board. The existing master water recycling permits for the producer (City of Scotts

Valley) and distributor (SVWD) facilitate the non-potable utilization of recycled water while providing adequate protection of public health. Section 4.2, Recycled Water Use Ordinances and Permits, includes further discussion of treatment requirements for the current water non-potable recycled permits. Section 4.4 provides discussion of requirements for potable reuse.

Specific discharge requirements are defined by the surface water quality and groundwater quality objectives in the Basin Plan (CCRWQCB, 2011) adopted in 1990 and amended most recently in 2011. Additionally, if the existing surface or groundwater background water quality is better than the prescribed objective, the CCRWQCB will enforce an Anti-Degradation Policy for all constituents to prevent further degradation due to the use of recycled water.

Table 4-1: Effluent Limitations for Scotts Valley WRF (NPDES WDR Order No. R3-2013-0001)

Constituent	Units	Monthly Average	Weekly Average	Max Daily	Instant-aneous Max	Average Monthly Minimum Removal
BOD_5	mg/l	30	45	90	--	85%
	lbs/day	375	565	1,125	--	
$CBOD_5$	mg/l	25	40	85	--	85%
	lbs/day	310	500	1,060	--	
Total Suspended Solids (TSS)	mg/l	30	45	90	--	85%
	lbs/day	375	565	1,125	--	
Oil & Grease	mg/l	25	40	75	--	--
	lbs/day	310	500	940	--	
Settleable Solids	mL/L/hr	1.0	1.5	--	3.0	--
Turbidity	NTU	75	100	--	225	--
pH	pH units	6.0 to 9.0 at all times				
Total Coliform Bacteria	MPN/ 100mL	--	--	--	100,000	--
Fecal Coliform Bacteria	MPN/ 100mL	--	--	--	20,000	--
Enterococcus Bacteria	MPN/ 100mL	--	--	--	2,400	--
TCDD Equivalents	ug/L	$4.5e10^{-7}$	--	--	--	--
	lbs/day	$5.6e10^{-8}$	--	--	--	--
Acute Toxicity	TUa	--	--	3.7	--	--
Chronic Toxicity	TUc	--	--	115	--	--
Total Chlorine Residual	ug/L	0.23		0.92	6.9	--
	lbs/day	2.9		12	86	--

Notes: BOD = biological oxygen demand; CBOD = carbonaceous BOD; MPN = most probably number; NTU = nephelometric turbidity units; TCDD = total chlorinated dibenzodioxins

Effluent limitations for secondary treated wastewater discharged to Discharge Point 001 (Pacific Ocean, Monterey Bay National Marine Sanctuary)

4.1.1 Water Quality Objectives (WQOs) and Effluent Limits

Water quality objectives for Monterey Bay (for secondary effluent discharge) and groundwater (for non-potable reuse of tertiary effluent) are described in the Basin Plan (CCRWQCB, 2011). The following CCRWQCB policies apply for the protection of surface or groundwater.

4.1.1.1 Basin Plan for the Central Coast Basin

Wastewater is discharged into the Monterey Bay, which is part of the Pacific Ocean. The Basin Plan has the following anti-degradation policy for ocean waters:

- Dissolved oxygen concentrations must be at least 5.0 mg/l at all times, and the mean annual concentration must be at least 7.0 mg/l
- Maintain a pH value between 7.0 and 8.5
- Radionuclides must not be present at a level that will negatively impact the environment

The water quality objectives from the Basin Pan drive the water quality requirements specified in the NPDES permit for Scotts Valley WRF. The NPDES permit identifies the Monterey Bay as a National Marine Sanctuary, which prioritizes preserving the Bay's resources but does not provide specific effluent limitations. At the time of this report, there are no anticipated changes in the secondary discharge requirements.

4.1.1.2 Groundwater Objectives

Recycled water that is currently used for irrigation (non-potable use) in Scotts Valley is applied on the SMGB. No ground or surface water monitoring is required as part of the District's current permit for non-potable recycled water use. The water quality objectives of the tertiary treated recycled water is listed in the Master Water Recycling Requirements (Producer) Order No. 01-066, which is included in Appendix B and described in Section 4.2. Separately, SVWD, SLVWD and the other water agencies monitor water quality for groundwater production wells used for potable water supply for constituents specified in the Safe Drinking Water Act and under Title 22 of the CCR.

In the case of a future SMGB groundwater replenishment project using advanced purified water, water quality monitoring requirements for groundwater will be determined as part of the project permitting efforts.

The Basin Plan provides general objectives that apply to all groundwaters of the basin including:

- **Tastes and Odors:** Ground waters shall not contain taste or odor producing substances in concentrations that adversely affect beneficial uses.
- **Radioactivity:** Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life; or result in the accumulation of radionuclides in the food web to an extent which presents a hazard to human, plant, animal, or aquatic life.

In addition, specific objectives for municipal and domestic supply wells include reference to:

- **Bacteria:** The median concentration of coliform organisms over any seven-day period shall be less than 2.2/100 ml.
- **Organic Chemicals**: Ground waters shall not contain concentrations of organic chemicals in excess of the limiting concentrations set forth in California Code of Regulations, Title 22, Chapter 15, Article 5.5, Section 64444.5, Table 5.
- **Chemical Constituents:** Ground waters shall not contain concentrations of chemical constituents in excess of the limits specified in California Code of Regulations, Title 22, Chapter 15, Article 4, Section 64435, Tables 2 and 3.
- **Radioactivity:** Ground waters shall not contain concentrations of radionuclides in excess of the limits specified in California Code of Regulations, Title 22, Chapter 15, Article 5, Section 64443, Table 4.

Results of groundwater quality analysis by SVWD, SLVWD and other water agencies are reported to the DDW. The water agencies annually prepare and distribute water quality reports to keep customers informed on water quality issues. There are no anticipated changes in the non-potable recycled water requirements or groundwater quality objectives at this time.

4.2 Recycled Water Use Ordinances and Permits

Current recycled water use by SVWD includes only non-potable use. This section describes existing recycled water programs, the SVWD permit (for Distributor), and the City of Scotts Valley permit (for Producer).

4.2.1 Existing Program Policies and Specifications

The District prepared the *Scotts Valley Water District Water Recycling Program Engineering Report* (EOA, 2000) to satisfy the Title 22 Water Reclamation Criteria and provide additional information needed by the CCRWQCB and the DDW in reviewing the Master Water Reuse Permit Application to initiate the Scotts Valley Water Recycling Project.

Additionally, the District prepared the *Scotts Valley Water District Water Recycling Program Rules and Regulations for Recycled Water Customers* to provide customers with guidance for the design and construction of recycled water reuse facilities and the use of recycled water in accordance with the uniform statewide recycling criteria.

The District has produced a series of guidance documents to support users of recycled water. These include but are not limited to:

- Customer On-Site Design Manual for Water Recycling Program (January 2002): http://my.spinsite.com/SVW/uploads/RecycledDesignManual.pdf

- Customer General Information for Water Recycling Program (January 2002)
- Recycled Water Off-Site Standard Details (August 2002): http://my.spinsite.com/SVW/uploads/SVWDRecycledStdDetailList.pdf
- Recycled Water On-Site Design and Construction Guidelines for Residential Dual Plumbed Homes (June 2004) for irrigation reuse
- On-Site Recycled Water Notes for Residential Sites:
- Standard Notes for On-Site Recycled Water Irrigation Systems: http://my.spinsite.com/SVW/uploads/SVWDRecycledStds.pdf
- Various recycled water forms for application, service plan, user permit, site specific requirements, instructions, cross-connection tests, activity logs, self-monitoring report, etc.
    - RW application: http://my.spinsite.com/SVW/uploads/SVWDRecycledApp.pdf
    - CA health laws: http://my.spinsite.com/SVW/uploads/CalDPHPurplebook.pdf
    - SVWD rules & regulations: http://my.spinsite.com/SVW/uploads/RecycledRulesRegs.pdf

4.2.2 SVWD Existing Recycled Water Permit for Non-Potable Use

The District's Master Water Recycling Requirements (Distributor) Order No. 01-067 identifies SVWD as the owner and operator of a recycled water storage and distribution system located in the City of Scotts Valley. The primary objectives of the order are to:

1. Regulate the reuse of tertiary treated domestic wastewater,
2. Develop discharge limits, and
3. Develop a monitoring program to evaluate potential impacts to water quality.

The City of Scotts Valley WRF is the producer of the tertiary treated recycled water, which meets the Title 22 water recycling criteria. The District's permit facilitates the non-potable utilization of recycled water to the fullest extent possible, while providing adequate protection of public health and reducing the regulatory burden of present and future recycled water users.

The approved recycled water applications are all non-potable and include irrigation of landscapes, food crops, and pastures, and supply for recreational and landscape impoundments as well as for fire fighting. The permit allows for the treatment and reuse of up to 1.0 MGD. Future specific reuse projects can be added on a case-by-case basis in accordance with the approved permit-based program of Rules and Regulations for Recycled Water Customers (Article 8 of Scotts Valley Water District's Ordinance 119-96). A future SMGB groundwater replenishment project for potable reuse would require an additional, separate permit and supporting technical documentation.

The Monitoring and Reporting Program (MRP) requires effluent monitoring and treatment system performance monitoring. No additional ground or surface water monitoring is required. The existing and anticipated beneficial uses for groundwater and surface water stipulated in the Basin Plan and the associated water quality objectives are outlined in the permit. The MRP Order No. 01-067, attached to the permit, details recycled water monitoring requirements, standard observations, distribution system inspections, and reporting requirements.

The prohibitions, master water recycling specifications and provisions for the District's use of recycled water are detailed in the permit. The prohibitions focus on the distribution and use requirements for recycled water including cross-connection testing and recycled water application practices by the user. The specifications describe training and signage requirements, user and distributor reporting requirements, required inspections, and mitigation measures, plus actions needed to revise the order. The provisions refer to the uniform statewide water recycling criteria, MRP and standard provision reporting requirements, and notification requirements.

4.2.3 City of Scotts Valley Existing WRF Permit

The Scotts Valley WRF's Master Water Recycling Requirements (Producer) Order No. 01-066 identifies the City of Scotts Valley as the owner and operator of a wastewater collection, treatment, disposal and water recycling facility located in the City of Scotts Valley. The primary objectives of the order are to:

1. Permit the reuse of tertiary treated domestic wastewater,
2. Develop discharge limits, and
3. Develop a monitoring program to evaluate potential impact to water quality.

The Scotts Valley WRF serves the commercial, industrial and domestic sanitary wastewater needs of the City of Scotts Valley and its vicinity. The secondary wastewater treatment facility is regulated by the CCRWQCB under Order No. 97-12 and is independent of the Master Water Recycling Requirements.

In September 1999, the Scotts Valley WRF was upgraded to produce 1.0 MGD of tertiary recycled water from secondary treated effluent using coagulation, flocculation, filtration, denitrification and disinfection with UV. Recycled water is stored on-site in a wet well and off-site in a 600,000 gallon tank and delivered to District customers through the District's recycled water distribution system. Distribution of recycled water is regulated under SVWD's Order No. 01-067 described in the previous section.

Future modifications of the treatment processes or expansion of treatment plant capacity would require a revised Engineering Report submitted to DDW for review and approval. The CCRWQCB will review Order 01-066 periodically and may revise the requirements as necessary.

The MRP requires influent monitoring, effluent monitoring, and treatment system performance monitoring for the Scotts Valley WRF. Similar to Order No. 01-067, no additional ground or surface water monitoring is required. The Basin Plan objectives described in Order No. 01-067 are also included in the City of Scotts Valley permit. The MRP Order No. 01-066, attached to the permit, details monitoring requirements, standard observations, treatment system inspections, and reporting requirements.

The prohibitions, recycled water limitations and provisions for the discharge of waste from the Scotts Valley WRF are detailed in the permit. The prohibitions focus on the production, storage and delivery of recycled water from the Scotts Valley WRF. The limitations describe treatment specifications and effluent limits. The provisions describe maintenance, training, and inspection requirements plus actions needed to revise the order.

4.2.4 General Permit for Non-Potable Recycled Water Use

In June 7, 2016, the SWRCB adopted *General Waste Discharge Requirements for Recycled Water Use* which covers non-potable uses of recycled water which will become effective August 6, 2016. The 2016 permit will replace the existing statewide Waste Discharge Requirements for Recycled Water Use (2014-0090-DWQ). Existing 2014-0090-DWQ enrollees will receive communication from the Regional Water Boards or State Water Board regarding the transition process by the end of June 2016. . The intent of the order is to streamline the permitting process and delegate the responsibility of administrating water recycling programs to an Administrator to the fullest extent possible. The document serves as a statewide General Order authorizing the use of recycled water for all Title 22 uses. Groundwater replenishment activities (potable reuse) and disposal of treated wastewater are specifically excluded. Recycled water producers that are already covered under existing orders (as in the case of SVWD) may elect to either (i) continue or expand coverage under existing orders, or (ii) apply for coverage under this General Order.

The General Order includes certain requirements and prohibitions and specifies that recycled water production, distribution, and use comply with applicable Title 22 and Title 17 requirements. Compliance with the General Order does not relieve producers or distributors from the obligation to comply with applicable WDRs for discharges from wastewater treatment plants.

4.3 Water Quality Requirements for Non-Potable Reuse

In the State of California, recycled water requirements are administered by the SWRCBDDW[4] and individual RWQCBs. State requirements are contained in the California Water Code California Code of Regulations (CCR), which includes Title 22 and Title 17, and the Health and Safety Code. These regulations, compiled in the “Regulations Related to Recycled Water” updated July 16, 2015 which

[4] The Potable water Program for CDPH moved to the SWRCB and was renamed the Division of Potable water (DDW) as of July 1, 2014.

is available at the SWRCB website http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/lawbook/RWregulations_20150716.pdf, are intended to protect public health.

In some cases there may be additional customer requirements for recycled water quality for non-potable project end uses, beyond the minimum standard set by the above health-protective requirements. For example, though removal of TDS, a measure of salinity, is not required by DDW, it may be desirable depending on the end use and the concentration of TDS in the source water.

This section of the report first summarizes State requirements for irrigation using recycled water (non-potable use) under Title 22 (Section 4.3.1) and requirements for preventing cross-connections of recycled water with potable supplies.

4.3.1 Title 22 Requirements for Disinfected Tertiary Recycled Water

The DDW regulates the treatment, quality, and use of recycled water, as well as the proper separation of recycled water and potable water systems. Title 22 of the CCR stipulates the levels of treatment for different non-potable uses of recycled water, permissible types of reuse, and minimum recycled water quality requirements. Water meeting these standards is considered safe for non-drinking purposes. Routine monitoring is required to ensure that the intended quality is consistently being produced.

Figure 4-1 summarizes the Title 22 requirements for non-potable use of recycled water. Most non-potable recycled water used in California meets the Title 22 standards for "disinfected tertiary recycled water," which has the most stringent requirements compared to other Title 22 levels of treatment for non-potable use and is suitable for many types of uses. A lower degree of treatment, "disinfected secondary recycled water", is allowed for specified irrigation, non-irrigation and environmental uses, and is less frequently used.

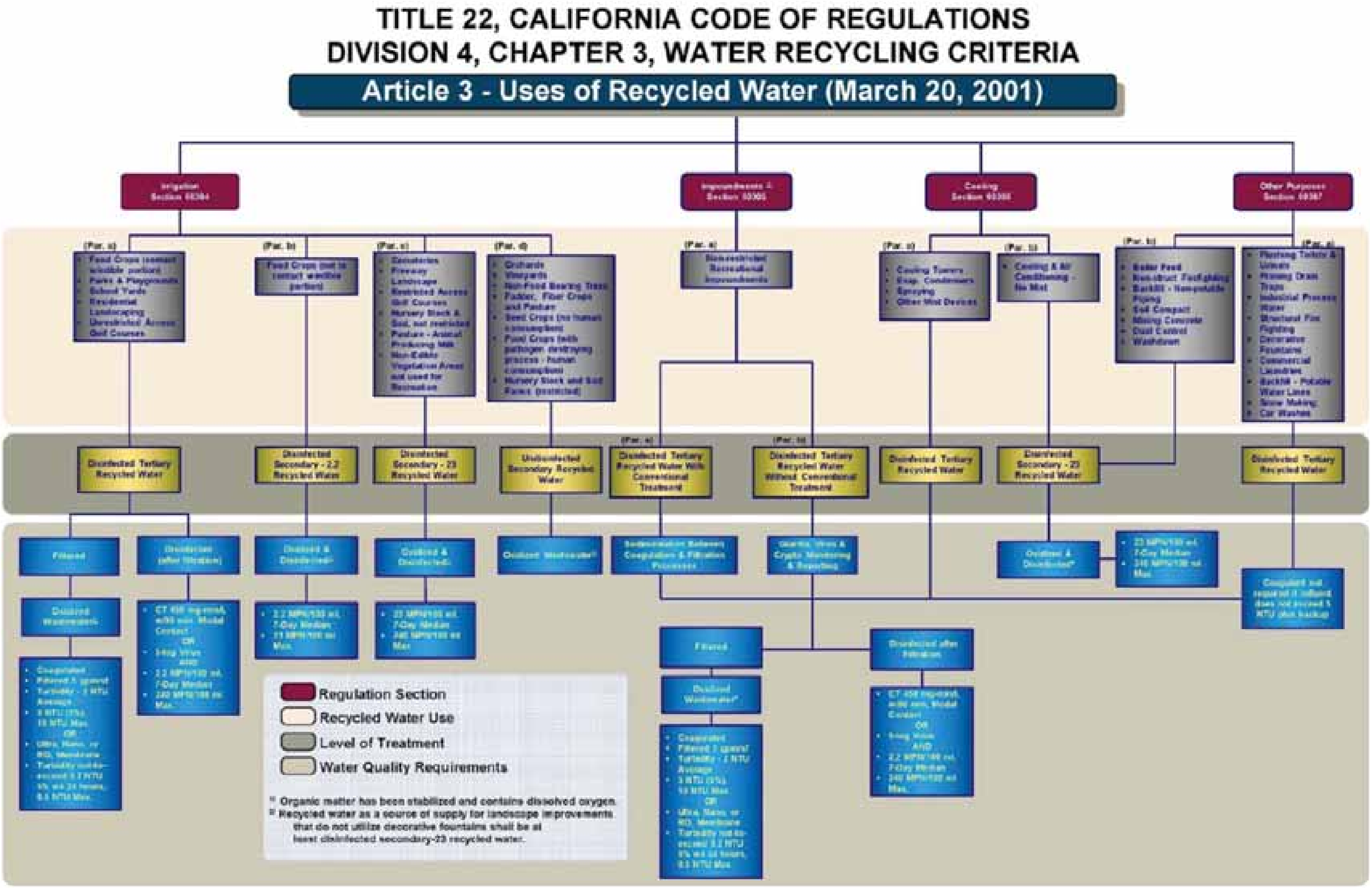

Figure 4-1: Summary of California Regulations for Non-Potable Water Reuse

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Water recycling by the SVWD is regulated under the RWQCB Order No. 01-066 and 01-067and specifies disinfected tertiary recycled water in conformance with Title 22. The treated effluent from the Scotts Valley WRF meets DDW Title 22 recycled water standards for unrestricted use (i.e., disinfected tertiary recycled water).

"Disinfected tertiary recycled water" means a filtered and subsequently disinfected wastewater that meets certain total coliform concentration, turbidity, and disinfection requirements, including the following per Title 22:

1. The filtered wastewater has been disinfected by either:
    a. A chlorine disinfection process following filtration that provides a CT (the product of total chlorine residual and modal contact time measured at the same point) value of not less than 450 milligram-minutes per liter at all times with a modal contact time of at least 90 minutes, based on peak dry weather design flow; or
    b. A disinfection process that, when combined with the filtration process, has been demonstrated to inactivate and/or remove 99.999% of the plaque-forming units of specific bacteriophage MS2, or polio virus in the wastewater. A virus that is at least as resistant to disinfection as polio virus may be used for purposes of the demonstration.
2. The median concentration of total coliform bacteria measured in the disinfected effluent does not exceed an MPN of 2.2 per 100 milliliters (ml) utilizing the bacteriological results of the last seven days for which analyses have been completed and the number of total coliform bacteria does not exceed an MPN of 23 per 100 ml in more than one sample in any 30 day period. No sample shall exceed an MPN of 240 total coliform bacteria per 100 ml.

Title 22 covers a number of non-potable uses including irrigation, recreational impoundments, industrial/commercial cooling, flushing toilets, commercial car washes, etc. Recycled water can also be used for environmental purposes such as wetlands creation and enhancement, and stream flow augmentation. These environmental uses are reviewed by regulatory agencies on a case-by-case basis, but these uses are not specifically covered under the Title 22 Water Recycling Criteria.

In addition to recycled water uses and treatment requirements, Title 22 addresses water quality monitoring, use area requirements, preparation of an engineering report prior to production or use of recycled water, general treatment design requirements, reliability requirements, and alternative methods of treatment. Recycled water quality monitoring for disinfected tertiary recycled water includes daily sampling for total coliform and continuous sampling for turbidity using a continuous turbidity meter and recorder following filtration. Use area requirements dictate recycled water application distance requirements from water supply wells (i.e., buffer zone), irrigation run-off control and overspray guidelines, and signage requirements. Treatment facility reliability features include guidelines for establishing operational and reliability measures and operator certification requirements.

4.3.2 Title 17 Requirements for Recycled Water

In addition to Title 22 requirements for non-potable water reuse, DDW reviews and approves final plans for cross connection control and pipeline separations in accordance with Title 17, and inspects distribution systems prior to operation. The focus of Title 17 is protection of potable water supplies through control of cross connections with non-potable water supplies such as recycled water. Title 17 specifies the minimum backflow protection required on the potable water system for situations in which there is potential for contamination to the potable water supply.

Under Title 17, recycled water is addressed as follows:

- An air-gap separation is required on "Premises where the public water system is used to supplement the recycled water supply."
- A reduced pressure principle backflow prevention device is required on "Premises where recycled water is used and there is no interconnection with the potable water system."
- A double-check valve assembly may be used for "Residences using recycled water for landscape irrigation as part of an approved dual plumbed use area established pursuant to sections 60313 through 60316 unless the recycled water supplier obtains approval for the local public water supplier, or [DDW] if the water supplier is also the supplier of the recycled water, to utilize an alternative backflow prevention plan that includes an annual inspection and annual shutdown test of the recycled water and potable water systems pursuant to subsection 60316(a)."
- All recycled water pipes installed above or below the ground are required to be colored purple or distinctively wrapped with purple tape.

4.4 Water Quality Requirements for Potable Reuse

Potable reuse may be classified into two types: indirect potable reuse (IPR) through groundwater replenishment (GWR) and direct potable reuse (DPR). IPR is the purposeful introduction of purified recycled water into an untreated potable water supply source (i.e., a groundwater aquifer or surface water body) that serves as a natural buffer. In DPR, the purified water is introduced immediately upstream of a potable water treatment plant or directly into the potable water supply distribution system, i.e., no natural buffer.

The level of treatment for IPR may vary depending on the size of the environmental buffer and type of application. Groundwater replenishment via surface spreading requires at least tertiary treatment and takes advantage of the soil aquifer treatment that occurs in the vadose zone. Groundwater replenishment via direct injection (i.e. a subsurface application) requires advanced water purification. Reservoir augmentation would require advanced water purification and would typically benefit from additional treatment at a potable water reservoir before introduction into the potable system.

Preliminary DPR regulations are not currently available, however it is anticipated that the required water quality requirements and treatment technologies may be similar to the GWR regulations. In addition to advanced water purification an “engineered buffer” (storage tank) would likely need to be provided, in-lieu of the environmental buffer offered by GWR, to ensure that water quality leaving the facility always met regulatory standards.

As discussed in this report, SVWD is exploring opportunities to directly inject advanced purified recycled water during low non-potable recycled water usage periods to replenish the over-drafted SMGB. A groundwater replenishment project at or near the Hanson Quarry property in Scotts Valley would be considered a GWR project and would be subject to California regulations for groundwater replenishment via subsurface application.

4.4.1 Groundwater Replenishment Reuse Regulations

Regulations for IPR using GWR became effective on June 18, 2014 and were added to the Title 22 Code of Regulations (Division 4, Chapter 3, Articles 5.1 and 5.2). These regulations define a “Groundwater Replenishment Reuse Project” (or GRRP) as a “project involving the planned use of recycled municipal wastewater that is operated for the purpose of replenishing a groundwater basin designated in the Water Quality Control Plan…for use as a source of municipal and domestic water supply” (DDW 2014).

Full advanced treatment (FAT) is required in the case of groundwater replenishment via injection (subsurface application), and may not be required in the case of groundwater replenishment via surface spreading. FAT is defined as the treatment of an oxidized wastewater (wastewater in which the organic matter has been stabilized) using a reverse osmosis (RO) and oxidation treatment process meeting certain minimum criteria (DDW 2014). For oxidation, common advanced oxidation process (AOP) technologies are ultraviolet (UV) treatment with addition of chlorine, hydrogen peroxide, or ozone.

A key aspect of the GRRP regulations is that the recharge water (recycled water) must receive treatment that achieves at least 12-log enteric virus reduction, 10-log *Giardia* cyst reduction, and 10-log *Cryptosporidium* oocyst reduction, referred to as the 12-10-10 log removal. A 10-log removal corresponds to 99.99999999% removal and 12-log removal corresponds to 99.9999999999% removal.

Credits towards these pathogen log removal goals can be obtained through the entire treatment process, including the wastewater treatment plant (i.e., secondary treatment), the advanced treatment processes (FAT), and the environmental buffer (i.e., the groundwater aquifer). Table 4-2 is a generalized summary of estimated pathogen log-removal credits for various unit treatment processes, which may be summed in a treatment train to estimate the total log removal. The total log removal is then compared to the total required removal per the GRRP regulations. Table 4-3 presents example target/expected log removal credits for potable reuse projects considering aquifer recharge or reservoir augmentation

For groundwater replenishment using surface spreading, the 10-log removal requirements for *Giardia* and *Cryptosporidium* can be waived for disinfected tertiary effluents (per Title 22) that achieve at least six months of storage underground (CDPH 2014; Gerrity et al. 2013), as indicated in Table 4-2. For spreading, recycled water applied at a GRRP must receive treatment that meets the definition of a filtered wastewater or disinfected tertiary recycled water. For injection, the recycled water must receive FAT. The water quality requirements prior to recharge are the same for spreading or injection (per Table 4-2), except for TOC, which depends on the RWC in the case of spreading (see Figure 4-2).

Table 4-2: Summary of Water Quality and Treatment-Related DDW Regulations for IPR via Groundwater Replenishment

Treatment Requirements	Water Quality Requirements
Spreading (i.e., surface application) Oxidation Filtration Disinfection Soil aquifer treatment Injection with FAT (i.e., subsurface application) Oxidation Reverse Osmosis AOP	≥ 12-log virus reduction* ≥ 10-log *Giardia* cyst reduction** ≥ 10-log *Cryptosporidium* oocyst reduction** Drinking water MCLs (except for nitrogen) ≤ 10 mg/L total nitrogen Action levels for lead and copper TOC ≤ 0.5 mg/L for injection TOC ≤ 0.5/RWC for spreading *(Water quality requirements are applicable prior to recharge except where noted * and **)*
Underground Retention Time	
Minimum 2-month retention time underground	
Pathogen Log Reduction Credits for Underground Retention	
*For spreading, or injection with FAT, 1-log virus reduction credit automatically given per month of subsurface retention (less credit may be given depending on whether a tracer study or lesser method has been used to estimate retention time) **For spreading, 10-log *Giardia* reduction and 10-log *Cryptosporidium* reduction credit given to disinfected tertiary effluents with at least 6 months retention time underground	
Recycled Water Contribution (RWC) / Diluent Water Requirements	
For spreading, initial maximum RWC ≤ 20%. Over time the RWC can be increased if certain requirements are met. For injection with FAT, up to 100% RWC	
Other Selected Requirements	
Treatment train shall consist of at least 3 separate treatment processes to achieve the required pathogenic (microorganism) control For each pathogen (i.e., virus, *Giardia*, or *Cryptosporidium*), a separate treatment process may be credited with no more than 6-log reduction, with at least 3 processes each being credited with no less than 1.0-log reduction	

Notes: AOP = advanced oxidation process; FAT = full advanced treatment; MCL = maximum contaminant level; RWC = recycled water contribution (the quantity of recycled water applied at the recharge site divided by the sum of the quantity of recycled water applied at the site and diluent water); TOC = total organic carbon

Table 4-3: Predicted Log-Removal Credits for Various Treatment Processes

Process	Log Reduction Credit		
	Virus	*Giardia*	*Cryptosporidium*
Benchmark Treatment Processes			
Secondary treatment	2	2	2
Microfiltration or Ultrafiltration	0	4	4
Reverse Osmosis	1	1	1
Advanced Oxidation Process	6	6	6
Chlorine Disinfection[(a)]	4	2	0
Total Credits	13	13	13
Required Credits per GRRP Regulations	12	10	10
Additional Treatment Processes			
Ozone[(b)]	4	3	1
Conventional drinking water treatment	4	4	4

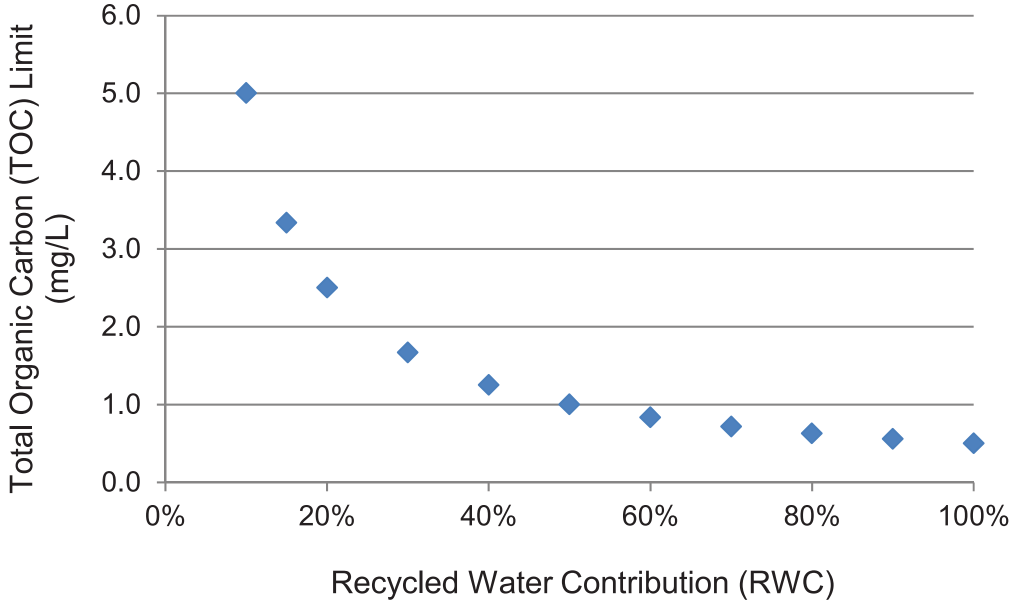
Notes:

(a) Disinfection with chlorine following advanced oxidation

(b) Ozone could be used before microfiltration or ultrafiltration, or following advanced oxidation

Source: Raucher and Tchobanoglous 2014.

Figure 4-2: Allowable TOC for Surface Spreading Based on Recycled Water Contribution



The following list summarizes the major reports, actions, and studies required by the GRRP regulations to implement a groundwater replenishment project. The language below is in a summary form; readers should refer to the regulations for precise requirements and conditions (CDPH 2014).

Prior to groundwater replenishment:

- Prepare engineering report with hydrogeological assessment.
- Prepare a map of the GRRP site with potable water well and monitoring well locations.
- Site and construct at least two monitoring wells downgradient of the GRRP.
- Conduct background water quality monitoring for the potentially affected aquifer (total nitrogen, regulated contaminants and physical characteristics, TOC, Priority Toxic Pollutants from 40 CFR Section 131.38, any additional contaminants specified by DDW).
- For surface spreading (i.e., no FAT), prior to initial operation and at five-year intervals thereafter, conduct study to determine occurrence of indicator compounds[5] (i.e., trace organic chemicals [TOrCs]) in the recycled water.

[5] The GRRP regulations define "Indicator Compound" as an individual chemical in a GRRP's municipal wastewater that represents the physical, chemical, and biodegradable characteristics of a specific family of trace organic chemicals (TOrCs); is present in concentrations that provide information relative to the environmental fate and

- For injection, to demonstrate that a sufficient advanced oxidation process has been designed as part of FAT, conduct study to select and determine occurrence of indicator and surrogate[6] compounds (i.e., TOrCs) in the recycled water and conduct challenge or spiking tests to determine removal of indicator compounds; alternatively, conduct testing to demonstrate that the oxidation process will provide no less than 0.5-log (69 percent) reduction of 1,4-dioxane.
- Demonstrate that all treatment processes have been installed and can be operated to achieve their intended function.
- Validate each of the treatment processes used to meet the 12-10-10 log requirements by submitting a report for DDW review or by using an approved challenge test.
- Prepare Operation Optimization Plan that includes operations, maintenance, analytical methods, and monitoring necessary to meet the GRRP requirements, including ongoing monitoring to verify performance of treatment processes used to meet the 12-10-10 log requirements, and submit to regulator for approval.
- Hold public hearing prior to initial permit and any time an increase in maximum RWC is proposed.
- Develop a method for determining the volume of diluent water to be credited.
- Obtain DDW approval of a plan to provide an alternative potable water supply or treatment for all users of a potable water well that has been compromised as a result of the GRRP's operations.
- Conduct a tracer study to determine underground retention time (must be initiated prior to the end of the third month of operation).

During groundwater replenishment (ongoing):

- Ensure that the recycled water is from a wastewater management agency that maintains a source control program.
- Ongoing monitoring to verify performance of treatment processes used to meet the 12-10-10 log requirements.

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transport of those chemicals; may be used to monitor the efficiency of TOrCs removal by treatment processes; and provides an indication of treatment process failure.

[6] The GRRP regulations define "Surrogate Parameter" as a measurable physical or chemical property that has been demonstrated to provide a direct correlation with the concentration of an indicator compound, can be used to monitor the efficiency of TOrCs removal by a treatment process, and/or provides an indication of a treatment process failure.

- Ongoing weekly, quarterly, or annual monitoring (depending on the water quality parameter) for water quality parameters including primary and secondary drinking water MCLs, Priority Toxic Pollutants, chemicals having California Notification Levels (NLs), indicator compounds, etc. according to the Operation Optimization Plan.
- For surface spreading (i.e., no FAT), prior to initial operation and at five-year intervals thereafter, conduct study to determine occurrence of indicator compounds in the recycled water. Evaluate the soil aquifer treatment (SAT) process through ongoing monitoring of removal of indicator compounds, with a target of 90% reduction. For injection, continuously monitor the selected indicator and/or surrogate compounds during full-scale operation of the oxidation process.
- Ensure diluent water, if used, does not exceed primary MCLs or secondary MCL upper limits and NLs and implement water quality monitoring plan.
- Ongoing determination of the RWC.
- Annual reporting to the DDW and RWQCB.
- Update Engineering Report every five years.

4.4.2 Potable Reuse Requirements for Reservoir Augmentation

While there are numerous IPR potable reuse projects in the United States involving groundwater replenishment, planned augmentation of surface water reservoirs with recycled water is less common. One example is the Occoquan Reservoir, a potable water supply for Fairfax County, Virginia, which has been augmented with recycled water upstream of the reservoir since 1978. In San Diego, California, augmentation of the San Vicente Reservoir is currently being studied (EPA 2015).

No regulatory framework for reservoir augmentation using recycled water exists within the State. However, California Senate Bill 918 (SB918) was adopted and signed into law in 2010, which directs DDW to develop and adopt water recycling criteria for surface water reservoir augmentation by December 31, 2016. The general regulatory framework under which reservoir augmentation would be permitted has been defined and draft regulation text has been developed (Hultquist 2014). As part of SB918, the regulatory development process must include input from an Expert Panel that advises DDW.

With respect to water quality requirements, the draft regulations build upon the minimum 12-10-10 log removal values for microorganisms that have been included in the groundwater recharge regulations. Treatment requirements for trace organic contaminants (TOrCs) will also likely be similar to those in the groundwater recharge regulations.

The proposed SMGB Groundwater Replenishment Project would not have reservoir augmentation as part of the project.

4.4.3 Requirements for Direct Potable Reuse

DPR is currently under evaluation and there are no regulatory criteria available yet. SB918 requires DDW to assess the feasibility of developing uniform criteria for DPR by December 2016. The Expert Panel will provide guidance to DDW in making this decision on DPR feasibility. Given this schedule, preliminary DPR regulations would not be available in California until perhaps by 2020. In addition to advanced purification of the recycled water, an "engineered buffer" (storage tank) would likely need to be provided for a DPR project to ensure that water quality leaving the facility always met regulatory standards. Compared to GWR, future DPR regulations are anticipated to include additional monitoring and/or treatment requirements to ensure the overall reliability of the treatment scheme, with a focus on acute risks (i.e., pathogens), critical control points, and continuous verification of treatment performance (NWRI 2014).

The two major alternatives for the safe design of DPR are 1) emphasis on the engineered storage buffer that provides time to detect and respond to a failure in treatment, or 2) emphasis on increased advanced treatment and monitoring to reduce the risk that public health would be threatened were a failure to occur. Given the reduction in response time as potable reuse moves from indirect to direct scenarios, more emphasis will likely be placed on treatment and monitoring. The required treatment technologies will likely build off of the most stringent requirements currently in place for GWR and may require additional treatment barriers.

The proposed SMGB Groundwater Replenishment Project would not have any direct potable reuse as part of the project.

Section 5. Wastewater and Recycled Water Characteristics and Facilities

5.1 Wastewater Entities

The City of Scotts Valley is responsible for wastewater services in the southern SMGB and SVWD service area. This includes wastewater collection and treatment at the Scotts Valley WRF. Disinfected secondary effluent from the Scotts Valley WRF that is not currently recycled is pumped out of the water shed and discharged to the Pacific Ocean via the existing ocean outfall pipeline for the City of Santa Cruz Wastewater Treatment Facility.

A portion of the secondary effluent at the Scotts Valley WRF is treated to Title 22 standards for tertiary disinfected recycled water, suitable for unrestricted non-potable use. The recycled water is provided to the SVWD for distribution to irrigation customers within the District's service area. The amount of recycled water produced is dependent upon the demand for recycled water.

5.2 Major Facilities

The Scotts Valley WRF is a conventional activated sludge wastewater treatment facility with a design dry weather treatment capacity of 1.5 MGD and a design peak wet weather treatment capacity of 5.0 MGD. Major facilities include an influent pump station, a flow equalization structure with 0.9 MG of storage capacity, two aeration basins with fine-bubble diffuser panels, two secondary clarifiers, a chlorine contact tank and an effluent pump station. Disinfected secondary effluent is pumped to Santa Cruz where it is discharged into the Pacific Ocean via the existing ocean outfall pipeline shared with Santa Cruz Wastewater Treatment Facility. Scotts Valley's flow constitutes approximately 8% of the flow discharged through Santa Cruz's outfall to the Pacific Ocean.

The Scotts Valley WRF includes a tertiary recycled water treatment facility with a design treatment capacity of 1.0 MGD. The facility is used to treat secondary effluent to a tertiary level using chemical coagulation and flocculation, denitrification, filtration, and UV disinfection. The recycled water meets CDPH Title 22 recycled water standards for unrestricted non-potable use. A schematic of the WRF is shown on Figure 5-1.

5.3 Additional Facilities Needed to Comply with Waste Discharge Requirements

The Scotts Valley WRF secondary effluent currently meets NPDES discharge requirements. The Scotts Valley WRF recycled water meets Title 22 requirements for unrestricted non-potable use of recycled water. No additional treatment facilities are required for secondary effluent or recycled water treatment.

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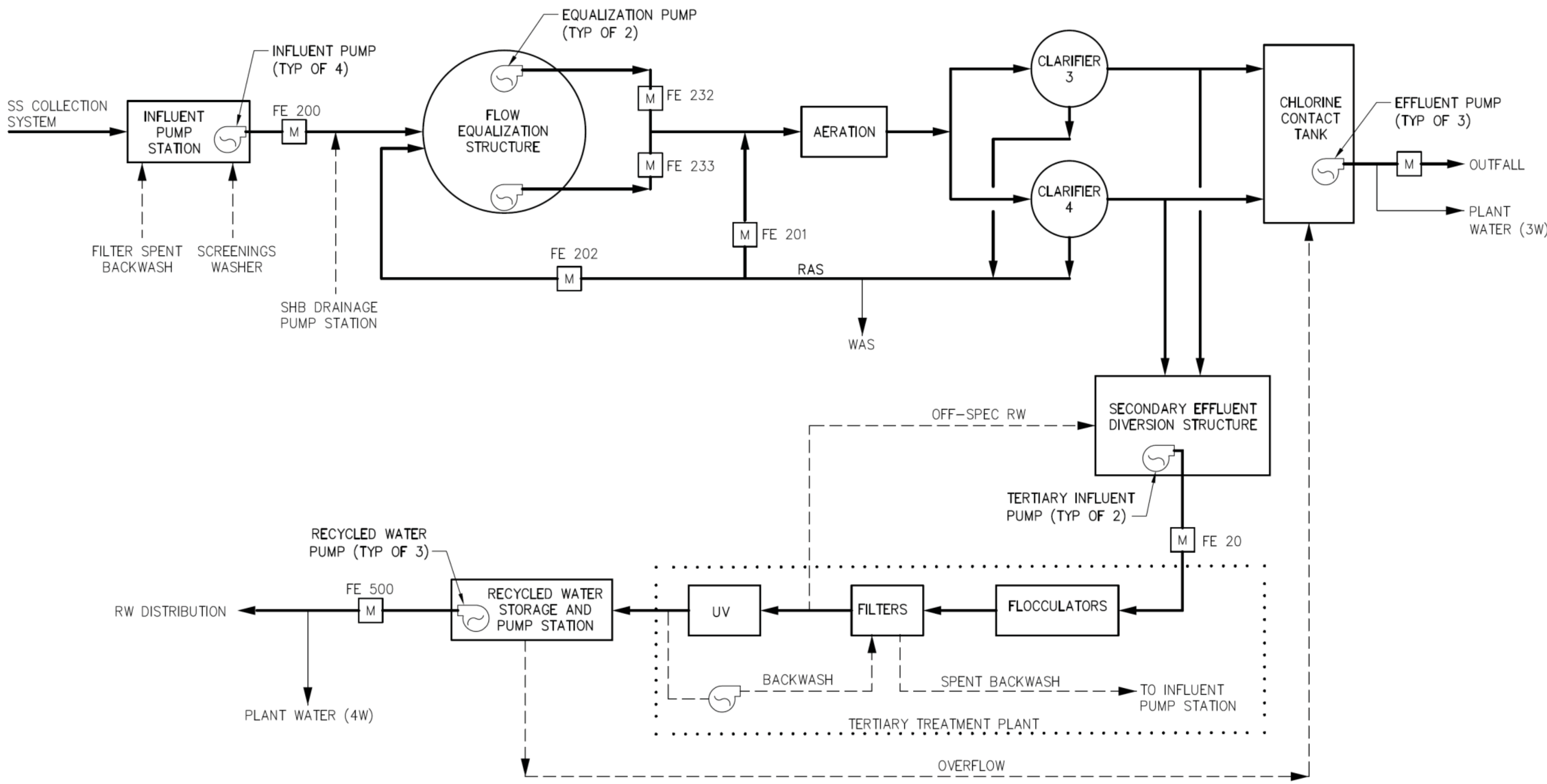

LEGEND:

M FE XXX	FLOW METER
	PUMP
——→	TREATMENT PROCESS PRIMARY FLOW
– – –→	INTERMITTENT FLOW

Kennedy/Jenks Consultants

Scotts Valley Water District
Santa Cruz County

Recycled Water Facilities Planning Report
Scotts Valley WRF Process Diagram

K/J 1568002*01

Figure 5-1

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Additional treatment is required for injection of purified recycled water into the groundwater aquifers. The treatment requirements are described in the following sections.

5.4 Sources of Industrial or Other Problem Constituents and Control Measures

There is one significant industrial user in the City of Scotts Valley, a metal finisher. This user is monitored and permitted under the City's pretreatment program. The City also operates a fat, oils and greases (FOG) program. Grease interceptors and grease trap cleaning logs are routinely monitored and inspected as part of the program. The program has been highly successful with most facilities operating in compliance with the FOG program (City of Scotts Valley, 2015).

All industrial businesses that have the potential to discharge industrial wastes to the sewer in the City are inspected on a yearly basis by the source control inspector. In 2013, most businesses were in compliance with local ordinances and implementing best environmental management practices. However, a few common areas of correction were identified in working with the food service facilities and the auto body and repair shops. (City of Scotts Valley, 2015)

The City, in collaboration with the County of Santa Cruz and other city agencies, were successful in obtaining a grant in 2008 from the California Integrated Waste Management Board (CIWMB) to implement a pharmaceutical and sharps disposal program. Since that time, the Sharp Solutions for Home Medicines Program has provided a convenient and permanent system to dispose of home-generated used sharps and unwanted pharmaceuticals in the County of Santa Cruz. The County has established 43 convenient and well-publicized drop-off locations, primarily at pharmacies, throughout the region. (City of Scotts Valley, 2015)

5.5 Existing Rights to Use of Treated Effluent after Discharge

SVWD has the right to use and distribute recycled water produced at the Scotts Valley WRF. However, currently, only a portion of the secondary treated wastewater at the Scotts Valley WRF is treated to tertiary level for recycled water use. The Scotts Valley WRF has the ability to produce up to approximately 1 MGD of recycled water as long as there is a demand for the water or a place to store the water. As noted earlier, the City has entered into agreement to provide secondary effluent to Pasatiempo for irrigation of the golf course.

5.6 Water Quality Standards for Secondary Effluent and Recycled Water

The quality of the secondary effluent and of the recycled water is subject to three different standards, shown in Table 6-1, based on the relevant permits.

- Wastewater treated to a secondary level and discharged as wastewater is subject to NDPES permit Order No. R3-2013- 0001.

- Water that is treated to a tertiary level and used as recycled water is subject to Master Water Recycling Requirements (Producer) Order No. 01-066.
- Recycled water that is provided for irrigation is subject to the Master Water Recycling Requirements (Distributor) Order No. 01-067.

The existing master water recycling permits for the producer (City) and distributor (District) facilitate the utilization of recycled water to the fullest extent possible, while providing adequate protection of public health and reducing the regulatory burden of present and future recycled water users. Section 4.2, Recycled Water Use Ordinances and Permits, includes further discussion of treatment requirements.

Table 5-1: Effluent Permits

Constituent	Treatment Level	Goal
NPDES Order. No. R3-2013-0001	Secondary	Wastewater discharge
Order No. 01-066 (Producer)	Tertiary	RW treatment requirements
Order No. 01-067 (Distributor)	Tertiary	RW distribution requirements

Note: Appendix B: includes a copy of each permit.

5.7 Secondary and Recycled Water Quality

Scotts Valley WRF consistently meets all of its effluent discharge requirements, with only six NPDES violations in the past ten years and zero in 2014. Table 5-2 shows relevant water quality from the Scotts Valley WRF Annual Report in 2014 (City of Scotts Valley, 2015) and supplemental water quality information provided by the City, and the secondary and tertiary standards where applicable.

Table 5-2: Quality of Secondary Effluent and Recycled Water from the Scotts Valley WRF

Constituent	Secondary Effluent WQ	Secondary Standard	Recycled Water WQ	Recycled Water Standard
Ave Effluent Flow (MGD)	0.613	1.5	0.168	1.0
Total Suspended Solids (mg/l)				
Ave	9.0	45	1.58	
Max	17	90	2.19	
Min	6		0.5	
BOD (mg/l)				
Ave	4	45	1.91	
Max	8	90	4.62	
Min	3		1	
Nitrate as N(*) (mg/l)				
Ave			4.2	
Max			6.8	10
Min			1.0	
Nitrogen Removal (%)				
Ave			93.4	
Max			97.3	
Min			89.8	**50**
Turbidity (NTU)				
Ave	4.1	100	0.52	5[a]
Max	6.3	225	0.95	
Min	2.6		0.08	
Total coliform (MPN/100 ml)				
Ave	3,670		8.74	
Max	10,400	100,000	34.1	2.2[b]
Min	690		1	

BOD = Biochemical Oxygen Demands
NTU = Nephelometric Turbidity Units
MPN = Maximum Probable Number
mg/l= milligrams per liter
ml = milliliter
(*) The nitrate values for the secondary effluent are from July through November, 2008

(a) Secondary Maximum Contaminant Level in 22 CCR §64449
(b) maximum median value utilizing the bacteriological results of the last seven days for which analyses exist

5.8 Recycled Water Quality for Potable Reuse

Because the tertiary filtered and disinfected recycled water would be the source water for the proposed Advance Purification Facility, additional water quality information and evaluation is required. Tables 6-3 and 6-4, below, present the water quality of the Scotts Valley WRF recycled water with respect to primary drinking water requirements and general constituent parameters associated with potable water treatment.

The Scotts Valley WRF recycled water is of relatively high quality and can be treated, with the advanced purification treatment processes described in later sections, to meet all Primary and Secondary MCLs.

Table 5-3: Quality of Recycled Water from the Scotts Valley WRF with Respect to Primary Drinking Water Maximum Contaminant Levels (MCLs)

Constituent	Units	MCL	Ave	Max (95th %ile)	Min
Inorganic Chemicals (a)					
Aluminum (Al)	ug/L	1000 (e)	228	370	100
Antimony (Sb)	ug/L	6	ND	ND	ND
Arsenic (As)	ug/L	10	2.3	2.5	ND
Asbestos (MFL = million fibers per liter; for fibers >10 microns long)	MFL	7			
Barium (Ba)	ug/L	1000	10.16	14.00	5.70
Beryllium (Be)	ug/L	4	ND	ND	ND
Cadmium (Cd)	ug/L	5	ND	ND	ND
Chromium, Total (Cr)	ug/L	50	ND	ND	ND
Chromium, Hexavalent (Cr 6+)	ug/L	10	0.03	0.03	0.03
Cyanide (CN)	ug/L	150	ND	ND	ND
Fluoride (F)	mg/L	2	0.37	0.45	0.24
Mercury (inorganic)	ug/L	2	ND	ND	ND
Nickel (Ni)	ug/L	100	ND	ND	ND
Nitrate (as N)	mg-N/L	10	4.20	7.92	ND
Nitrite (as N)	mg-N/L	1	ND	ND	ND
Nitrate + Nitrite	mg-N/L	10	4.20	7.92	ND
Perchlorate (ClO4)	mg/L	0.006	ND	ND	ND
Selenium (Se)	ug/L	50	ND	ND	ND
Thallium (Tl)	ug/L	2	ND	ND	ND
Copper and Lead (b)					
Copper (Cu)	ug/L	1300 (f)	3.24	4.4	2.6
Lead (Pb)	ug/L	15	ND	ND	ND
Radioactivity (c)					
Gross alpha particle activity	pCi/L	15	5.7	5.7	5.7
Gross beta particle activity	mrem/yr	4	29	29	29
Radium-226	pCi/L	0.05 (d)	0.21	0.27	ND

Constituent	Units	MCL	Ave	Max (95th %ile)	Min
Radium-228	pCi/L	0.019 (d)	0.81	0.81	ND
Radium-226 + Radium-228	pCi/L	5	1.02		
Strontium-90	pCi/L	8	0.87	0.87	0.87
Tritium	pCi/L	20,000	791	1000	372
Uranium	pCi/L	20	ND	ND	ND
Organic Chemicals (VOCs and SOCs) ***(d)***					
All constituents in this category not listed below were not detected. The full list of constituents and their respective MCLs are reported in Appendix C.					
1,3-Dichloropropene	ug/L	0.5	0.60	0.60	0.60
Dalapon	ug/L	200	1.80	1.80	1.80
Hexachlorocyclopentadiene	ug/L	50	0.06	0.06	0.06
Disinfection Byproducts ***(e)***					
Total Trihalomethanes (TTHMs)	ug/L	80	8.48	12	7.3
Haloacetic Acids (HAA5)	ug/L	60			
Bromate (BrO3)	ug/L	10			
Chlorite (ClO2)	ug/L	1000			
Chemicals with PHGs established					
No constituents in this category were detected. The full list of constituents and their respective MCLs are reported in Appendix C.					

MCL = Maximum Contaminant Level
%ile = Percentile
ND = Non-detect
MFL = million fibers per liter; for fibers >10 microns long
PHG = Public Health Goal
VOCs = Volatile Organic Chemicals
SOCs = Non-volatile Synthetic Organic Chemicals

(a) Primary MCLs in 22 CCR §64431
(b) Values referred to as MCLs for lead and copper are not actually MCLs; instead, they are called "Action Levels" under the lead and copper rule, 22 CCR §64672.3
(c) Primary MCLs in 22 CCR §64441 and §64443
(d) Primary MCLs in 22 CCR §64444
(e) Primary MCLs in 22 CCR §64533
(f) A secondary MCL of 200 ug/L also exists in 22 CCR §64449

Table 5-4: General Water Quality Parameters of Recycled Water from the Scotts Valley WRF

Constituent	Units	MCL	Ave	Max (95th %ile)	Min
General Physical Constituents					
Turbidity	NTU	0.2	0.52	0.99	0.08
Biochemical Oxygen Demand (BOD)	mg/L		1.91	4.62	ND
Total Suspended Solids (TSS)	mg/L		1.58	2.19	0.50
Total Organic Carbon (TOC)	mg/L		8.48	12.00	7.30
Color	CU	15 (b)	19	30	10
Temperature	ºC				
pH	units		7.51	8.00	7.00
Specific Conductance	umhos/cm	900 (a)	1035	1189	960
Odor (at 60 °C)	TON	3 (b)	19.25	40	3
Langelier Index (at 25°C)	--		0.42	0.74	0.17
Aggressiveness Index	--		12.00	12.00	12.00
General Mineral Constituents					
Total Dissolved Solids (TDS)	mg/L	500 (a)	555.21	680.00	480.00
Total Hardness (as CaCO3)	[illegible]		189.44	200.00	177.21
Alkalinity (as CaCO3)	mg/L		205.97	277.50	170.00
Calcium (Ca)	mg/L		49.00	51.00	46.02
Magnesium (Mg)	mg/L		16.86	20.00	15.16
Sodium (Na)	mg/L		111.02	140.00	5.61
Potassium (K)	mg/L		34.72	37.00	30.29
Ammonia (NH4)	mg-N/L		0.38	0.74	ND
Bicarbonate (HCO3)	mg/L		220.95	280.00	175.68
Carbonate (CO3)	mg/L		1.00	2.00	ND
Sulfate (SO4)	mg/L	250 (a)	99.74	110.00	87.00
Phosphate (PO4)	mg/L		0.31	0.31	0.31
Chloride (Cl)	mg/L	250 (a)	164.47	191.27	ND
Boron (Bo)	mg/L		0.46	0.46	0.46
Iron (Fe)	mg/L	0.3 (b)	0.0455	0.072	0.023
Manganese (Mn 2+)	ug/L	50 (b)	39	71	10
Total Silica (SiO2)	mg/L		41.44	41.44	41.44

Constituent	Units	MCL	Ave	Max (95th %ile)	Min
Silver (Ag)	mg/L	0.1 (b)	ND	ND	ND
Strontium (Sr)	mg/L				
Zinc (Zn)	ug/L	5000 (b)	50	69	42
Dissolved Gaseous Constituents					
Carbon Dioxide (CO2)	mg/L		4.90	5.80	ND

MCL = Maximum Contaminant Level
%ile = Percentile
ND = Non-detect
(a) Recommended Consumer Acceptance Contaminant Level Range in 22 CCR §64449
(b) Secondary Maximum Contaminant Level in 22 CCR §64449

5.9 Existing Wastewater and Recycled Water Flows

In 2014, the City of Scotts Valley WRF treated an average secondary influent[7] flow of 0.74 MGD during the dry-weather months of May through September, of which an average of 0.46 MGD was discharged as secondary effluent and an average of 0.28 MGD was delivered as recycled water. During the October-December 2014, the WRF treated an average secondary influent flow of 0.81 MGD of which an average of 0.73 MGD was discharged as secondary effluent and an average of 0.08 MGD was delivered as recycled water. Figure 5-2 shows the monthly influent flows to the WRF, secondary effluent to the ocean outfall, and recycled water production for 2014.

5.10 Wastewater Flow Variations

5.10.1 Seasonal Flow Variation

The City of Scotts Valley WRF exhibits typical seasonal variations in flow. Flows are largely influenced by heavy rainfall during the early and late months of the year. A total of 40 inches of rain was recorded for 2014 with the greatest monthly accumulation of 15.30 inches occurring in December. The WRF influent flow was 35.63 million gallons for December 2014 (average daily influent flow of 1.15 MGD) compared to an average influent flow during all wet-weather months (Jan - Mar, Nov-Dec) in 2014 of 0.83 MGD. Total rainfall recorded during the dry season (May through September) was 1.03 inches and the average daily influent flow was 0.74 MGD for this time period.

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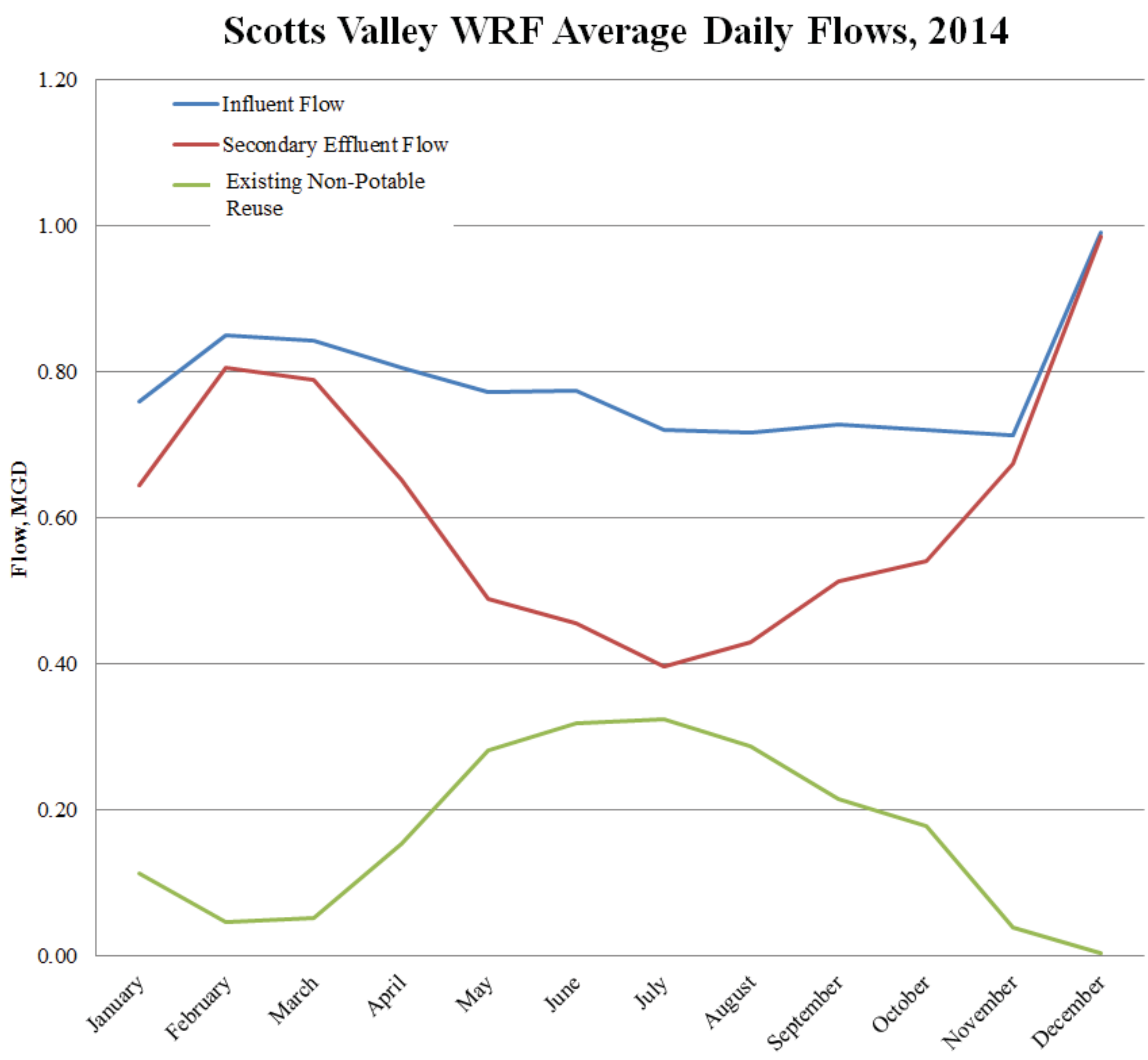
[7] The Scotts Valley WRF internal configuration is such that secondary influent is the sum of the secondary effluent to ocean discharge and secondary effluent that is treated to tertiary level for recycled water delivery.

The average annual wastewater flows in the future that could be available or advanced water purification are estimated to be 870 to 950AFY; during drought periods wastewater flows are observed to decrease. The seasonal variation in influent flows, secondary effluent flows and recycled water irrigation demands are illustrated in Figure 5-2.

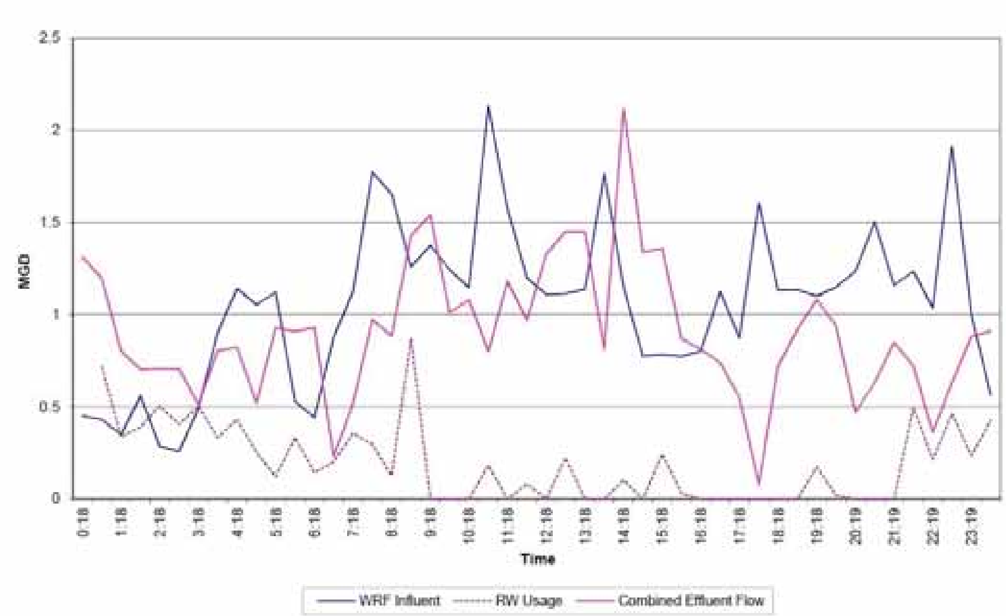
Figure 5-2: Scotts Valley WRF 2014 Daily Flows



5.10.2 Diurnal Flow Variation

Daily flows at the WRF follow a fairly consistent diurnal pattern typical for a wastewater facility that has a fairly high residential flow contribution. During a 24-hour period two peaks are obvious when flow is plotted against elapsed time. The first peak occurs in the morning from 9 am to 11 am and the second occurs in the evening from 6 pm to 8 pm as shown on Figure 5-3.

Figure 5-3: Typical Diurnal Flow



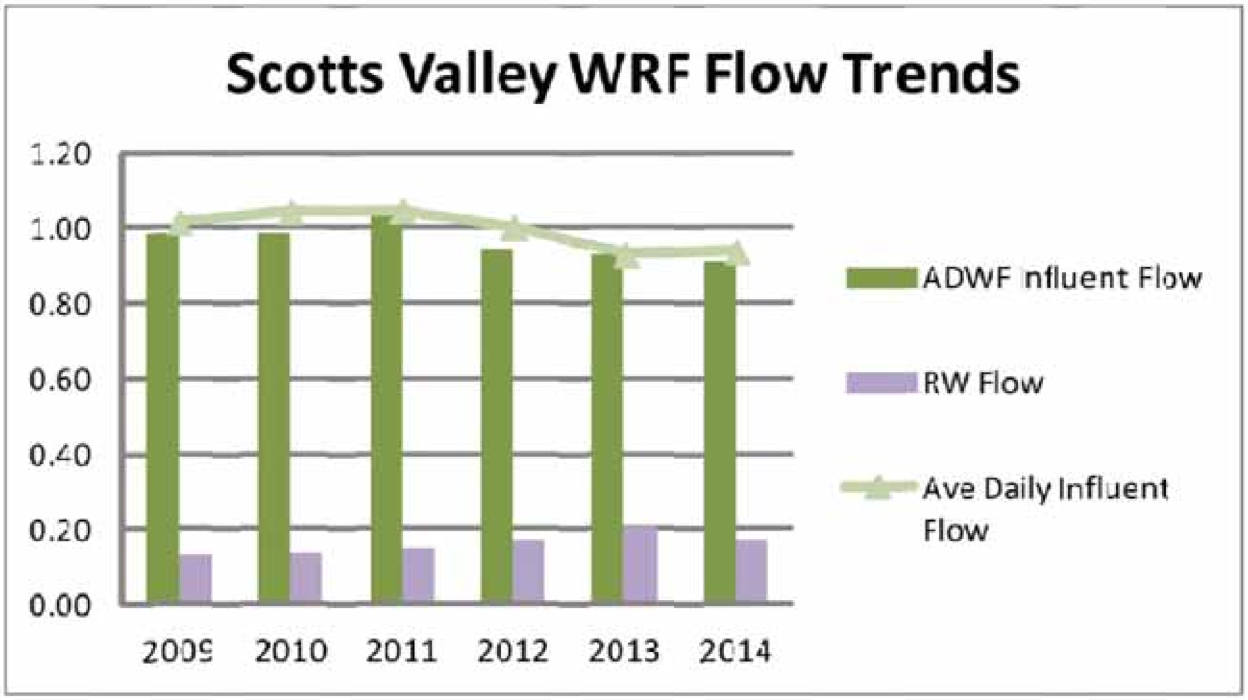
5.10.3 Recent Trends

Figure 5-4 illustrates a general decreasing trend in dry-weather flows at the WRF since 2009 except for 2011 which experienced increased dry-weather flow, likely due to higher than normal rainfall recorded in May and June of 2011. 2012-2014 was amongst the driest years in history in Scotts Valley and Santa Cruz County.

Recycled water demand has continued to gradually increase except 2013-2015 which saw a decrease in recycled water demand from previous years, likely due to ongoing conservation measures in Scotts Valley in response to the drought, including replacement of high-demand landscaping with drought-tolerant landscaping and public awareness of drought conditions.

The recent trends in dry-weather flow are similar to trends seen in other California communities. Generally, these trends are attributable to increased awareness of water usage and corresponding conservation, installation of low-flow plumbing fixtures, and the replacement of existing water-dependent appliances, such as washing machines and dishwashers, with more efficient units.

Figure 5-4: Scotts Valley Wastewater And Recycled Water Flow Trends



Section 6. Advanced Purification Treatment Technologies

The purpose of this section is to present available water treatment technologies to meet the DDW requirements for the advanced purification of recycled water to permit injection into the Lompico aquifer.

6.1 Advanced Purification Treatment Requirements

As discussed in Section 4, the recharge water (purified water) must receive overall treatment that achieves at least 12-log enteric virus reduction, 10-log *Giardia* cyst reduction, and 10-log *Cryptosporidium* oocyst reduction, referred to as the 12-10-10 log removal.

In addition, the recharge water must meet drinking water quality requirements for chemical constituents. Based on current water quality monitoring, the tertiary recycled water from Scotts Valley WRF already meets the majority of these requirements without additional treatment. Selected water quality constituents that are above drinking water standards, which would be treated through the Advanced Purification Facility (APF) which provides FAT are listed in Table 6-1. Table 6-1 is based on a comparison of water quality objectives for GWR and historical water quality data for tertiary recycled water produced at Scotts Valley WRF (summarized in Table 5-2, Table 5-3, and Table 5-4).

Table 6-1: Selected Tertiary Water Quality and GWR Treatment Objectives

Parameter	Units	Average Tertiary Water Quality	GWR Water Quality Objective
Total Dissolved Solids	mg/L	555	500
Specific Conductance	umhos/cm	1035	900
Total Organic Carbon	mg/L	9.27	≤ 0.5 (a)
Odor	TON	19.25	3
1,3-Dichloropropene	ug/L	0.6	0.5
Gross Beta Particle Activity	mrem/yr	29	4
Radium-226	pCi/L	0.21	0.05 (b)
Radium-228	pCi/L	0.81	0.019 (b)

TON = Threshold Odor Number

(a) Although the overall MCL for GWR is 0.5 mg/L there are more stringent restrictions for GWR projects using RO treatment. During the first twenty week of operation of a project using RO membrane treatment, no more than 5 % of sample results may have a TOC concentration > 0.25 mg/L.

(b) Public Health Goal, not Maximum Contaminant Level

6.2 Advanced Treatment Technologies

The following treatment technologies have been identified defined by the California DDW as the required treatment processes for groundwater replenishment through injection:

Microfiltration/Ultrafiltration (MF/UF) is a membrane-based, pressure-driven filtration process that uses hollow fiber membranes to provide a barrier to the passage of solids measured by turbidity and suspended solids) and microorganisms (including bacteria, protozoan pathogens, and some viruses). The MF membranes have nominal pore sizes of 0.1 microns and the UF membranes have nominal pore sizes of 0.02 microns and filter particles from the water by physical size separation. The MF/UF membranes do not remove salts (i.e., TDS) or other dissolved constituents that are smaller than the membrane filter pore size. The MF/UF fiters periodically backwash to remove the captured suspended solids. The spent washwater is returned to the head of the WRF for treatment.

Reverse osmosis (RO) is a pressure-driven membrane separation process in which dissolved compounds (i.e., TDS and organic material) are separated from the solution by forcing the water through a semi-permeable membrane. Reported performance of TDS removal by RO is 90 to 98 percent (Tchobanoglous et al. 2004). RO also removes nearly all organic compounds, such as endocrine-disrupting compounds (EDCs) and pharmaceuticals and personal care products (PPCPs). RO produces product water that is demineralized (low TDS) and a concentrated (high TDS) water that is discharged.

Ultraviolet (UV) disinfection transfers electromagnetic energy from a mercury arc lamp to water, emitting a broad spectrum of radiation with intense peaks at certain wavelengths. UV light penetrates an organism's cell walls and disrupts the cell's genetic material, making reproduction impossible. With the proper dosage, UV irradiation has proven to be an effective disinfectant for bacteria, protozoa, and virus in water, while not contributing to the formation of disinfection byproducts (DBPs).

Ultraviolet-based advanced oxidation process (UV-AOP) transfers electromagnetic energy from a mercury arc lamp to an auxiliary oxidant that has been added to the wastewater. Examples of auxiliary oxidants include hydrogen peroxide, ozone or chlorine. Photo-excited oxidants quickly degrade to form highly reactive free radicals (e.g. hydroxyl radical, chlorine atom). These radicals are strong oxidants capable of degrading most natural and synthetic organic compounds present in wastewater at rates three to four orders of magnitude greater than typical chemical oxidants (Asano et al. 2007).

6.3 Proposed Advanced Purification Treatment Process

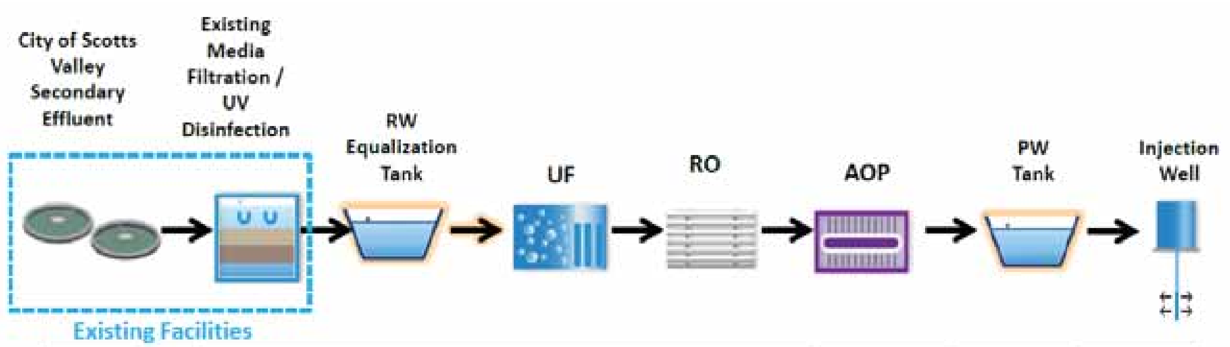
The following treatment process elements are proposed for the Project APF, shown on Figure 6-1:

- Ultrafiltration to remove suspended particles and pathogens.

- Reverse Osmosis to remove dissolved organics and salts.
- UV-AOP to oxidize and reduce any remaining low-level constituents.
- Chlorine addition to provide a disinfectant residual to the injection facilities.
- Aquifer residence time to provide an environmental buffer.

This treatment train will meet all of the treatment requirements for pathogen removal as well as maximum contaminant levels (MCLs) for chemical constituents. Figure 6-1 enumerates the anticipated pathogen log-removal/inactivation credits for each treatment process.

Figure 6-1: Proposed Full Advanced Treatment Train and Log Removal Credits



	Target Process Log Removal / Inactivation Credits								
Treatment Processes	Scotts Valley WWTP	Scotts Valley WRF	UF	RO	UV/ AOP	Aquifer	Total Log Removal/ Inactivation	DDW Required Log Removal/ Inactivation	Additional Log Safety Factor
Pathogen									
Virus	1	4	0	1	6	6	18	12	6
Giardia	1	1	4	1	6	0	13	10	3
Crypto	1	1	4	1	6	0	13	10	3

A more detailed process flow diagram of the recommended APF process elements is shown on Figure 6-2 and calculations are found in Appendix D. The proposed advanced purification process elements are described in the following sections.

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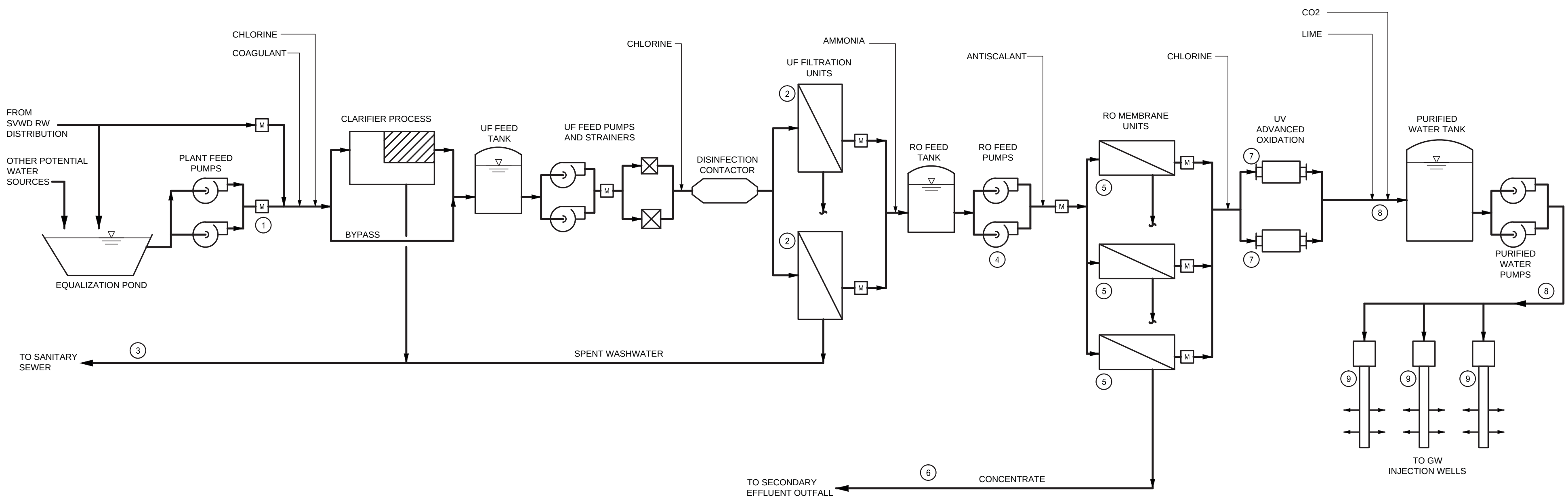

SVWD APF Process Flow Diagram - Flow and Water Quality Table

Process Point	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Process Name	**APF Feed**	**UF Unit Feed**	**Spent WW**	**MF Filtrate/ RO Feed**	**RO Unit Feed**	**RO Concentrate**	**RO Permeate/ AOP Unit Feed**	**Purified Product Water**	**Injection Well Unit Flow**
Max. Design Flowrate, gpm	700	700	35	665	222	113	552	552	184
Avg. Design Flowrate, gpm	420	420	21	399	200	68	331	331	110
Min. Design Flowrate, gpm	230	230	11.5	219	219	37	181	181	91
Typical TDS, mg/L	800	800	800	800	800	4706	30	60	60
Typical TOC, mg/L	15	15	15	11.3	11.3	66	0.5	0.5	0.5

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RECYCLED WATER FACILITIES PLANNING REPORT
PROCESS FLOW DIAGRAM FOR HANSON QUARRY
ADVANCED PURIFICATION FACILITY

1568002.01

FIGURE 6-2

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6.3.1 Recycled Water Equalization Tank and Pump Station

The Recycled Water Equalization Tank would provide storage volume for balancing the recycled water production from the Scotts Valley WRF with the feed of the recycled water to the APF processes. Lead and standby recycled water pumps would pump the water to the APF site for advanced treatment.

6.3.2 Coagulant Addition

A small dose of aluminum chlorohydrate (ACH) coagulant would be added upstream of the UF Feed Pumps to help with organics removal and to minimize fouling of the UF membranes.

6.3.3 UF Feed Pumps and Strainers

Two parallel automatic feed strainers would protect the membrane filters from damage by large particles in the source water. The strainers would remove particles down to a nominal 300-micron size. Each strainer would be sized to handle the full source water flow rate; however, the units normally operate in parallel to minimize head loss across the system.

6.3.4 UF Filtration

UF is a membrane treatment process that utilizes physical straining to remove particulate matter from water. The typical pore sizes associated with UF (0.02 microns) provide an absolute barrier to larger particles and microbes, including bacteria, *Giardia lamblia* cysts, and *Cryptosporidium* oocysts. The small pore sizes allow membrane treatment processes to consistently produce high quality filtered water over a wide range of source water quality and turbidity.

The APF would have two UF membrane units, each sized to provide up to a maximum of 1 MGD production. The units would be operated with one primary unit and one standby unit to allow one UF unit to stop production for backwashing, integrity checks and maintenance cleans, while the other unit continues to produce filtered water for the downstream RO system.

The backwash water from the UF system would be returned to the head of the Scotts Valley WRF for treatment.

6.3.5 RO Feed Tank

A break tank between the UF system and the RO system would be provided for operational flexibility and to provide a source of backwash supply water for the UF units. The break tank simplifies the operations and controls of the overall process, and more easily permits continuous operation of the RO systems while the UF systems start and stop for backwash and maintenance clean operations.

6.3.6 RO Booster Pumps

Two RO system booster feed pumps would draw water from the RO Feed Tank and provide feed water at approximately 40 psi for the RO system. The RO booster pumps would send the water through RO cartridge filters and pressurize the water for the high-pressure RO pumps on each RO skid. Antiscalant would be dosed ahead of the RO units to prevent scale formation in the RO membrane system.

6.3.7 RO Membrane Separation

The RO system would consist of three RO units to produce product water over the range of flowrates expected from the available recycled water flow. Unlike the UF unit, the RO system cannot be easily turned down to accommodate lower flows. At low recycled water availability, one RO unit would operate; at moderate availability, two RO units would operate; and during the winter when the most recycled water is available, three RO units would operate. Multiple RO units provide system flexibility and reliability while permitting increased or reduced permeate flow with varying tertiary recycled water availability.

The RO system high-pressure pumps would operate at approximately 120 to 150 psi based on the relatively low salinity of the recycled water. At this conceptual stage, the RO units are proposed to be standard type units that would operate at approximately 80-percent recovery. Alternative RO systems, such as closed circuit desalination (CCD) RO could be evaluated at later phases of project development.

The concentrate stream from the RO units would be approximately 20-percent of the feed flow and would have salt levels of approximately 3,000 to 4,000 mg/l. This concentrate stream would be discharged to the existing City of Scotts Valley outfall pipeline which connects to City of Santa Cruz wastewater effluent outfall to the Pacific Ocean. The additional salt in the discharge would not affect the current discharge limits for the existing ocean outfall.

6.3.8 UV Advanced Oxidation

Sodium hypochlorite would be added to the product water from the RO system, upstream of the UV system to act as an auxiliary oxidant for the AOP.

The UV-AOP system would consist of two UV units, one primary and one standby, each sized for the full system production capacity. A UV dose of 900 mJ/cm^2 would provide simultaneous virus disinfection credits and the required energy to generate free radicals for trace organics removal.

6.3.9 Purified Water Stabilization

Following the UF, RO and UV-AOP advanced treatment process, the product water would contain very few dissolved minerals and is corrosive. The purified water must be stabilized through mineral addition to reduce the corrosivity of the water and properly condition the water for injection into the groundwater aquifer. Lime (calcium hydroxide) and carbon dioxide would be added after the UV-AOP treatment to stabilize the water.

6.3.10 Purified Water Tank and Pump Station

The Purified Water Tank would provide storage volume for balancing the purified water production with the delivery of purified water to the GW injection system. Lead and standby purified water pumps would pump the water from the APF site to the location of the groundwater injection wells.

6.3.11 GW Injection Wells

The purified water would be injected into the Lompico aquifer through three groundwater injection wells. The expected recharge rate for each well is in the range of 200 to 300 gpm. The multiple injection wells permit injecting the expected range of purified water flowrates. The multiple wells would also provide flexibility and redundancy and permit taking a well out of service for maintenance in the summer when non-potable recycled water demand is higher and recharge rates would be lower.

6.4 Proposed Advanced Purification Facility Locations

The existing recycled water production facilities at the Scotts Valley WRF are permitted for non-potable use. The APF would further treat the tertiary recycled water and would have a maximum treatment capacity of 1 MGD. Three APF treatment locations were developed for this report:

(1) APF co-located with the City of Scotts Valley's WRF

(2) APF located on a portion of the Hanson Quarry property.

(3) APF located on SVWD property at El Pueblo Well site

Additional locations for the proposed APF could be evaluated in future phases of the project development. Figure 6-3 and Figure 6-4, and Figure 6-5 at the end of this section, show conceptual facility layouts for the APF at the Scotts Valley WRF, at Hanson Quarry, and Scotts Valley El Pueblo sites, respectively.

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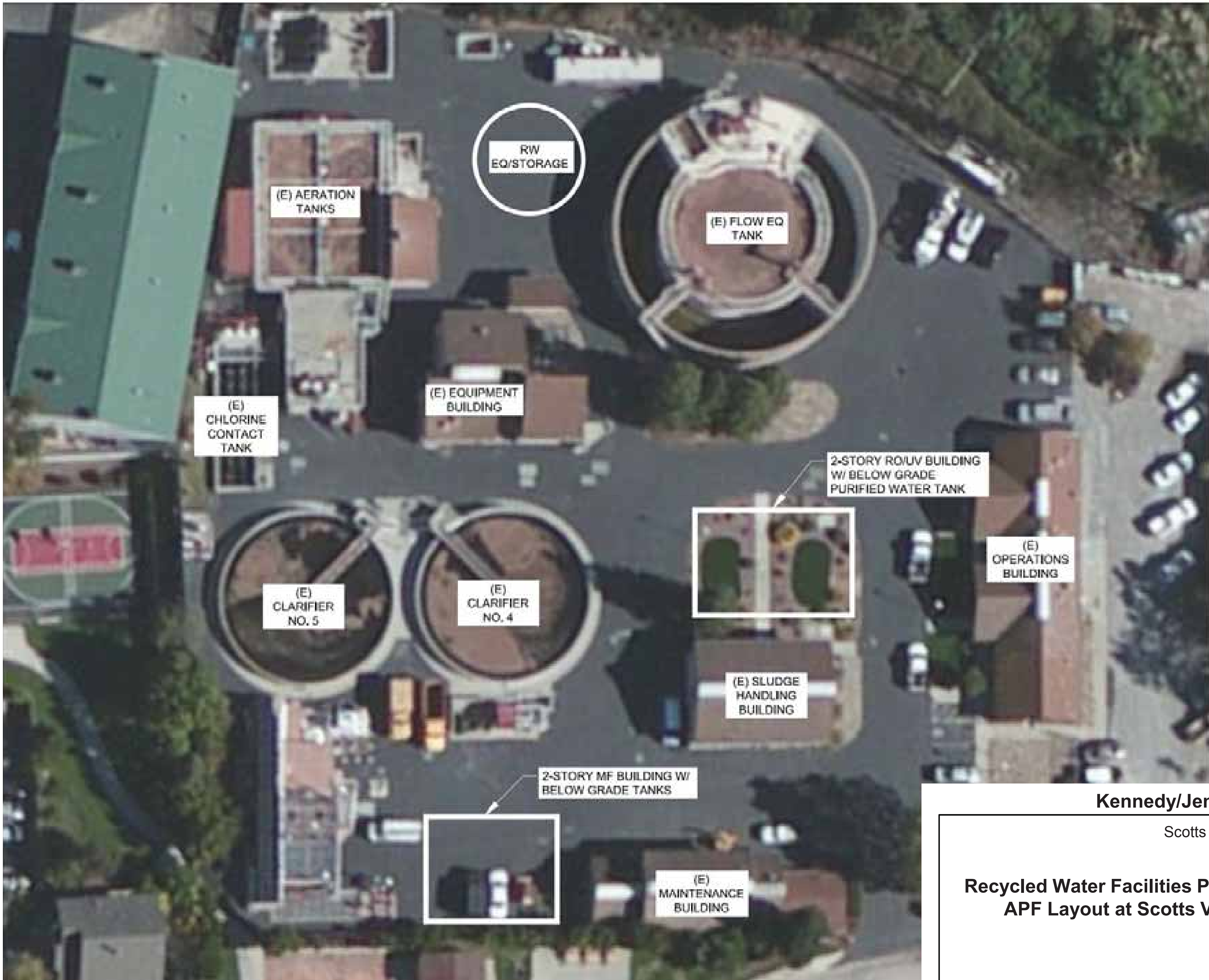

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Santa Cruz County

Recycled Water Facilities Planning Report
APF Layout at Scotts Valley WRF Site

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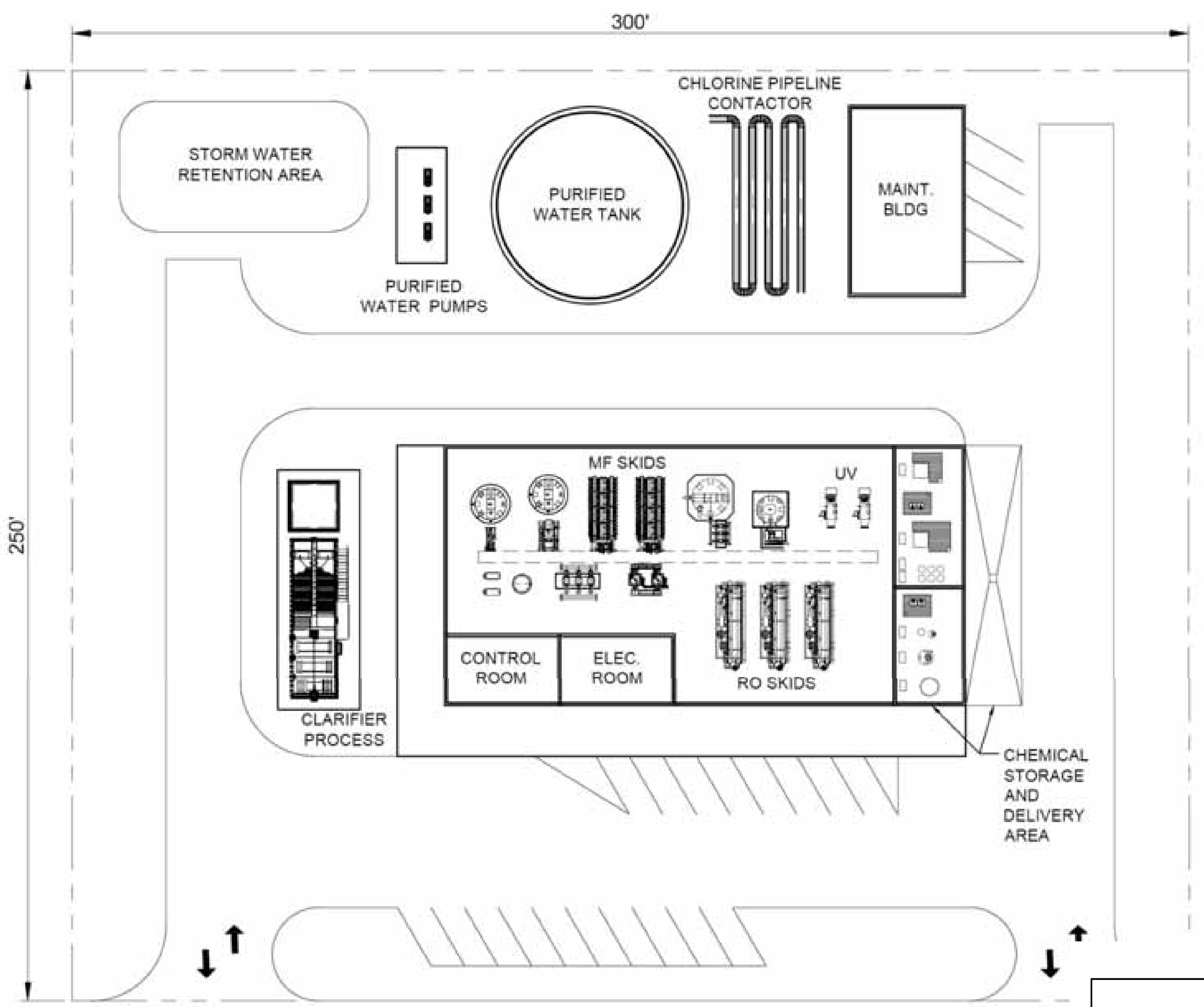
Figure 6-3



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Recycled Water Facilities Planning Report
APF Layout at Hanson Quarry Site

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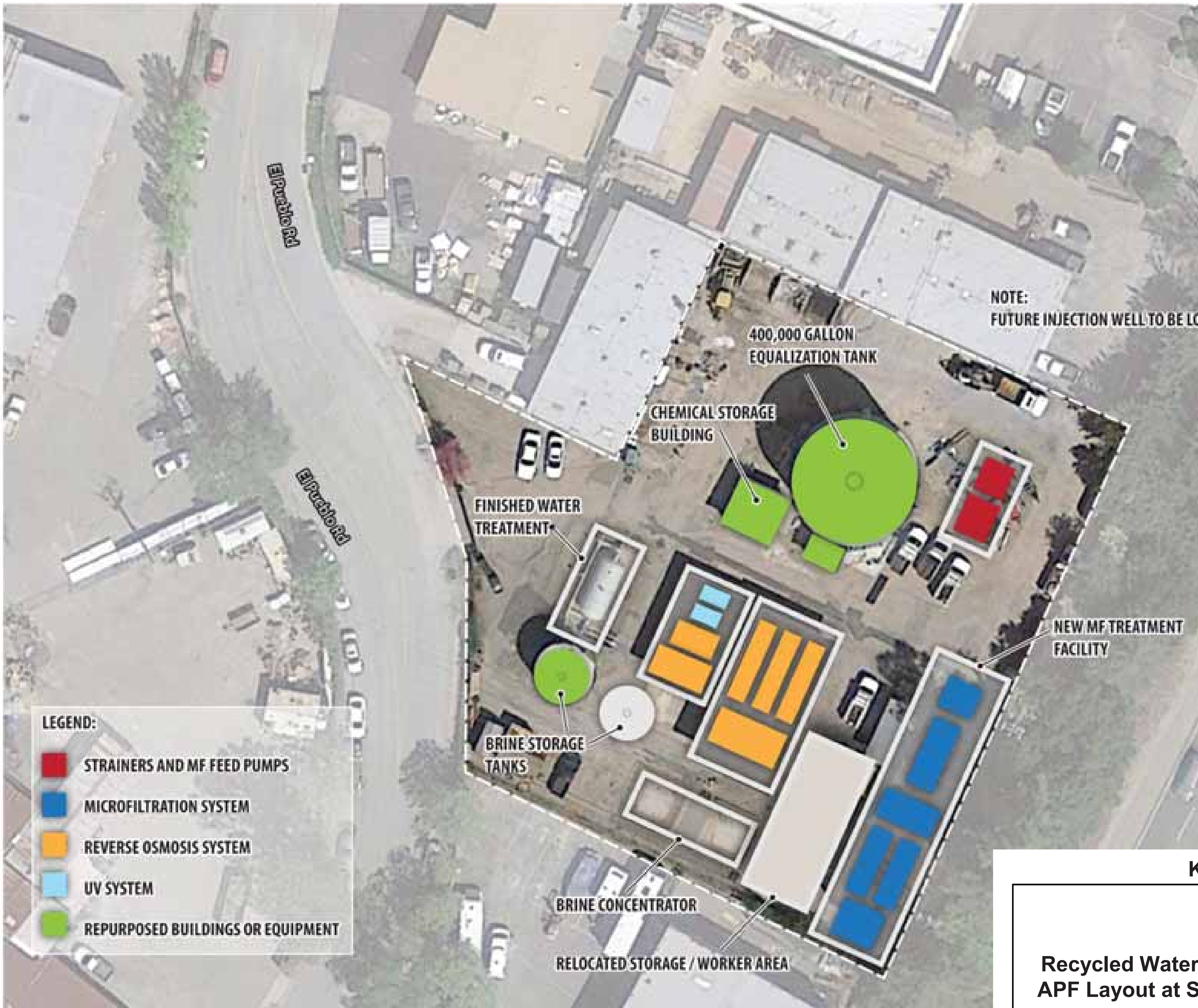
Figure 6-4



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Recycled Water Facilities Planning Report
APF Layout at Scotts Valley El Pueblo Site

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Figure 6-5

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Section 7. Recycled Water Market Assessment

The recycled water market assessment identifies potential users of recycled water within the project area. Two primary markets are considered and evaluated: 1) expanding the market for non-potable reuse using disinfected tertiary recycled water, and 2) the potential use of purified water for groundwater replenishment into the Lompico aquifer.

7.1 Summary of Existing Customers

The District currently serves 51 non-potable sites for an annual average demand in 2015-2016 of approximately 200 AFY. Some sites have multiple services. The Recycled Water Market Assessment for non-potable reuse originally developed in the 2009 Facilities Planning Report (FPR) (Kennedy/Jenks, 2009) identified the potential market for expanding and increasing disinfected tertiary recycled water use within the project area. Eighteen customers were added to the system and are receiving recycled water since completion of the 2009 FPR. Recently, the District implemented several recycled water projects, including:

- In 2010, the District completed 3 main extension projects: Victor Square, Hacienda Dr, & Bean Creek Rd. Funding from Proposition 50, 2008 Urban Drought Assistance Grant Program was used to complete these projects. The 3 projects combined totaled 4,265 feet of 6"main installed and will allow for future customers.

- In 2013, the District completed the Blue Bonnet main extension project that totaled 1,312' of 6" main installed and will allow for future customers.

Table 7-1 summarizes the existing sites, service numbers and recent annual demand, and Figure 7-1 illustrates the location of existing customers.

Table 7-1: Summary of Existing Recycled Water Demands for July 1, 2015-June 30, 2016

Site No.	Service ID	Site Name	Annual Demand (AFY)
1	R3754	259 Mt Hermon Road	0.0
2	R3707	Bean Creek/Erba Ln	0.76
3	R3706	Erba Ln/Civic Center	0.18
4	R483	Baymonte Christian School	0.07
5	R3787	Skypark	23.42
6	R2115	Siltanen Park	12.62
7	R3643	Palo Alto Medical Foundation	0.13
8	R3645, R3645B	Windward Place HOA	0.3
9	R3633	Acorn Court Apartments	1.51
10	R3790	Siltanen Booster Station	0.0
11	R3677	Scotts Valley High School	17.85
12	R222	SVWD	0.12
13	R2771	Seagate/Bay Photo	0.0
14	R440	Scotts Valley Fire Department	0.04
15	R1254, R3200, R3201	Enterprise Technology Center	20.39
16	R1091	McDorsa Park	4.56
17	R3921, R3922	Glenwood Scotts Valley HOA	5.73
18	R3873	Spring Lakes Park	54.23
19	R1142	AOI Parking Lot	0.15
20	R960	Hocus Pocus Park	1.96
21	R457	San Augustine Church	0.73
22	R3656, R3657	Emerald Hills Apartments	2.03
23	R309	Vine Hill Elementary	3.96
24	R3258	Scotts Valley Square	1.14
25	R2163	Tree Circus Ctr, 4652 Scotts Valley Dr	0.0
26	R2889, R3018, R3019, R3021	Vineyards Residential	19.79
27	R3047	Scotts Village	2.16
28	R1702	Willow Pond Association	2.04
29	R3943	Universal Audio	1.01
30	R1456	Scotts Valley Middle School	4.69
31	R1131	Easton Sports, 5550 Scotts Valley Dr	2.74
32	R2138	The Perfumers Apprentice. 100-170 Tech Circle	0.46
33	R3114	Whispering Pines Business Center	0.09
34	R1780	Scotts Valley Audio Center	0.09
35	R2406	Graham Plaza	0.25
36	R2139	GC2 Associates LLC	0.43
37	R1128	Jack In The Box	0.19
38	R2166	Digital Dynamics	0.19
39	R2865	Granite Creek Business Center	3.22
40	R1752	Bank Of America	0.0
41	R358	Shell Station, 1 Hacienda Dr	0.08
42	R1572, R4101, R4116, R4140	Woodside HOA	4.11
43	R1214	Santa Cruz Metro	0.05

Site No.	Service ID	Site Name	Annual Demand (AFY)
44	R3079	5401 Scotts Valley Drive	0.29
45	R3963	SV Library,251 King's Village Rd	0.05
46	R1494	SV Senior Center/370 King's Village Rd	0.0
47	R3048	SV Community Center/360 King's Village Road	0.00
48	R4034	Towncenter	0.54
49	R2769	Canepa Motors	0.72
50	R0616	Bailey Properties	0.55
51	R4150	The Manor	0.11
	Total Existing (51 Sites)		**196 AFY**

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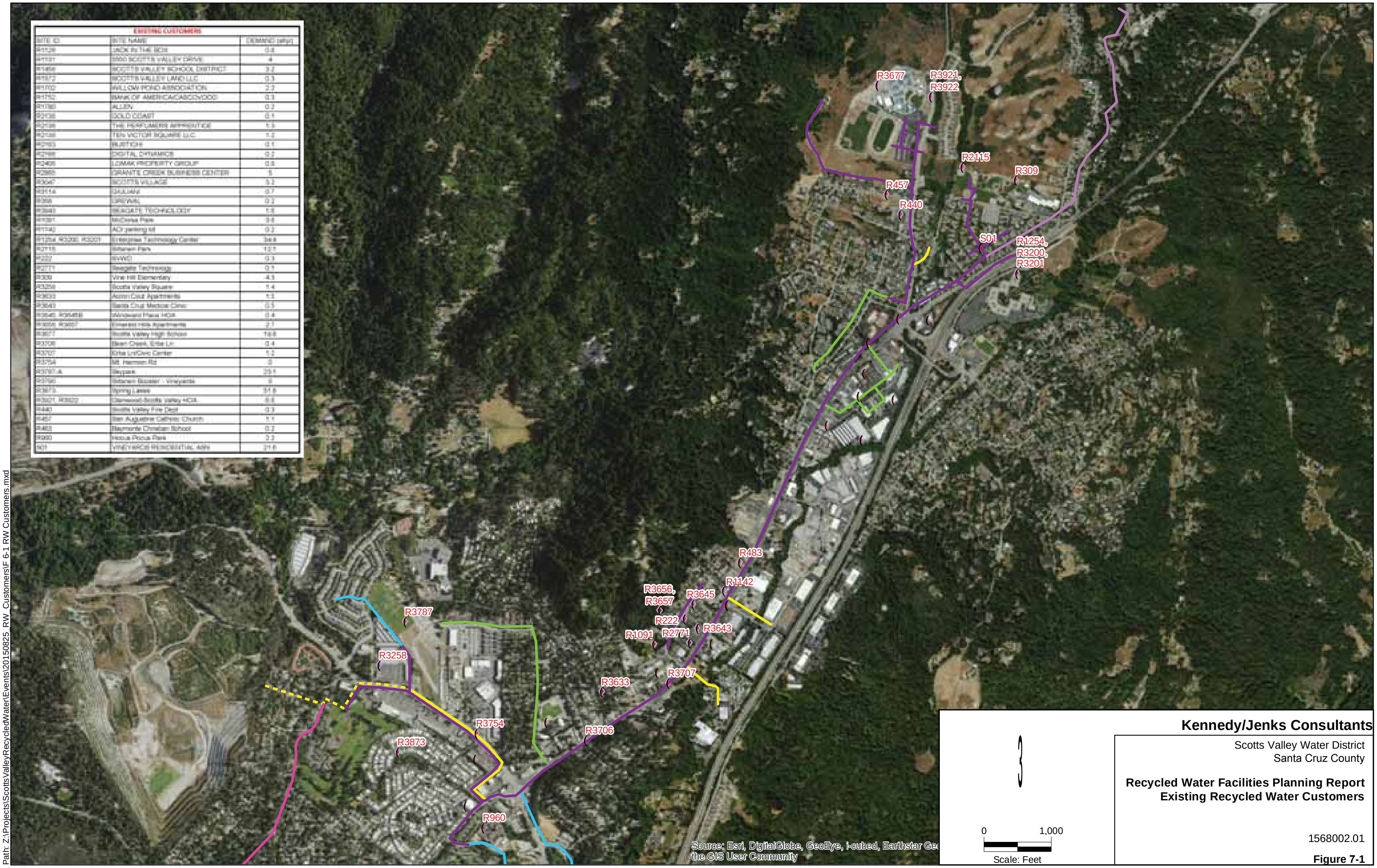

EXISTING CUSTOMERS		
SITE ID	SITE NAME	DEMAND (afy)
R1128	JACK IN THE BOX	0.8
R1131	5000 SCOTTS VALLEY DRIVE	4
R1456	SCOTTS VALLEY SCHOOL DISTRICT	3.2
R1572	SCOTTS VALLEY LAND LLC	0.3
R1702	WILLOW POND ASSOCIATION	2.2
R1752	BANK OF AMERICA/CASCO/VOOD	0.3
R1780	ALLEN	0.2
R2136	GOLD COAST	0.1
R2138	THE PERFUMERS APPRENTICE	1.5
R2140	TEN VICTOR SQUARE LLC	1.2
R2163	BUSTICHI	0.1
R2166	DIGITAL DYNAMICS	0.2
R2406	LOMAK PROPERTY GROUP	0.8
R2865	GRANITE CREEK BUSINESS CENTER	5
R3047	SCOTTS VILLAGE	5.2
R3114	GIULIANI	0.7
R358	GREWAL	0.2
R3640	SEAGATE TECHNOLOGY	1.8
R1091	MacDorsa Park	3.6
R1142	ACI parking lot	0.2
R1254, R3200, R3201	Enterprise Technology Center	34.8
R2115	Siltanen Park	12.1
R222	SVWD	0.3
R2771	Seagate Technology	0.1
R309	Vine Hill Elementary	4.3
R3258	Scotts Valley Square	1.4
R3633	Acorn Court Apartments	1.3
R3643	Santa Cruz Medical Clinic	0.5
R3645, R3646	Windward Place HOA	0.4
R3656, R3657	Emerald Hills Apartments	2.7
R3677	Scotts Valley High School	19.8
R3706	Bean Creek, Erba Ln	0.4
R3707	Erba Ln/Civic Center	1.2
R3754	Mt. Hermon Rd	0
R3787-A	Skypark	25.1
R3790	Siltanen Booster - Vineyards	0
R3873	Spring Lakes	51.8
R3921, R3922	Glenwood-Scotts Valley HOA	8.8
R440	Scotts Valley Fire Dept	0.3
R457	San Augustine Catholic Church	1.1
R483	Baymonte Christian School	0.2
R960	Hocus Pocus Park	2.2
S01	VINEYARDS RESIDENTIAL 40IN	21.6

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Santa Cruz County

Recycled Water Facilities Planning Report
Existing Recycled Water Customers

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Figure 7-1

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7.2 Expanded Non-Potable Reuse Market Assessment

The intent of the Non-Potable Reuse Water Market Assessment is to identify the potential market for additional use of disinfected tertiary recycled water within the project area.

The 2009 FPR evaluated existing customers with large irrigation demands and future developments to identify potential recycled water customers and associated demands. The 2009 FPR Market Assessment has been updated to take into account sites that have been converted for recycled water use since 2009 and to identify any new potential customers.

Annual, monthly, and daily and peak demands were estimated using existing meter data and/or demand factors to determine the quantity of recycled water that would need to be reliably supplied for irrigation. Interior reuse customers (i.e. dual plumbing) are not included in the Market Assessment because the demand for recycled water for interior use is relatively low. Therefore, the modest interior reuse demands would not have a significant impact on the size and design of the delivery and production system. Some new buildings have been considered for dual-plumbing but are not located close enough to the recycled water infrastructure and infrastructure extensions are not merited given the low demand. Existing buildings that have not been constructed with dual-plumbing systems can be complex and expensive to retrofit, and therefore, such sites would only be considered potential customers if a high demand use, such as a cooling tower which can be easily separated from the potable water system.

Demands for potential recycled water customers are estimated using historical meter data. Potential irrigation customers are grouped based on (1) the historical irrigation demand of each customer (from meter data) and (2) the distance from the existing recycled water conveyance pipelines. The 2009 FPR established four tiers of potential irrigation customers and grouped those customers according to demand size and proximity to existing pipeline. The updated number of potential customer sites and estimated demands for each tier are summarized Table 7-2.

Table 7-2: Tiers of Potential Future Recycled Water Users

Tier	Customer Type	Number of Sites	Total Potential Ave Annual Demand
			AFY
1 - SVWD Customers	Infill Customers	17	35
	New Infrastructure (< ½ mile)	14	30
2 - SVWD Customers	Minor Extensions & Mt. Hermon Replacement	12	30
	Tier 1 and 2 Subtotal	43	95
3 - SVWD Customers	New Infrastructure (> ½ mile)	13	21
	Distant and Future Sites	14	170
TOTAL		70	286

Although the total potential market for non-potable reuse expansion is estimated to be approximately 286 AFY, Pasatiempo Golf Course accounts for 107 AFY of demand for secondary effluent while the Tier 1 and Tier 2 customers, which are more likely to connect, account for about 95 AFY, Most large non-potable water customers that are close to existing infrastructure are already using recycled water, and those remaining potential SVWD customers have relatively small demands which can be expensive to connect.

Pasatiempo Golf Course is the largest single new user of secondary effluent and is located outside of the SVWD service area. An additional factor for considering the viability of serving new customers is that the demand is highly seasonal, with most of the demand occurring in the summer irrigating months at a time when the availability of recycled water is lowest.

7.3 Market Assessment for Groundwater Replenishment

The Conjunctive Use Project (Kennedy/Jenks, 2011) evaluated potential types of recharge and locations for aquifer recharge. Potential types of active recharge that were evaluated were: percolation ponds, leach fields and injection wells. The primary groundwater aquifers in the Santa Margarita Groundwater Basin in the Scotts Valley area are the Santa Margarita Sandstone (Santa Margarita), the Lompico Sandstone (Lompico) and the Butano Formation (Butano). The Butano Formation is exposed at the surface only in the northern parts of the basin and occurs at depths greater than 1,000 feet below Scotts Valley. Therefore, the Butano is not considered as a candidate for replenishment with recycled water. The Santa Margarita and Lompico Sandstones are both considered viable for groundwater recharge. (Kennedy/Jenks, 2009)

Five areas were evaluated for recharge in the Conjunctive Use Project, as follows:

- **The South Hanson Quarry.** The area west of the City of Scotts Valley where the Santa Margarita and Lompico aquifers are in direct contact. The site is associated with the southern portion of Hanson Quarry which represents a large area of potentially available land and includes a large depression where runoff from Hanson Quarry collects. This area was considered as a potential storage or infiltration pond. The analysis also applies to the areas adjacent to Hanson Quarry where the Santa Margarita and Lompico aquifers are in contact. Recharge in these areas is expected to restore groundwater in both the Santa Margarita and Lompico aquifers.
- **The North Hanson Quarry.** The area west of the City of Scotts Valley downgradient of the area where the Santa Margarita aquifer directly overlies the less permeable Monterey formation. The site is associated with the northern portion of Hanson Quarry which represents a large area of potentially available land. The analysis applies to the adjacent areas as well. Recharge in these areas is expected to restore groundwater in Santa Margarita aquifer only.
- **The Camp Evers area.** The area where the Santa Margarita aquifer has experienced the largest groundwater level declines. This area is generally along Mount Hermon Road in the western portion of the City of Scotts Valley. Recharge in this area is expected to restore groundwater in Santa Margarita aquifer only.
- **The South Scotts Valley area.** The location where the Santa Margarita and Lompico aquifers are in direct contact and the Monterey formation is absent. This area is generally along Scotts Valley Drive in the southern portion of the City of Scotts Valley. Recharge in this area is expected to restore groundwater in both the Santa Margarita and Lompico aquifers.
- **The North Scotts Valley area.** The area where the Santa Margarita aquifer is underlain by the Monterey formation along Scotts Valley Drive in the northern portion of the City of Scotts Valley.

Based on the in-depth hydro-geological modeling of the SMGB using the calibrated MODFLOW model and database of the basin and the different SMGB aquifers, the Lompico aquifer was identified as the most feasible aquifer for groundwater replenishment. The model also showed that percolation ponds and leach fields would not be as effective in recharging the Lompico aquifer. The complex geologic variability of the SMGB results in a very slow natural recharge process for the Lompico and Butano aquifers. The most effective means of active groundwater replenishment is injection of water with groundwater injection wells. The hydro-geological assessment of the Lompico aquifer with injection of purified water is presented in Section 8.

7.4 All Users and Categories of Potential Users

Table 7-3 summarizes the results of the market assessment for irrigation customers and groundwater replenishment.

Table 7-3: All Potential Recycled Water Uses

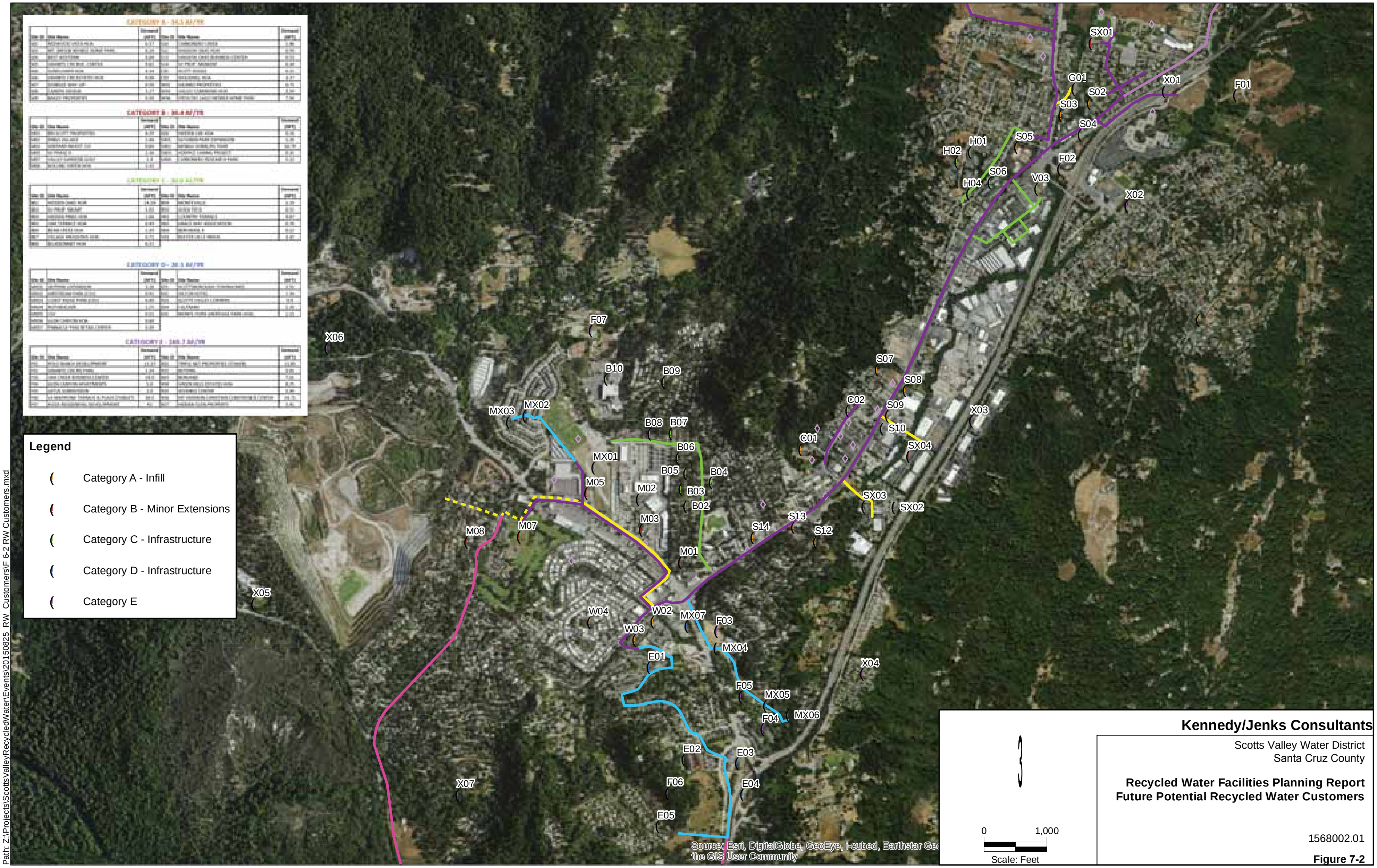
Customer Type	Number of Sites	Total Potential Ave Annual Demand AFY
Existing Irrigation Customers	51	196
Potential New Tier 1 & 2 Irrigation Customers	43	95
Subtotal, with New Tier 1&2 Irrigation Customers	86	291
Pasatiempo Golf Course (secondary effluent)	1	107
Total Potential Irrigation Customers	87	398
Groundwater Replenishment	1	Remaining Recycled Water

The potential new Tier 1 and 2 recycled water customers could increase non-potable demands from the current 196 AFY up to approximately 291 AFY and are shown on Figure 7-2. However, based on recent trends with recycled water customers and demands, the SVWD has established a planning-level assumption that recycled water use within the SVWD service area may increase a total of 10-15% over the peak annual demands experienced in 2013 (the highest demand on record), in which the total demand was 217 AFY. Therefore, for planning the availability of effluent for recycled water in future years, the recycled water demand for irrigation in SVWD is estimated to eventually reach 240 AFY by 2035 as described in the 2015 Urban Water Management Plan.

The addition of the Pasatiempo Golf Course will increase demand for the secondary effluent by another 107 AFY based on the 2016 agreement between the City, SVWD, and Pasatiempo . This demand would be in the dry season for irrigation uses. Even with these new potential demands, this leaves a significant amount of unused recycled water in the spring, fall and winter seasons that could be used to replenish the SMGB.

7.5 Service Area

The service area based on the results of the market assessment is the SVWD water service area with the addition of the Hanson Quarry site.



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Recycled Water Facilities Planning Report
Future Potential Recycled Water Customers

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Figure 7-2

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Section 8. Groundwater Modeling and Hydro-Geological Assessment

The SMGBAC actively monitors the water levels and quality in the SMGB and has developed an in-depth hydro-geological MODFLOW model and database of the basin and it's different aquifers to help inform the management of the basin. As described earlier, the water agencies, municipalities and entities that are members of the SMGBAC include:

- SVWD
- SLVWD
- City
- County
- MHA

This section summarizes the results of groundwater modeling using the SMGB hydro-geological MODFLOW model and database, to evaluate the short-term and long-term effects and benefits of groundwater injection in the Lompico Aquifer in southern portion of the SMGB near the Hanson Quarry and in Scotts Valley at the El Pueblo site. This section also provides a hydro-geological assessment of travel and underground retention time of the injected water, as required by DDW, for evaluation and future permitting of injection of purified recycled water.

8.1 Potential Locations for Active Groundwater Replenishment

Active groundwater replenishment through injection of clean or purified water provides a direct means of adding water to an aquifer and raising groundwater levels, without relying on the variable natural recharge process. The Hanson Quarry property, located in the southern portion of the SMGB, has ceased operations as a quarry and regional stakeholders are discussing opportunities for the property to be transitioned for potential uses such as a regional park, limited housing development, and open space. The regional stakeholders have also identified the potential for groundwater replenishment facilities on a portion of the Hanson Quarry property. Following completion of the Hanson Quarry analysis, additional analysis was conducted for injection on properties owned by SVWD, which are described later in Section 8.3.

8.2 Recharge Potential in Hanson Quarry

The geology under the Hanson Quarry and the nearby surrounding areas is favorable for groundwater injection into the Lompico aquifer. The alluvial stratum that makes up the Lompico aquifer rises toward the ground surface in the area near the Hanson Quarry. While surface spreading of recycled water is a potential given the large area available at Hanson Quarry, the following factors make surface spreading less desirable:

- **Complex geology** – hinders the ability to maximize recharge of the Lompico aquifer from the surface.
- **Unknown surface conditions** – presents challenges to reliably estimate excavation quantities to strata that enable infiltration. Hanson Quarry reclamation activities and subsequent settling of sediments that occurred during quarry operations may have resulted in a clay-like layer of unknown thickness at the surface. This layer would likely require excavation and disposal to achieve a favorable infiltration rate for surface spreading. Drilling at the site would be required to confirm these conditions.

Given the unknowns with surface spreading; aquifer injection is the preferred method to achieve targeted recharge in the Lompico aquifer. The proposed injection wells in this area would need to be approximately 400-feet deep, as opposed to over 1,000 feet deep in other areas, to inject water through the depth of the Lompico aquifer.

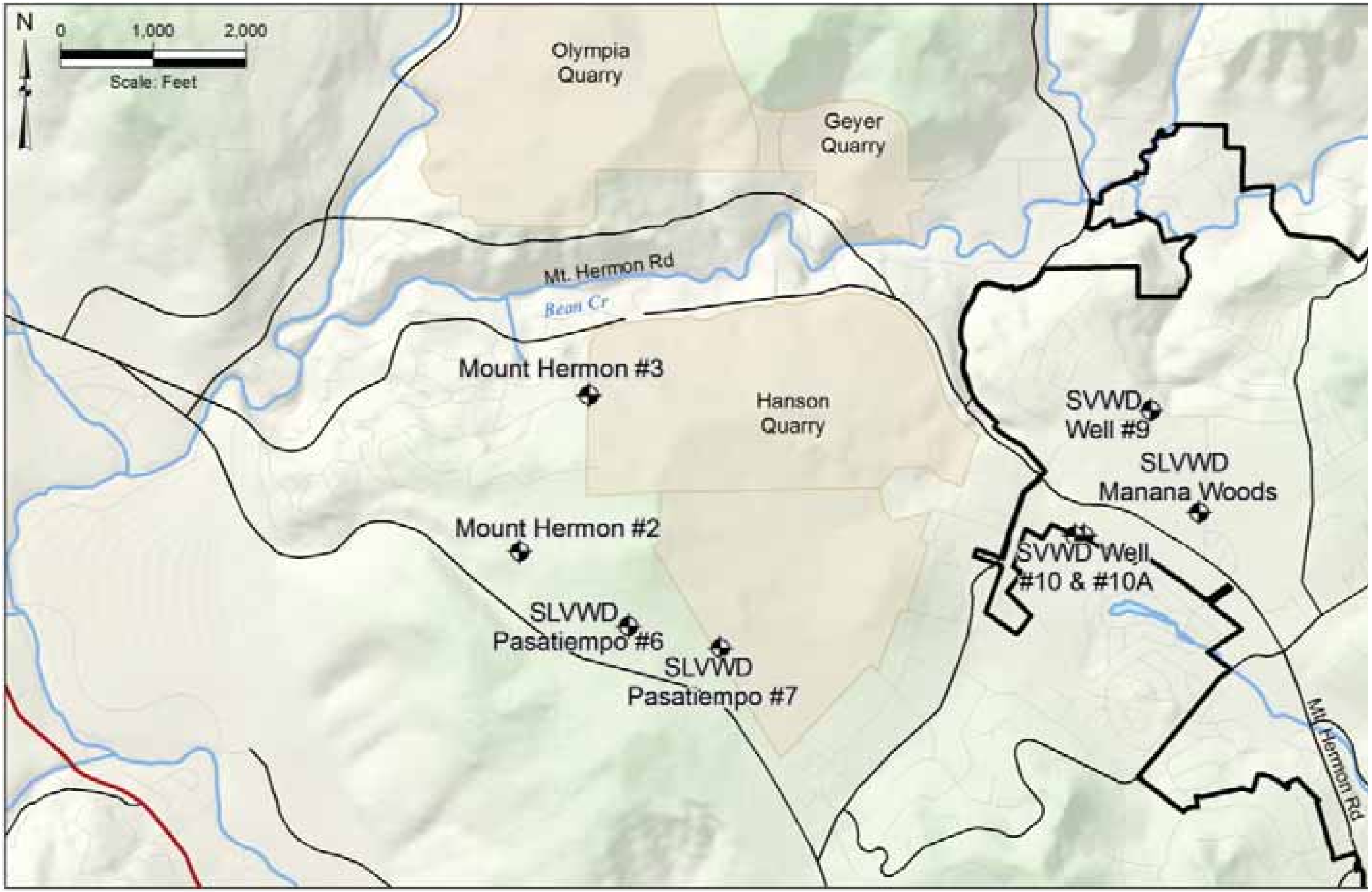
Lastly, the Lompico aquifer groundwater levels are relatively low in this area due to the groundwater withdrawal by nearby production wells from SVWD, SLVWD and Mt. Hermon Association. Figure 8-1 shows the Hanson Quarry property and nearby production wells.

8.3 Recharge Potential in Scotts Valley

An investigation of using public-owned parcels within Scotts Valley for aquifer injection. was conducted using Geographic Information System (GIS) data with input from the District. The following steps were performed:

1. Identify parcels of land that were publicly owned
2. Screen parcels that overlay the Lompico Aquifer which are likely to be favorable for injection
3. Select parcels for additional analysis
4. Confer with District staff on target areas

Figure 8-2 identifies parcels owned by the District, City, County, State and other entities in the vicinity of the identified Lompico injection area, which were considered as potential sites for an injection well. Based on discussions with the District, the El Pueblo site was identified as the most viable option because this site lies within the injection boundary areas, is owned by the District, and allows the use of existing wells 11A and 11B to be repurposed for injection in addition to siting new facilities.



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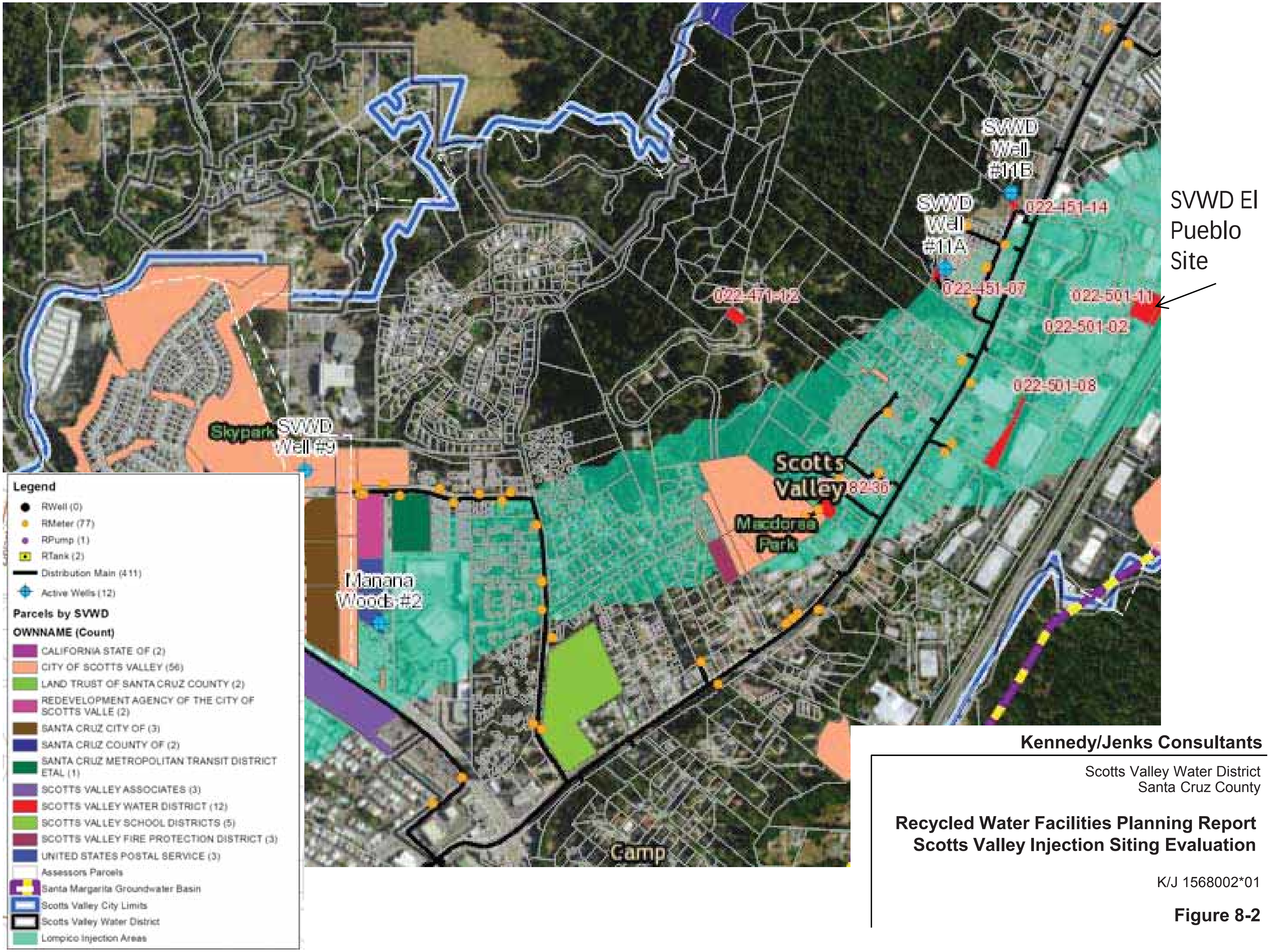
Recycled Water Facilities Planning Report
Hanson Quarry and Nearby Production Wells

K/J 1568002*01

Figure 8-1



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Santa Cruz County

Recycled Water Facilities Planning Report
Scotts Valley Injection Siting Evaluation

K/J 1568002*01

Figure 8-2

8.4 Infrastructure for Groundwater Injection

The infrastructure required for groundwater replenishment through injection includes:

1. A **local equalization tank** to receive the purified water from the treatment facility and provide equalization of inlet and outlet flows,
2. **several groundwater injection wells –** which are similar to groundwater production (extraction) wells in their construction, but often typically operate at about half the flowrate as a production well.
3. A **pump station** – to deliver purified water to the wells
4. **Interconnecting piping** - to move the purified water from the equalization tank to the injection wells, and
5. **Extraction wells** – to recover recharged groundwater. For this Project it is assumed that existing groundwater extraction wells would be sufficient and no new wells are included.

Based on the available recycled water from the WRF during winter and shoulder months, it is estimated that 460 to over 570 AFY of purified recycled water could be used to replenish the Lompico aquifer of the SMGB.

8.4.1 Hanson Quarry Injection Wells

The SMGB hydro-geological MODFLOW model assumed placement of three new injection wells in a well-field located on the Hanson Quarry, as shown in the Figure 8-3. However, due to the hydrogeologic characteristics of the aquifer, the results of the modeling would also be applicable for injection wells located at different properties/locations in the southern SMGB near Hanson Quarry and reaching down into the Lompico aquifer.

The three injection wells, each sized at about 250 gallon per minute (gpm) injection capacity, are shown as red dots in the middle of Figure 8-3. All three injection wells would be required to inject the full production from an APF during the wintertime when the most recycled water is available for replenishment. During other times of the year, operation of one or two wells would permit shutdowns for maintenance. The nearby SVWD, SLVWD and MHA production wells are shown as blue dots to the left and right of the Hanson Quarry property.

8.4.2 Scotts Valley El Pueblo Site Injection

For this site, the hydro-geological MODFLOW model assumed placement of one new injection well at the El Pueblo location in addition to repurposing SVWD Wells 11A and 11B for injection. As shown on Figure 8-4. Similar to the Hanson Quarry analysis, three 250 gpm capacity injection wells could inject the full APF production flow during the wintertime and could be alternated during the summer months for maintenance.

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Source: Groundwater Modeling
Todd Groundwater, 2015

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Proposed Injection Wells at Hanson Quarry

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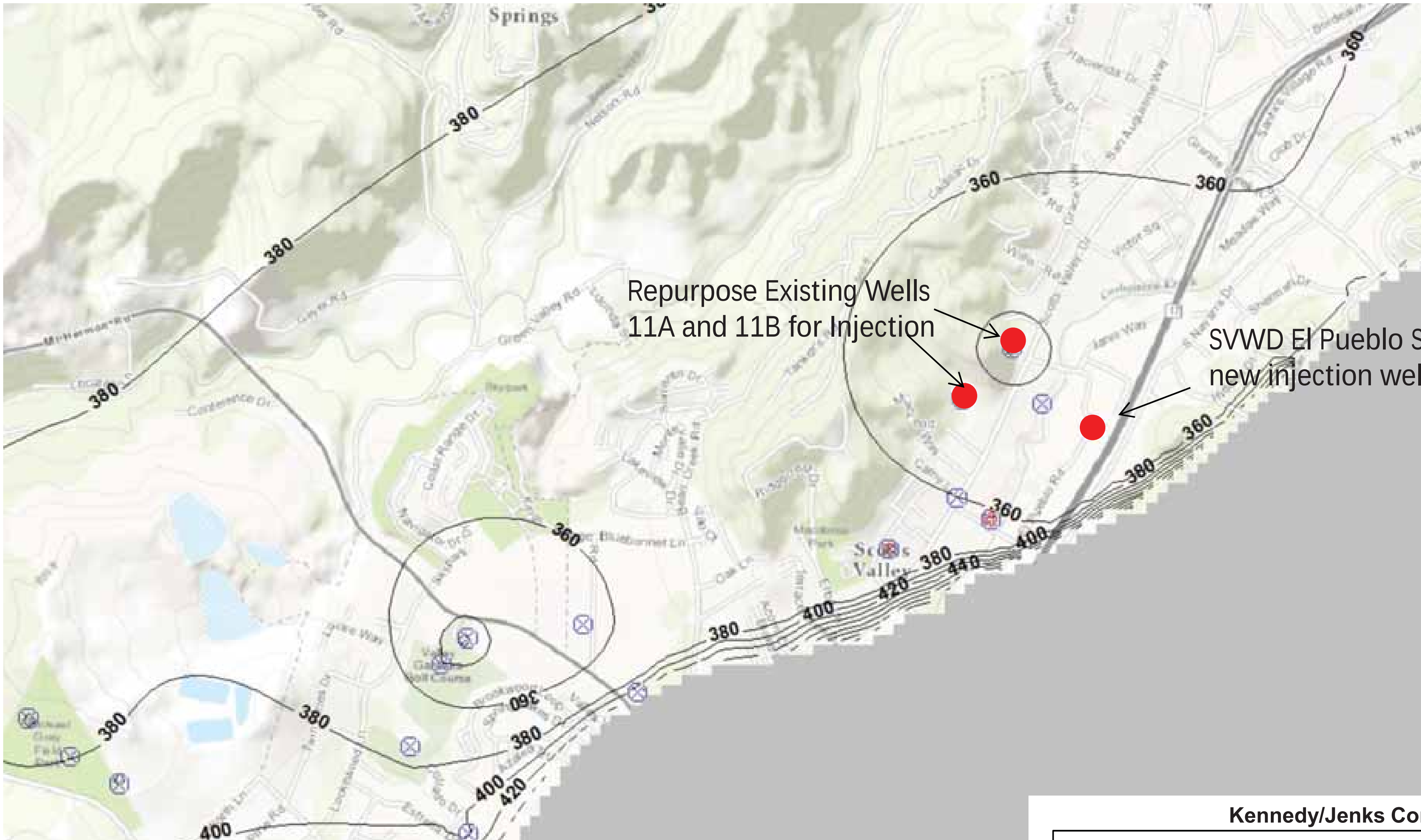
Figure 8-3



Source: Groundwater Modeling
Todd Groundwater, 2016

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Santa Cruz County

Recycled Water Facilities Planning Report
Proposed Injection Wells at Scotts Valley El Pueblo Site

K/J 1568002*01

Figure 8-4

8.5 Underground Retention Times for the Injected Water

The SMGB hydro-geological MODFLOW model was used to calculate the travel path and the underground retention time for a simulated molecule of purified water that is injected into the alluvial sands and materials of the groundwater aquifer. The injected water pushes out from the injection well into the aquifer over the full depth of the well screen (several hundred feet) and moves very slowly through the alluvial materials.

8.5.1 Hanson Quarry Retention Time

Figure 8-5 and Figure 8-6 show the approximate distances the purified injected water would travel in 6-months and 1-year of underground retention time, respectively. The underground residence time is shown as blue shaded area around each injection well.

The modeling shows that the underground retention time before the purified water reaches a production well, would be significantly greater than the minimum 2-months of retention time required by the DDW.

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Source: Groundwater Modeling
Todd Groundwater, 2015

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Recycled Water Facilities Planning Report
6-Month Underground Retention Time for Injection Wells at Hanson Quarry

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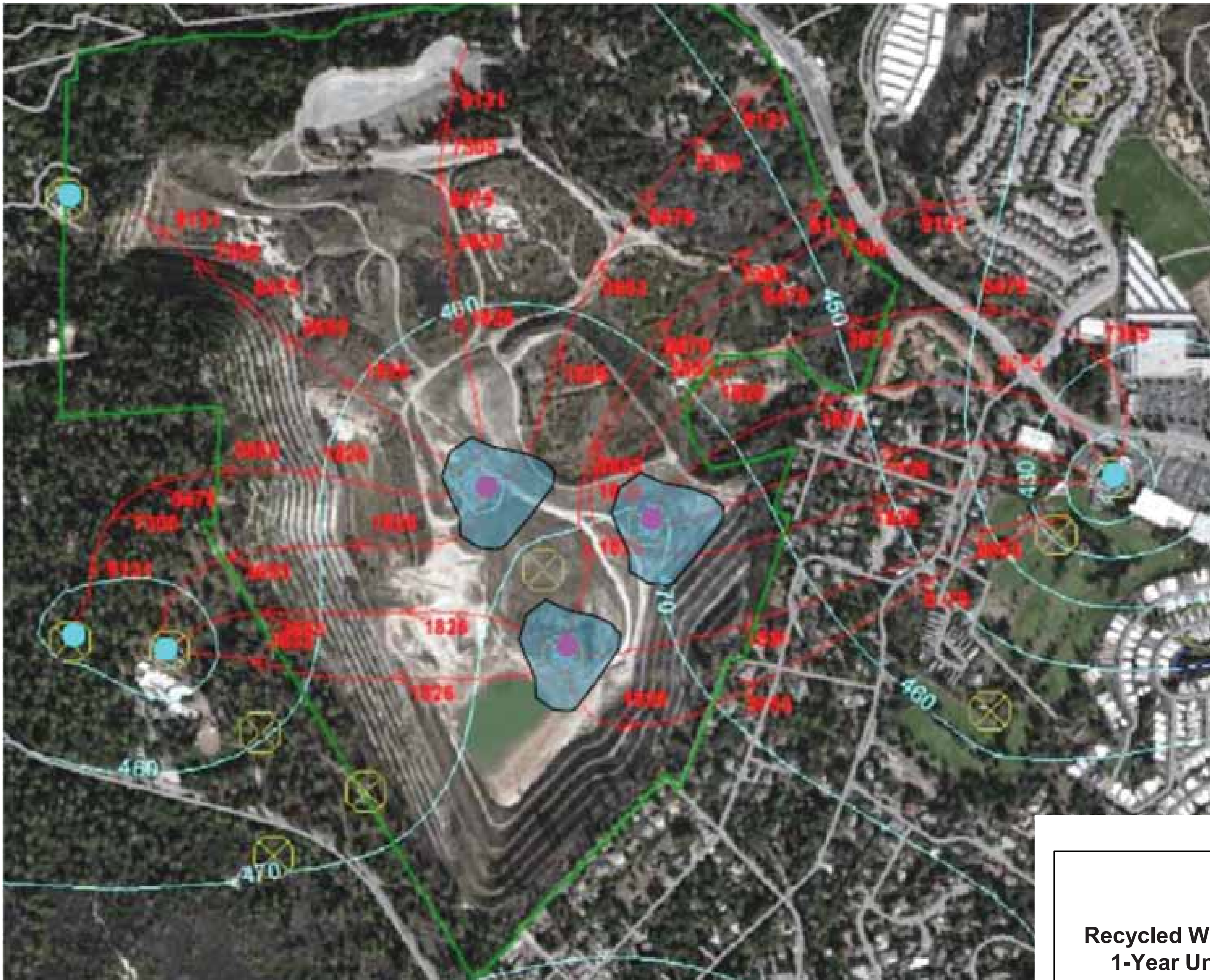
Figure 8-5



Source: Groundwater Modeling
Todd Groundwater, 2015

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Recycled Water Facilities Planning Report
1-Year Underground Retention Time for
Injection Wells at Hanson Quarry
K/J 1568002*01

Figure 8-6

8.5.2 Scotts Valley El Pueblo Site Retention Time

Figure 8-7 shows the approximate distances the purified injected water would travel in 5-years of underground retention time; this longer retention time was used as the shorter times were not readily visible[i]. The underground residence time is shown as blue shaded area around each injection well.

The modeling shows that the underground retention time before the purified water reaches the closest production well, either Well 3B or 9A, would be significantly greater than the minimum 2-months of retention time required by the DDW.

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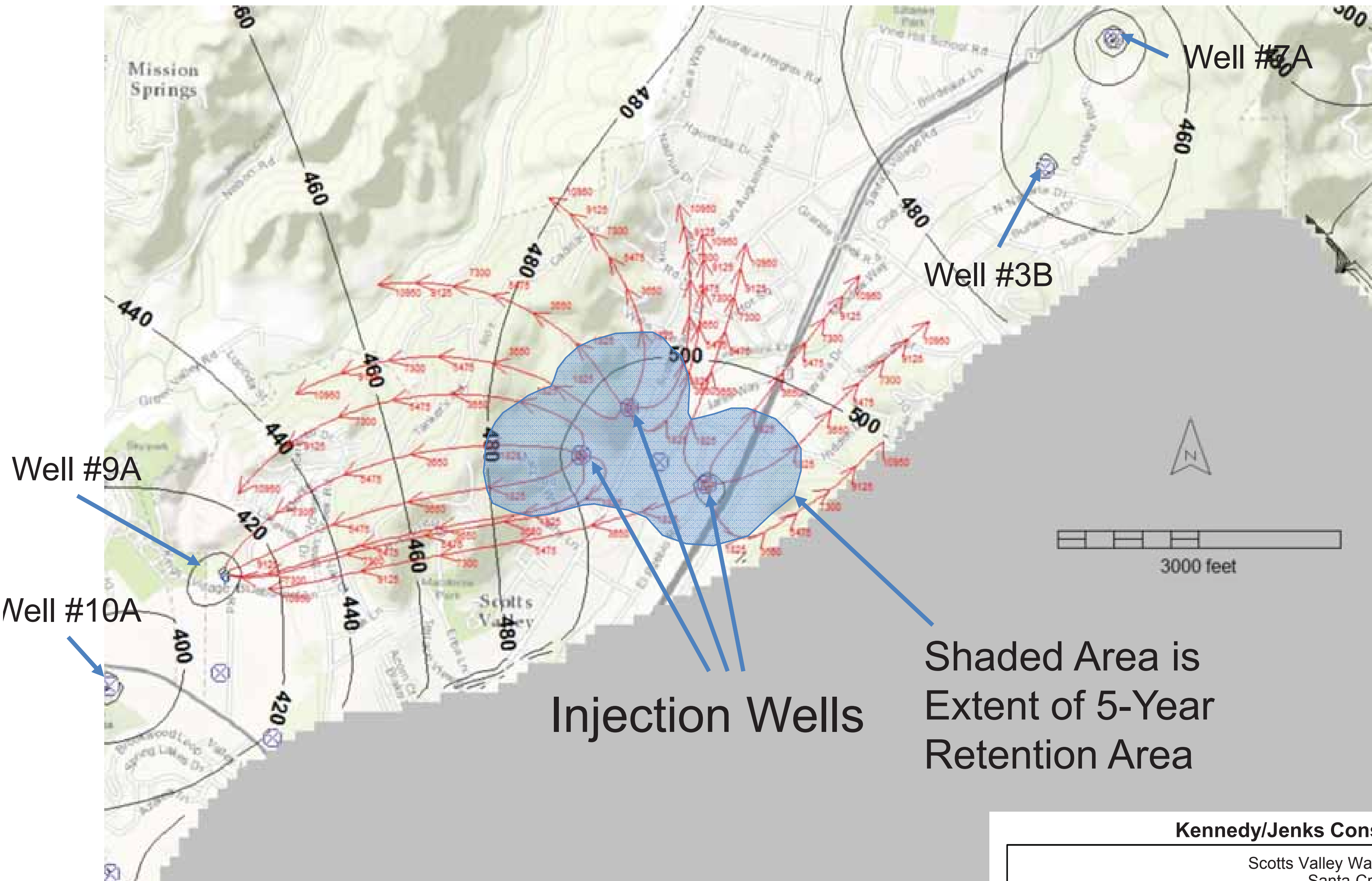

Source: Groundwater Modeling
Todd Groundwater, 2016

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Santa Cruz County

Recycled Water Facilities Planning Report
5-Year Retention Time for Injection Wells at Scotts Valley El Pueblo Site
K/J 1568002*01

Figure 8-7

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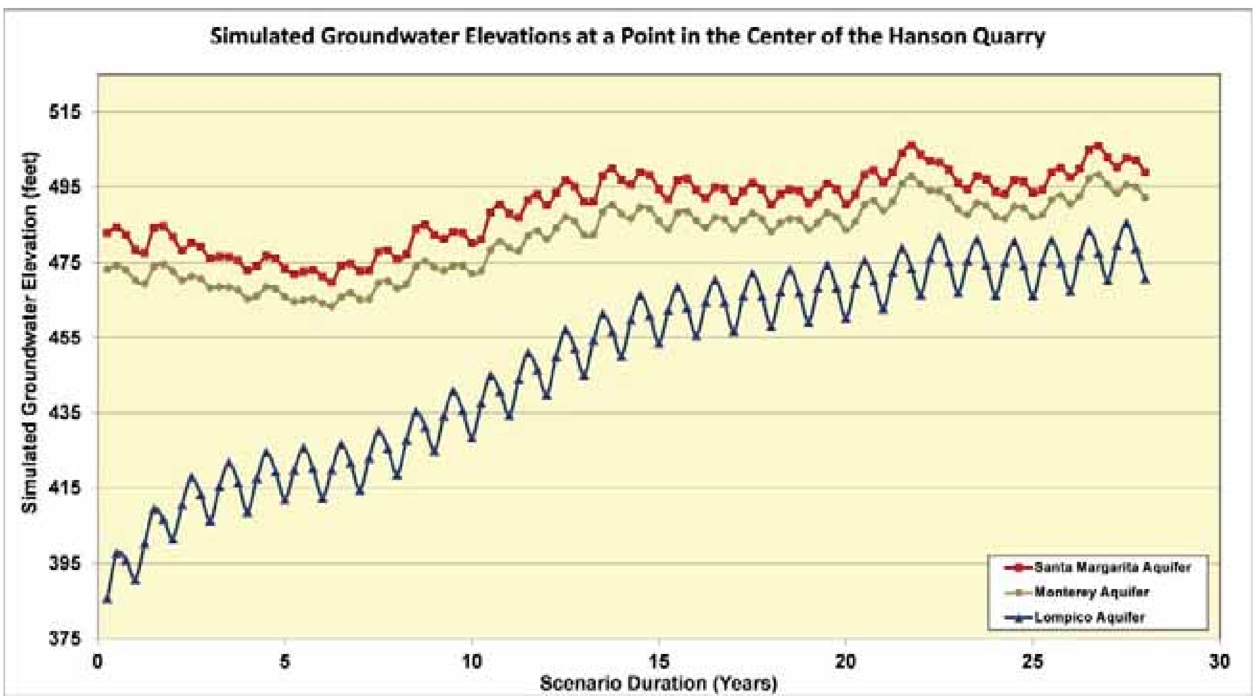
8.6 Long-Term Benefits to Groundwater Levels from Active Groundwater Replenishment

Similar to pushing a balloon into a bathtub that causes water levels in the whole bathtub to rise, the injected purified water creates a "water bubble" (e.g. the balloon) around the injection well, that causes water levels to rise throughout the Lompico aquifer. It follows that the benefit of injecting purified water in the southern portion of the SMGB, whether at Hanson Quarry or in Scotts Valley El Pueblo Site, will result in increased groundwater levels in the Lompico aquifer throughout the entire basin.

8.6.1 Hanson Quarry Injection Groundwater Modeling Results

Figure 8-8 and Figure 8-9 illustrate the model results of active injection of approximately 560 AFY into the SMGB Lompico Aquifer. Figure 8-8 shows that groundwater levels could be raised approximately 65 to 70 feet over 15 to 20 years. This would reduce the groundwater pumping energy requirements for all groundwater users in the area.

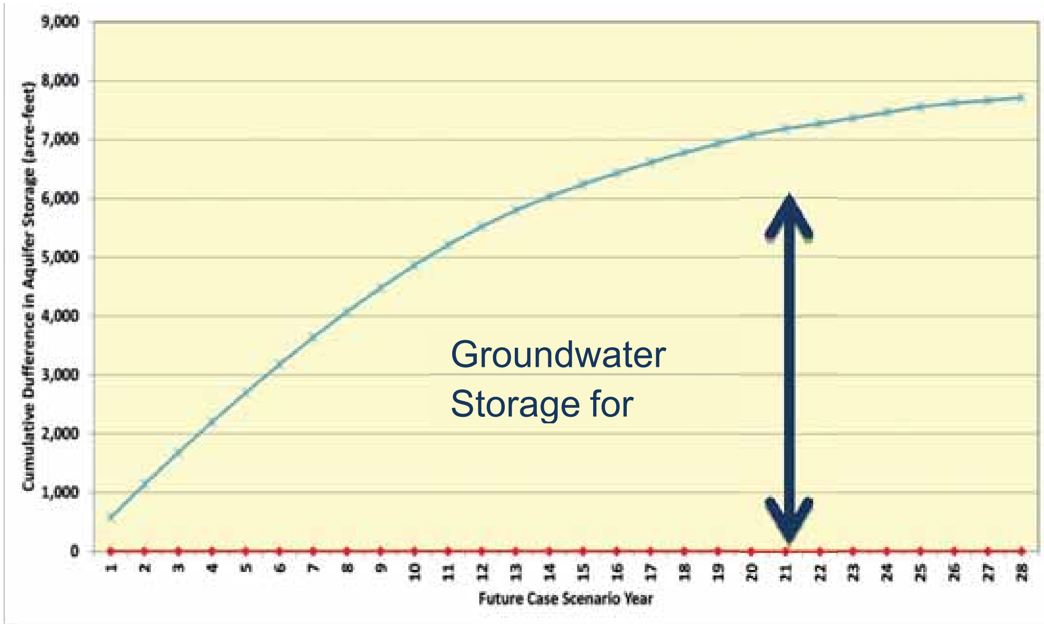
Figure 8-8: Lompico Aquifer Levels with Active GW Replenishment at Hanson Quarry*



*Source: Groundwater Modeling Todd Groundwater, 2015

Raising the groundwater levels could also provide approximately 6,000 AF of water storage, over the 28-year period, that could be tapped during droughts when surface water supplies are limited. Figure 8-9 shows cumulative additional aquifer storage over time with active groundwater injection.

Figure 8-9: Groundwater Storage for Droughts with Injection at Hanson Quarry*



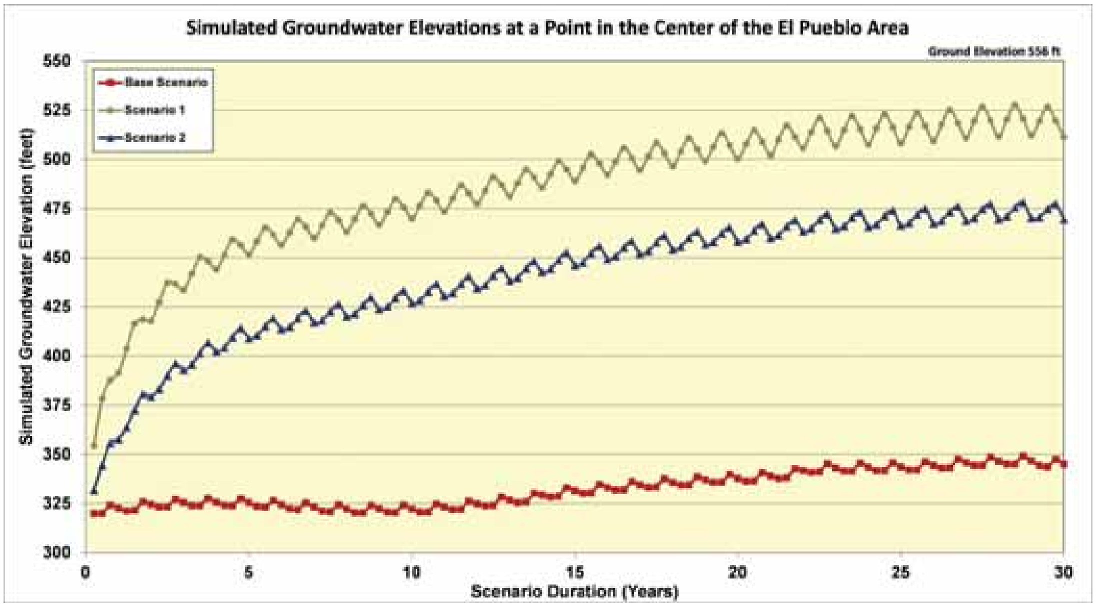
*Source: Groundwater Modeling Todd Groundwater, 2015

In later years of active replenishment, the cumulative groundwater storage starts to plateau. This is because as groundwater levels rise, the groundwater starts to interact with the local creeks and springs and a portion of the injected water helps to increase the baseline flows in Bean and Carbonero Creeks. These increased surface water flows benefit the agencies with surface water rights, and benefits the environment, riparian habitats and downstream endangered species.

8.6.2 Scotts Valley El Pueblo Site Injection Groundwater Modeling Results

Figure 8-8 and Figure 8-9 illustrate the model results of active injection of approximately 560 AFY into the SMGB Lompico Aquifer at Hanson Quarry. Figure 8-10 Scenario 1, which simulates injection at Wells 11A, 11B, and at the new El Pueblo well, shows that groundwater levels could be raised approximately 150 to 190 feet over 15 to 20 years. Scenario 2 was for a different injection well layout that was less favorable. This water level rise would reduce the groundwater pumping energy requirements for all groundwater users in the area.

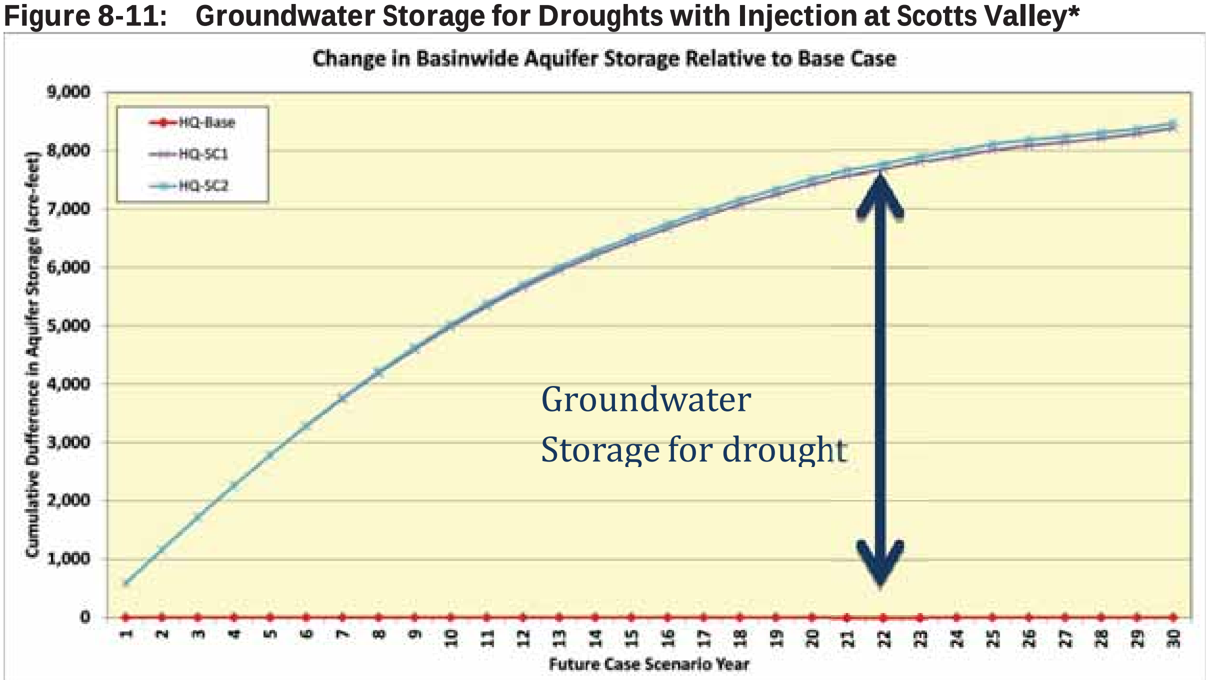
Figure 8-10: Lompico Aquifer Levels with Active GW Replenishment at Scotts Valley*



*Source: Groundwater Modeling Todd Groundwater, 2016

As with the Hanson Quarry modeling, raising the groundwater levels could also provide approximately 6,000 AF of water storage, over the modeled period, that could be tapped during droughts when surface water supplies are limited. Figure 8-11 shows cumulative additional aquifer storage over time with active groundwater injection at Scotts Valley El Pueblo Site.

Figure 8-11: Groundwater Storage for Droughts with Injection at Scotts Valley*



*Source: Groundwater Modeling Todd Groundwater, 2016

Base flow benefits similar to the Hanson Quarry scenario accrue with injection at Scotts Valley.

8.7 Summary of Groundwater Modeling Results

The geology under the Hanson Quarry and the nearby surrounding areas including Scotts Valley is favorable for groundwater injection into the Lompico aquifer. The three injection wells, each sized at about 250 gpm injection capacity area capable of recharging up to 560 AFY of purified recycled water into the Lompico aquifer of the SMGB. The GRRP regulatory requirements for greater than 2 months underground retention time between the point of injection and extraction can easily met at all sites evaluated.

The overall benefits of active groundwater replenishment in the SMGB include:

- Storage of approximately 6,000 AF of water for drought supply.
- Reduced pumping energy requirements for groundwater users.
- Increased surface water flows in local creeks provides more water for surface withdrawal.
- Increased surface water flows in local creeks provides improved conditions for wildlife habitat, cold fresh water habitat, fish migration, fish spawning, preservation of biological habitats of special significance, commercial and sport fishing, and rare, threatened, or endangered species.

The benefits of active groundwater replenishment are regional and apply to the members of the SMGBAC, the general community, regional stakeholders and environmental regulatory agencies.

Section 9. Potential Recycled Water Supply and Other Water Supply Alternatives

The purpose of this section is to present potential recycled water supply alternatives for summer irrigation and groundwater replenishment in the SMGB, which occurs mostly in the winter and shoulder months. Other alternatives as required in the SWRCB Guidelines are also presented.

9.1 Recycled Water Supply Scenarios

9.1.1 Volume Available for Groundwater Replenishment

The volume available for recycled water and groundwater replenishment is dependent on the influent flows at the Scotts Valley WRF and recycled water demands for existing customers. Table 9-1 summarizes the estimated volumes of water available for groundwater replenishment assuming the estimated increase in recycled water demand occurs for additional Tier 1 and Tier 2 customers described in Section 7.

Table 9-1: Estimated Volume Available for Groundwater Replenishment

Year	Estimated Ave Wastewater Flow, AFY	Estimated RW Demands with Existing and Future Customers, AFY(a)	Estimated Available Non-Recycled Wastewater, AFY(b)	Estimated Advanced Purified Water for GWR, AFY(c)
2015	874	200	674	546
2020	892	210	682	553
2025	911	220	691	559
2030	929	230	699	566
2035	947	240	707	573

(a) From 2015 Urban Water Management Plan, Pasatiempo GC demand of 107 AFY is not included

(b) Pasatiempo GC demand of 107 AFY is not included

(c) Supply Available is estimated to be 80% of the Annual Available Flow, based on an 80% efficiency through treatment processes. Estimated APW with 107 AFY of Pasatiempo GC needs met is in Table 9-2.

Based on estimated wastewater flows to the Scotts Valley WRF, and estimated increased recycled water demands with the SVWD service area, it is estimated that up to 700 AFY of effluent is available for additional treatment for the GWR Project. The APF treatment process, described in Section 6, would generate a waste stream that would be discharged to the existing ocean outfall. Assuming an 80-percent recovery of the advanced purification processes, up to 560 AFY without meeting Pasatiempo GC demands could be injected into the Lompico aquifer for active groundwater replenishment. Table 9-2 provides estimate with Pasatiempo GC demands.

9.1.2 Volume Available for Groundwater Replenishment with Secondary Effluent to Pasatiempo Golf Course

Table 9-2 illustrates how the availability of supply for groundwater replenishment changes with the addition of Pasatiempo Golf Course as a customer of secondary effluent. Pasatiempo recently entered into agreement with the City of Scotts Valley to receive up to 35 million gallons/year or 107 AFY of secondary effluent at an average rate of up to 170,000 gpd/ 118 gpm. At the maximum rate of 170,000 gpd, 205 days of diversion would be required to divert the maximum 35 million gallons. Table 9-2 reflects the lower diversion rate in the agreement. Table 9-3 shows how the recycled water supply is anticipated to vary with seasonal variations and has not altered the available wet season flows because the daily Pasatiempo demands are not expected to differ significantly in the dry season and will have no impact on the wet season.

Table 9-2: Estimated Volume Available Groundwater Replenishment with RW Service to Pasatiempo Golf Course

Year	Estimated Average Wastewater Flow (AFY)	Estimated Future RW and Pasatiempo GC Demands [a], (AFY)	Estimated Available Non-Recycled Wastewater after Meeting Pasatiempo GC Demands (AFY)	Estimated Advanced Purified Water for GWR[b] (AFY)
2015	874	200	674	546
2020	892	317	575	466
2025	911	327	584	473
2030	929	337	592	479
2035	947	347	600	486

(a) Delivery of secondary effluent to Pasatiempo Golf Course is assumed at 107 AFY after 2015.
(b) Supply Available is estimated to be 80% of the Annual Available Flow, based on an 80% efficiency through treatment processes; 475 AFY of APW is used for economic calculations in Table 10-4.

Once Pasatiempo Golf Course is meeting its non-potable demands with recycled water from the secondary effluent, it is estimated that up to 486 AFY could be injected into the Lompico aquifer for active groundwater replenishment over the next 20 years.

9.1.3 Planning and Design Assumptions

9.1.3.1 Peak delivery criteria

Serving Pasatiempo Golf Course with secondary effluent, in addition to SVWD irrigation demands, limits recycled water availability in the peak demand summer period, while allowing for groundwater replenishment in the lower demand periods. Table 9-3 shows the availability of excess recycled water for replenishment at peak and average recycled water demands, as well as in the wet season. Although there is limited excess recycled water available after meeting peak day demands in the summer, peak day conditions are limited in duration and therefore, there is opportunity for replenishment even in the summer once peak RW demands are met. The flows presented confirm that a 1 MGD APF size is appropriate to treat as much available peak wet weather flow as possible.

Table 9-3: Scotts Valley WRF Estimated Seasonally Available Flow for Purification with Pasatiempo GC

	Dry Season		Wet Season	
Year	Available Flow Remaining After Meeting Peak Day RW Demand MGD(a)	Available Flow Remaining After Meeting Average Day RW Demands MGD(b)	Available Flow During Average Wet Weather Flow Conditions MGD(c)	Available Flow During Peak Month Wet Weather Flow Conditions, MGD(d)
2015	0.33	0.53	0.80	0.88
2020	0.05	0.36	0.78	0.86
2025	0.00	0.33	0.79	0.87
2030	0.00	0.35	0.81	0.89
2035	0.02	0.36	0.83	0.91

(a) Based on Ave Flow, Table 3-2 and peak day recycled water demands including Pasatiempo Golf Course secondary effluent and expanded SVWD recycled water demands.
(b) Based on Ave Flow, Table 3-2 and average day recycled water demands including Pasatiempo Golf Course secondary effluent and expanded SVWD recycled water demands.
(c) Ave Wet Weather Flow is based on average effluent flow for November - March from 2012-2014
(d) Peak Month Wet Weather Flow based on month with historically highest effluent flow from 2012-2014
(e) Annual Available Flow is estimated by assuming Ave Day RW Demand Conditions during irrigation season (213 days per year) and Ave Wet Weather Conditions during non-irrigation season (151 days per year).

Other planning and design assumptions include:

9.1.3.2 Delivery and system pressure criteria

The delivery and system pressure criteria of about 70 psi is currently applied for the existing tertiary recycled water system which is necessary for irrigation. This pressure should be sufficient for delivery of tertiary recycled water to the APF.

9.1.3.3 Storage criteria

There is currently 600,000 gallons of tertiary recycled water storage. Additional storage will be required at the APF facility for equalizing flows to the membranes on the order of 250,000 gallons as well as possible concentrate storage of at least 50,000 gallons. Storage volumes will be verified during design.

9.1.3.4 Cost Assumptions

The following cost assumptions have been used in Section 10 cost estimates including a discount rate of 2 percent cost and a useful life and planning period of 30 years for calculation of annualized costs. An 8 percent escalation to the mid-point of construction cost, to occur in 3 years, is included which is consistent with the more conservative Engineering News Record increases in the San Francisco Construction Cost Index.

9.2 Water Recycling Alternatives Evaluated

9.2.1 Overview of Alternatives Development

Since the previous 2009 FPR focused on alternatives for delivery of non-potable recycled water for irrigation, the alternatives considered in this SMGB Regional Groundwater Replenishment Program FPR focus on purified recycled water for groundwater replenishment. The approach herein maximizes the use of recycled water by optimizing irrigation reuse in the summer and groundwater replenishment in the winter when irrigation demand is low. To this end, all recycled water alternatives include current and some future irrigation. Even with potential future Pasatiempo irrigation demands, about 460-490 AFY or more of purified water could be available for groundwater replenishment.

Non-recycled water, water conservation, and no project alternatives are also discussed in this section.

9.2.1.1 State Planning Priorities

The applicable State Planning Priorities contained in California Government Code Section 65041.1 to this recycled water project include priorities that:

> "…promote equity, strengthen the economy, protect the environment, and promote public health and safety in the state…
>
> (a)…improve[e] existing infrastructure that supports infill development and appropriate reuse and redevelopment of previously developed, underutilized lands…
>
> (b) to project environmental… resources by … enhancing the state's most valuable natural resources including…,natural lands such as…watershed…
>
> (c) to encourage efficient development …(4) is served by adequate…essential utilities.",

SVWD's recycled water and APF alternatives strengthen the economy and promote public health and safety by providing alternative water supplies. Recycled water in SVWD is delivered along existing infrastructure to infill development and redevelopment lands which encourages efficient development. Implementation of APF and groundwater replenishment enhances the watershed by raising groundwater levels that will increase base flows in the water ways.

9.2.1.2 Sustainable Water Resource Management Priorities

The alternatives developed are in alignment with SWRCB Resolution No. 2008-0030 which requires Sustainable Water Resources Management and acknowledges that sustainable water resources management is vital to California's future. Tertiary recycled water is among the most sustainable water resources as it reuses wastewater as opposed to allowing the wastewater to be discharged to the ocean and provides a drought resistant source. Alternatives that include APF provides additional treatment to the highest levels that further allow use for not only irrigation but also for potable purposes which provides even a further hedge on climate change impacts to traditional water supplies. The Resolution further directs State Water Board staff to assign a higher grant priority to climate related projects that are supported by local policies and ordinance.

9.2.2 Alternative Markets

As described in Section 7, the alternative markets evaluation included the following:

- Non-potable reuse (irrigation)
  - Tier 1 – Infill Customers within SVWD
  - Tier 2 – Minor Extensions within SVWD
  - Tier 3 – New infrastructure within SVWD
  - Tier 4 – Santa Cruz Customers including Pasatiempo Golf Course
- Groundwater Replenishment
  - South Hanson Quarry
  - North Hanson Quarry
  - Camp Evers area
  - South Scotts Valley area
  - North Scotts Valley Area

Surface water augmentation was not included in the market analysis as the nearest existing reservoir is Loch Lomond which is over ten miles away and the regulatory requirements and viability of this option are uncertain at this time.

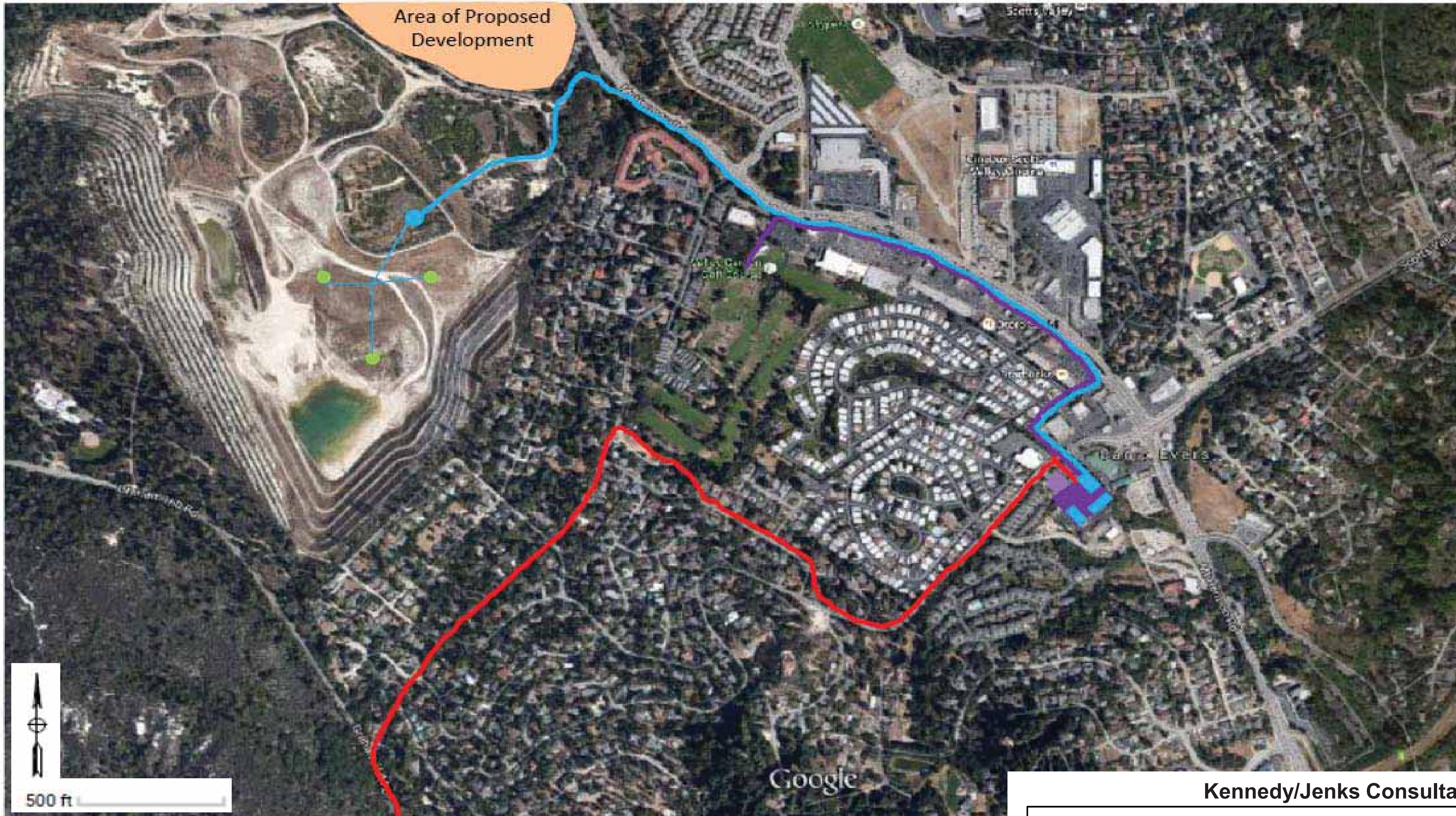
For the purposes of this alternatives evaluation, the non-potable market focuses on Tiers 1 and 2, while meeting Pasatiempo secondary effluent delivery and injection of purified water at the South into the SMGB for groundwater replenishment.

9.2.3 Treatment Alternatives

For the purposes of non-potable reuse, the existing Scotts Valley WRF has adequate treatment capacity to meet existing and planned Tier 1 & 2 demands, so no additional treatment alternatives are considered. For groundwater replenishment by subsurface injection, advanced purification is needed to meet regulatory requirements. The specific APF treatment technologies and site layouts are discussed in greater detail in Section 6. For the purposes of this evaluation, the treatment and pipeline alternatives include the following siting options, shown on Figure 9-1,Figure 9-2, and Figure 9-3 respectively:

- APF located at the existing Scotts Valley WRF
- APF located at Hanson Quarry
- APF located at District El Pueblo Site

The use of stormwater and/or diverted surface water from the San Lorenzo River as possible sources of recharge water are discussed in the 2011 Conjunctive Use Study. These other water sources would require treatment to remove suspended solids and other possible constituents prior to injection. This treatment alternative is not considered further as these sources of supply were screened from further consideration as discussed below.



APF	Existing 8" RW Pipeline
SV WRF	Existing Effluent Discharge Pipeline *
GW Recharge Well	Proposed 8" Purified Water Pipeline - Option 1
Purified Water Storage	* Concentrate from APF to go to existing Effluent Discharge
RW Equalization Tank	

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Recycled Water Facilities Planning Report
APF at Scotts Valley

K/J 1568002*01

Figure 9-1

APF
SV WRF
GW Recharge Well
Purified Water Storage
RW Equalization Tank

Existing 8" RW Pipeline
Existing Effluent Discharge Pipeline
Proposed 8" RW Extension Water Pipeline
RW Pipeline Alternative (Replacement) - Option 2
Proposed 6" Concentrate Pipeline - Option 1
Concentrate Pipeline Alternative - Option 2

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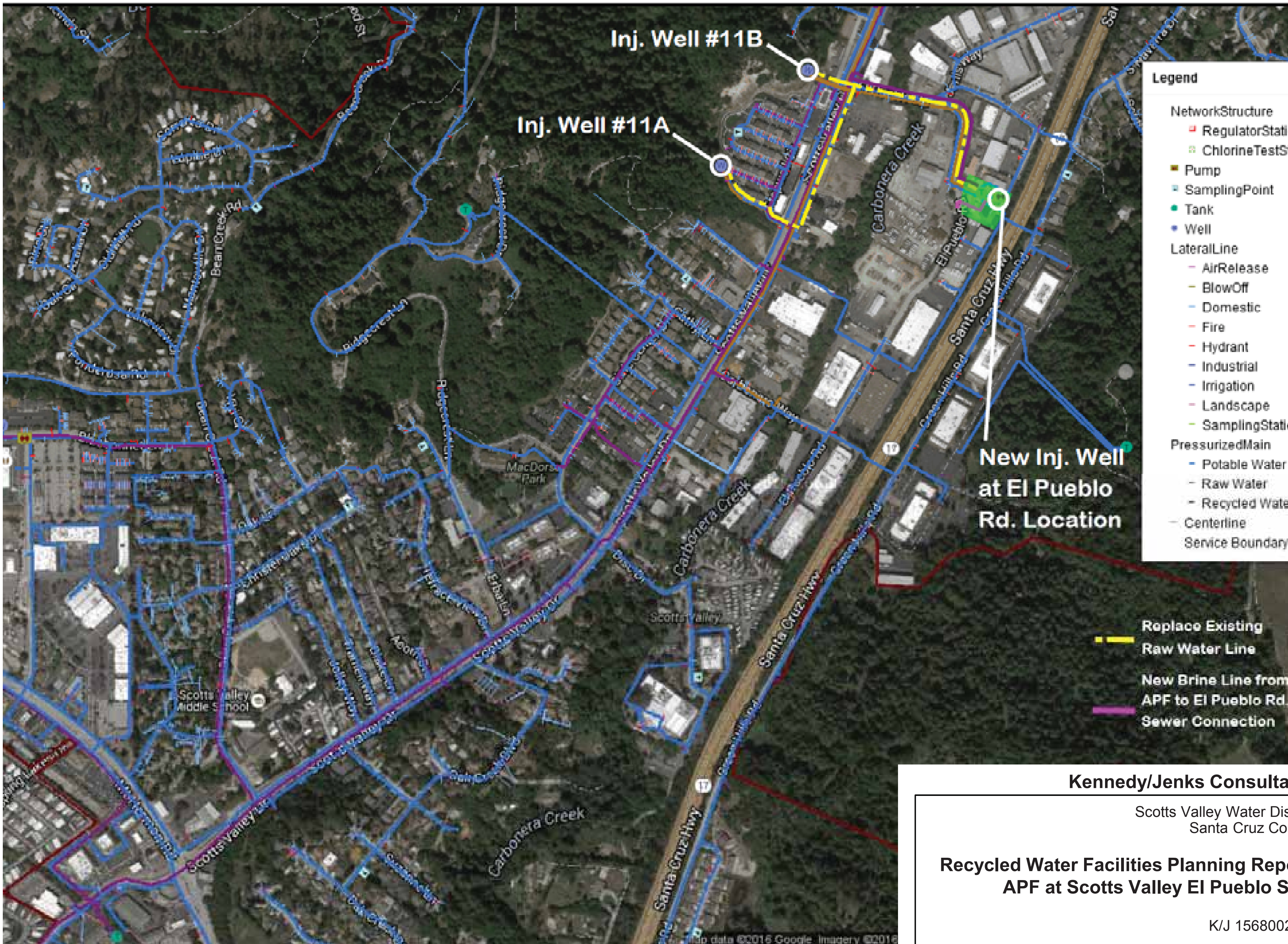
Recycled Water Facilities Planning Report
APF at Hanson Quarry

K/J 1568002*01

Figure 9-2



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Recycled Water Facilities Planning Report
APF at Scotts Valley El Pueblo Site

K/J 1568002*01

Figure 9-3

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9.2.4 Pipeline Route Alternatives to Hanson Quarry

For the project alternatives involving the APF located at Hanson Quarry, pipelines would be required to deliver tertiary water to Hanson Quarry and to convey concentrate for disposal; several pipeline route alternatives were evaluated as described below.

9.2.4.1 Tertiary recycled water pipeline alternatives

The source water for the APF is tertiary recycled water produced at the Scotts Valley WRF. A pipeline would be constructed to deliver tertiary recycled water from the Scotts Valley WRF to the APF at Hanson Quarry.

There is currently a recycled water pipeline extending from the SV WRF along Mt. Hermon Rd. and terminating at the Valley Garden Golf Course location near the intersection of Mt. Hermon Rd. and Lockwood Ln. The existing recycled water pipeline is polyvinyl chloride (PVC) pipe of unknown provenance. The District currently operates this pipeline at < 70 psi to prevent issues.

- **Option 1** would extend the existing 8-inch tertiary recycled water pipeline from its current termination point at the Valley Golf Course. The extension would parallel Locke Way until this roadway terminates near the eastern edge of the Hanson Quarry property. The pipeline route would then follow along Quarry Rd. until reaching the APF location. This alternative would require approximately 2,600 linear-feet of 10 inch-diameter pipe.
- **Option 2** would include a new tertiary recycled water pipeline extending from the SV WRF to the APF location in Hanson Quarry. The pipeline route would parallel Mt.Hermon Rd. to its intersection with Quarry Rd. The pipeline then parallels Quarry Rd. to the location of the APF. This alternative would require approximately 6,900 linear-feet of 10 inch-diameter pipe.

These two pipeline options are shown on Figure 9-1 and Figure 9-2 respectively.

9.2.4.2 Concentrate disposal pipeline alternatives

The reverse osmosis membranes in the proposed APF treatment train generate a waste-stream containing the salts that have been rejected by the membranes. This waste-stream of concentrated salts would have a total dissolved solids (TDS) concentration of approximately 4,000 mg/l and requires disposal. There is an existing disinfected secondary effluent pipeline that conveys effluent pumped from the Scott Valley WRF Santa Cruz for discharge to the Pacific Ocean via the existing ocean outfall pipeline for the City of Santa Cruz Wastewater Treatment Facility, which could be used to dispose of the concentrates. However, this same ocean outfall pipeline will be used to convey secondary effluent to Pasatiempo during the summer months, therefore additional evaluation will need to be conducted for seasonal concentrate management.

The existing outfall for the Scotts Valley WRF travels along Whispering Pines Dr. Estrella Dr, Lockwood Ln and Graham Hill Rd. before traveling further towards Santa Cruz as shown on Figure 9-2.

There are two proposed concentrate pipeline route alternatives shown on Figure 9-2 as described below:

- **Option 1** would extend from the APF at Hanson Quarry, traveling to the southern tip of Hanson Quarry where the alignment would follow Graham Hill Rd to an intertie with the existing outfall at the intersection of Graham Hill Rd and Lockwood Ln. This alternative would require approximately 5,300 linear feet of 6 inch diameter pipe.
- **Option 2** would extend from the APF at Hanson Quarry, travelling along Quarry Rd. to Locke Way and then Estrella Dr. where it would intertie with the existing outfall at the intersection of Estrella Dr. and Lockwood Ln. This alternative would require approximately 3,500 linear feet of 6 inch diameter pipe.

9.2.5 Storage Alternatives

No additional storage is anticipated for the non-potable reuse system. To increase the reliability of operation and increase production at the Scotts Valley WRF, additional storage of about 250,000 gallons would benefit the APF by providing a constant flow of recycled water for treatment. Due to space limitations, a steel tank for storage of tertiary recycled water is assumed to be located at or near the Scotts Valley WRF below the adjacent Hocus Pocus Park or under APF facilities at the WRF.

9.2.6 Groundwater Replenishment Alternatives

As described in Section 8.1, there are two methods for groundwater replenishment – recharge via injection wells and recharge via surface spreading. The geology under the Hanson Quarry and the surrounding areas is favorable for groundwater replenishment via injection wells into the Lompico aquifer. While groundwater replenishment via surface spreading is a potential given the large area available at Hanson Quarry, there may be clay-like layers of unknown thickness that could require excavation and disposal to enable recharge via surface spreading at the quarry, which makes surface recharge of the Lompico aquifer less desirable. Therefore, surface recharge was eliminated from further consideration as a groundwater replenishment method.

9.3 Non Recycled Water Alternatives (Other Potentially Viable New Sources of Water)

Based on current conditions, groundwater levels have stabilized following many years of decline. Groundwater resources may be insufficient, especially during drought, to reliably sustain current and future water uses in SVWD without further increasing groundwater levels by actively or passively recharging the SMGB.

The SVWD does not hold any surface water rights, thus, there are a limited number and type of additional water supplies available to the SVWD. SVWD already delivers recycled water for irrigation which is a drought-proof supply. The options open to SVWD for non-recycled water include exchanges with the City of Santa Cruz which would allow for in-lieu (passive) recharge of the groundwater basin or stormwater or surface water diversions for active recharge; both of which are discussed in the following sections.

9.3.1 City of Santa Cruz Interconnection for potable exchange

An interconnection between the SVWD and the City of Santa Cruz would be mutually beneficial. The interconnection would allow for the SVWD to receive potable water in the winter from the City of Santa Cruz in exchange for potable water provided to Santa Cruz in the summer, especially during droughts or in emergencies OR to balance the secondary effluent delivered to Pasatiempo, a Santa Cruz potable water customer, in the summer.

The potable water exchange would provide SVWD with access to a range of water sources that the City of Santa Cruz has available, such as surface water, groundwater, or potentially desalination water in the future. The exchange would typically occur during the winter periods, but could also be transferred during emergency situations if needed.

A potable-recycled water exchange would support the Integrated Regional Water Management Plan efforts that the City of Santa Cruz and the District is participating in. By providing recycled water in lieu of potable water, the City of Santa Cruz would be able to preserve its previous potable resources in the summer when demands are the highest. Taking the initiative to inter-tie the region would demonstrate City of Santa Cruz's commitment to the development of a sustainable water portfolio and support their efforts to investigate desalination as another component to this portfolio.

The interconnection could be achieved by completing an inter-tie between SVWD and Santa Cruz, which was designed at a preliminary level in another project as a part of a series of interties between SVWD, SLVWD and Santa Cruz. The emergency intertie pipelines between SVWD and SLVWD as well as within SLVWD north and south service areas will be in place by 2016. The proposed intertie between Santa Cruz and SVWD was along La Madrona Road and estimated to cost $2.665 m (2012) – escalate to 2015. This project was not constructed with the other interties because of a reduction of available grant funding; however, interest has recently renewed in this project from the Santa Cruz Water Advisory Commission.

9.3.2 Stormwater and Surface Water Diversion

The Phase 1 Conjunctive Use and Enhanced Aquifer Recharge Project (Conjunctive Use Study) completed in 2011, identified a range of potential water sources including surface water, storm-water, surplus recycled water and other potential water supplies that were evaluated as a possible source for groundwater recharge where feasible. The Conjunctive Use Study evaluated a wide variety of approaches to off-stream diversion of water to optimize utilization of flows to off-stream groundwater recharge ponds, in a manner that satisfies aquatic habitat preservation requirements while fulfilling operational objectives. The Conjunctive Use Study identified 3 preferred alternatives to be pursued to enhance recharge including Low Impact Development, Inter-District Exchange for in-lieu recharge (achieved by construction of the intertie projects discussed in Section 9.3.1, and Surface Water from Felton Diversion for recharge in Hanson Quarry. The Conjunctive Use Study acknowledged the significant challenges with surface water diversions namely water rights modifications that can take tens of years to complete. Since 2011, regulations for potable reuse in groundwater have been approved making potable reuse a more favorable alternative over surface water diversions and recharge.

In addition, a more focused technical memorandum in 2015 evaluated the facilities necessary to divert peak stormwater to Hanson Quarry from Scotts Valley. Two alternatives were evaluated:

1. A 1.25 mile alternative that could potentially capture an estimated 190 AFY of water and would cost about $3.9 million, and
2. A 0.5 mile alternative that could potentially capture an estimated 123 AFY of water and would a cost about $2.7 million.

Both options would require pumping and neither option would include storage, treatment, and/or recharge. In addition, urban stormwater is by its very nature subject to significant hydrologic peaks which would make would require large facilities to capture and convey peak flows.

Therefore, surface water diversion and stormwater were removed from further consideration as source waters for the SMGB groundwater replenishment project due to significant challenges with reliability and costs. Stormwater, if diverted to the Scotts Valley WRF, could be a means of increasing flows to maximize the treatment capacity of the APF.

9.4 Water Conservation/Reduction

As noted earlier, SVWD embarked on significant conservation efforts in the 1990s when it became clear that groundwater levels declining at unsustainable rates. SVWD has been a member of the California Urban Water Conservation Council (CUWCC) since 2005 and adopted their 14 demand management measures which they have agree to implement as part of their good faith efforts to optimize water savings. The CUWCC calls these demand management measures Best Management Practices (BMPs). BMPs are examples of sound water management practices that have been found to be cost effective and practicable in most instances throughout California. The BMPs are generally consistent with the water conservation practices that have been implemented by SVWD under its existing Urban Water Management Plan.

The District actively pursues the implementation of the BMPs and as of 2015 the District's water use was lower than their SBX7-7 2020 target of 143.9 GCPD as reported in the SVWD's *2015 Urban Water*

Management Plan. The District will continue investing in water efficient practices and programs to ensure that it continues to meet its water savings goals and maintain compliance with SBX7-7 in the future. SVWD is actively involved in many programs to conserve water. Additional information on conservation policies, practices and BMPs is provided in the SVWD's *2015 Urban Water Management Plan*.

As previously noted, continued decreases in raw wastewater influent flows, as a result of the customers' conservation efforts, have the potential to further limit the amount of recycled water that can be produced. Since the District is supply limited, not all of the recycled water alternatives could be implemented, particularly in the summer when demand is high, unless wastewater inflows in the WRF increase.

9.5 No Project Alternative

The no project alternative is to maintain the status quo and continue to pump groundwater without supplemental replenishment, which does not improve storage in the aquifer and could reduce the reliability of SVWD's water supply into the future.

9.6 Evaluation of Alternatives

A high level screening evaluation was conducted to compare the wide range of alternatives described above using the following quantitative and qualitative criteria:

Quantitative Criteria

- **Relative Quantity of potable water produced/used**: A higher quantity receives a higher score and a lower quantity receives a lower score.
- **Relative Cost to deliver the water:** A lower cost project receives a higher score and a higher cost project receives a lower score.

Qualitative Criteria

- **Ease of Implementation and Operation:** This criterion measures the ease with which a project alternative can be implemented, considering administrative factors such as ease of permitting, land acquisition and/or easements, the level of interagency and stakeholder coordination required, and other potential administrative complexities that would need to be addressed to plan, implement and operate the project.
- **Environmental benefits:** This criterion considers factors such as impacts on surface water and groundwater quality, ecological / habitat impacts (such as benefits from increased instream baseflows from recharge of groundwater basin), and ability to meet existing and future water quality standards.

- **Regional benefits:** This criterion considers whether a project alternative is able to provide benefits on a basin-wide basis, instead of localized benefits to a particular city or district service area. For example, using recycled water for groundwater replenishment would benefit the entire SMGB region, while localized recycled water irrigation programs or water conservation programs within a specific service area may provide comparatively limited localized benefits.
- **Robustness against Impacts from Climate Change:** This criterion considers how a water supply source could be adversely affected by Climate Change impacts. In general, recycled water is considered more robust against Climate Change impacts compared to surface water sources.

The relative scoring (Low, Medium, High) of each alternative based on the above criteria are presented in Table 9-4.

Table 9-4: Screening Evaluation of Alternatives

Alternative	Quantity of Potable Water Produced/ Used	Cost of Water Delivered	Ease of Implementation	Environmental Benefits	Regional Benefits	Robustness against Climate Change Impacts
Local Irrigation Reuse	Medium	High	High	Low	Low	High
Expanded Irrigation Reuse	Low	High	Medium	Low	Medium	High
APF at Scotts Valley WRF and Groundwater Recharge	High	Low	Medium	Medium	High	High
APF at Hanson Quarry and Groundwater Recharge	High	Low	Low	Medium	High	High
APF at El Pueblo and Groundwater Recharge	High	Low	High	Medium	High	High
City of Santa Cruz Interconnection	Medium	Medium	Low	Low	Medium	Low to Medium
Stormwater Diversion and Delivery to Hanson Quarry	Low	Medium	High	Low	Low	Medium
Surface Water Diversion from Felton Diversion	Medium	Medium	Low	Medium	Medium	Low to Medium
Water Conservation/ Reduction	Low	High	High	Medium	Low	High
No Project Alternative	Low	High	High	None	None	Low to Medium

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9.7 Recommended Alternatives

Based on the screening evaluation of the alternatives conducted above, the groundwater replenishment alternatives using APF options are recommended for further consideration in this study because, although they have a relatively higher cost, they produce the most benefits in terms of quantity of potable water produced as well as environmental and regional benefits, and are less impacted by changing climate conditions and rainfall patterns.

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Section 10. Detailed Analysis of Recommended Alternatives

10.1 Description of Proposed Facilities, Preliminary Design Criteria and Pipeline Routes

Based on the alternatives evaluation described in Section 9, three alternatives involving the use of purified recycled water for groundwater replenishment are selected for further analysis in this section. A summary of the proposed facilities and the key differences between the three alternatives is provided in Table 10-1.

Table 10-1: Alternatives Selected for Detailed Analysis

Proposed Facilities	Alter-native 1	Alternative 2				Alter-native 3
		Option a	Option b	Option c	Option d	
APF						
at SV WRF	✓					
at Hanson Quarry		✓	✓	✓	✓	
at Scotts Valley El Pueblo Site						✓
Recycled Water Pipeline to APF						
Extension (Golf course-Quarry, 2,600 ft)		✓		✓		
Replacement (Mt. Hermon Rd., 6,875 ft)			✓		✓	
Purified Water Pipeline from APF to Wells						
Along Mt. Hermon Rd. (6,875 ft)	✓					
Within Hanson Quarry (1,600 ft)	✓	✓	✓	✓	✓	
Injection Wells						
Three injection wells	✓	ý	✓	✓	✓	✓*
Concentrate Disposal Pipeline to SV WRF						
Graham Hill Rd. (5,285 ft)		✓	✓			
Estrella Dr. (3,540 ft)				✓	✓	

* Repurpose 2 wells, install new well

Alternative 2 which is to locate the APF at Hanson Quarry has 4 pipeline options which were detailed in Sections 9.2.4.1 and 9.2.4.2 and are summarized as follows:

- Option a: 2,600' Tertiary Pipeline and 5,285' concentrate disposal pipeline

- Option b: 6,875’ Tertiary Pipeline and 5,285’ concentrate disposal pipeline
- Option c: 2,600’ Tertiary Pipeline and 3,540’ concentrate disposal pipeline
- Option d: 6,875’ Tertiary Pipeline and 3,540’ concentrate disposal pipeline

The proposed facilities and preliminary design criteria are further described as follows:

- **APF:** APF would have a designed treatment capacity of 1 MGD based on a peak wet weather month of 0.9 MGD as described in Section 9. A summary of APF design criteria for each process is provided below with a more detailed description found in Section 6. In Alternative 1, the APF would be constructed at the existing SV WRF. In Alternative 2, the APF would be constructed at Hanson Quarry. In Alternative 3, the APF would be constructed at SVWD’s El Pueblo Site.
    - UF Criteria: Nominal pore size of 0.02 microns for suspended particle and pathogen removal to attain 4 log removal of Giardia and Cryptosporidium. Two parallel UF membrane units each with 1 MGD capacity.
    - RO Criteria: for removal of dissolved organics such as EDCs, and PPCPs and 90 to 98 percent TDS removal to attain 1 log removal of Giardia and Cryptosporidium and removal of salts. Three RO units to provide a wide operating range by bringing one two or three units on line depending on the seasonal availability of feed water. RO units would operate at from 120-150 psi at 80 percent recovery.
    - UV/AOP criteria: for degradation of natural and synthetic organic compounds through oxidation and reduction for remaining low-level constituents and to attain 6-log inactivation of viruses, Giardia and Cryptosporidium. Two UV units, one primary and one standby each which could treat up to 1 MGD with a UV does of 900 ml/cm^3.
- **Recycled water pipeline to APF:** For Alternative 2 only, a pipeline would need to be constructed to deliver tertiary water from SV WRF to the APF at Hanson Quarry (recycled water pipeline). Two optional alignments have been proposed for the recycled water pipeline as described in Section 9.2.4.1. For Alternative 3, a short section of recycled water pipeline would be required to deliver tertiary water to the APF at the Scotts Valley El Pueblo Site. Pipeline location design is based on staying within existing road right of way and to maintain 70 psi in the distribution system.
- **Purified water pipeline to Injection Wells:** Pipeline to convey the purified water from the APF to the injection wells at Hanson Quarry. For Alternative 1, this pipeline would consist of approximately 6,875 feet mostly within Mt. Hermon Rd. and another 1,600 feet within Hanson Quarry. For all Alternative 2 options, it would be approximately 1,600 feet and would be located within Hanson Quarry. For Alternative 3, an existing raw water pipeline from Wells 11A and 11B to El Pueblo would be repurposed to deliver APF water

from the Scotts Valley El Pueblo Site. Pipeline location design is based on staying within existing road right of way and to maintain 70 psi in the distribution system.

- **Injection Wells:** Three injection wells would be used to recharge the groundwater with purified recycled water. The recharge rate for each well would be in the range of 200 to 300 gpm. (See Section 8 for the preliminary design criteria for the injection wells.)* For the purposes of cost estimating and groundwater modelling presented in Alternatives 1 and 2, it was assumed that the injection wells would be located at Hanson Quarry, but other well locations may be considered around Hanson Quarry during future project planning. For Alternative 3, existing Wells 11A and 11B to El Pueblo would be repurposed for injection and a new injection well would be drilled at the Scotts Valley-El Pueblo Site.
- **Concentrate Disposal Pipeline to SV WRF:** For Alternative 2 only, a new pipeline would be constructed to convey the concentrate generated by the APF for disposal at SV WRF (concentrate disposal pipeline). Two options are proposed for the concentrate disposal pipeline route as described in Section 9.2.4.2. For Alternative 3, concentrate would be concentrated on site, stored, and either be trucked to Santa Cruz for discharge through the ocean outfall or discharged to the sanitary sewer, especially in the winter, from the Scotts Valley El Pueblo Site. These seasonal concentrate discharge options are likely necessary as excess concentrate in the sanitary sewer when recycled water is used for irrigation would be problematic in the summer while should not be problematic in the winter. Further evaluation of concentrate discharge would be required during preliminary design which would include pipeline location based on staying within existing road right of way, to the greatest extent possible, and to maintain proper velocity in this gravity pipe.

The preliminary routes for the pipelines would be refined as the project progresses into the design phase based on the following considerations:

- ✓ Align pipelines in existing rights-of-way where possible
- ✓ Evaluate alignments to minimize environmental and biological impacts.
- ✓ Simplify the permitting process where possible
- ✓ Minimize pipeline lengths to reduce overall impacts and cost.

10.2 Cost Estimates

The estimated capital costs and operation and maintenance (O&M) costs of the recommended alternatives are summarized in Table 10-2 and presented in detail in the Appendix D Based on the preliminary project implementation schedule, it is estimated that project construction would begin in 2019 and be completed in 2020-2021 timeframe.

The following assumptions and factors have been used for estimating project costs:

- Capital recovery period (Project Life): 30 years at a 2% interest rate for annualizing capital costs

- Treatment design capacity of the APF: 1.0 MGD for peak month
- Average annual flow of product (purified water): 0.5 MGD (Note: As described in the previous sections, the average volume of purified water available for groundwater replenishment after meeting Pasatiempo GC secondary effluent needs is estimated to be 475 AFY which has been used for the purposes of estimating the per acre-foot cost using the conceptual design cost estimates.

10.2.1 Capital Costs

Table 10-2 provides a summary of the preliminary estimates of capital costs for Alternatives 1, 2a, 2b, 2c, 2d, and 3 which were prepared to compare the Alternatives. The capital cost estimate for Alternative 3 is the lowest, followed by Alternative 1, 2c, 2a, 2d and 2b. The difference between the highest and lowest capital cost alternatives is $5.7 million, or approximately 27% of the highest cost.

Table 10-2: Summary of Capital Costs

Capital Cost Components	Alternative					
	1	**2a**	**2b**	**2c**	**2d**	**3**
APF (Treatment Facility)*						
Advanced Purification Facility	7.63	6.98	6.98	6.98	6.98	6.98
Pump Stations	0.32	0.55	0.66	0.54	0.65	0.52
Additional Facility (Electrical, Controls, Yard Piping)	2.94	3.65	3.68	3.82	3.68	2.04
Subtotal (million $)	***10.89***	***11.18***	***11.32***	***11.34***	***11.31***	***9.54***
Other Infrastructure*						
Storage	1.00	0.92	0.92	0.92	0.92	0.42
Pipelines	1.61	1.66	2.67	1.42	2.42	1.26
Groundwater Wells	1.78	1.78	1.78	1.78	1.78	0.80
Subtotal (million $)	***4.39***	***4.36***	***5.37***	***4.12***	***5.12***	***2.48***
Project Administration**						
Engineering/Construction Management, Legal, Administrative	2.70	2.70	3.00	2.70	2.90	2.10
CEQA, Permitting, Outreach	1.50	1.50	1.50	1.50	1.50	1.30
Subtotal (million $)	***4.20***	***4.20***	***4.50***	***4.20***	***4.40***	***3.40***
Land Acquisition	**TBD**	**TBD**	**TBD**	**TBD**	**TBD**	**0**
Total Capital Costs (million $)	**19.48**	**19.74**	**21.19**	**19.66**	**20.83**	**15.42**

* Infrastructure cost estimates include taxes (9.75%), mobilization/bonds/permits (5%), contractor overhead and profit (12%) and contingency (25%). In addition, an escalation factor of 8% from present (2015) to mid-point of construction (2018) was applied. ENR construction cost index escalation rate for San Francisco, July 2015: 11155.07

** Project administration costs were estimated as percentages of the project cost (inclusive of contractor overhead and profit and contingency) as follows: CEQA/permitting/outreach @10%, engineering/construction management @16%, legal @1%, and administrative @2%.

10.2.2 Operation and Maintenance Costs

Table 10-3 provides a summary of the preliminary estimates of annual Operation and Maintenance (O&M) costs for Alternatives 1, 2a, 2b, 2c, 2d, and 3 which include energy, labor, chemical, and includes maintenance and materials such as membrane replacement. The O&M cost estimate for Alternative 3 is the lowest, followed by Alternatives 1, 2a, 2d, 2b and 2c. The difference between the highest and lowest annual O&M cost alternatives is $54,970, or approximately 10%.

Table 10-3: Summary of O&M Costs

O&M Cost Components	Alternative					
	1	2a	2b	2c	2d	3
Energy	67,200	67,200	83,200	65,600	81,600	76,800
Labor	250,000	250,000	250,000	250,000	250,000	250,000
Chemicals	70,000	70,000	70,000	70,000	70,000	70,000
Maintenance and Materials	60,000	105,000	106,000	109,000	106,000	69,000
Contingency (5%)	44,720	24,610	25,460	49,460	25,380	23,290
Total Annual O&M ($)	**491,920**	**516,810**	**534,660**	**544,060**	**532,980**	**489,090**

10.2.3 Economic Analysis

A cost per AF was calculated for each alternative by dividing the total cost of each alternative by the total volume of recycled water expected to be delivered (475 AFY for all alternatives to account for meeting Pasatiempo GS demands for secondary effluent). These values are shown in Table 10-4. The annualized per acre-foot cost (capital plus O&M) of Alternative 3 is the lowest, followed by Alternatives 1, 2a, 2c, 2d, and 2b and is the preferred alternative of the four APF alternatives.

Table 10-4: Summary of Annualized Per Acre-foot Life-Cycle Costs

Annualized Per Acre-foot Cost	Alternative					
	1	2a	2b	2c	2d	3
Capital Cost*	$1,430	$1,450	$1,580	$1,450	$1,540	$1,140
O&M Cost	$1,040	$1,090	$1,130	$1,150	$1,120	$1,030
Total ($/AFY)	$2,470	$2,540	$2,710	$2,600	$2,250	$2,170

* Assumes an estimated annual project yield of 475 AFY to account for meeting Pasatiempo GC demand, a project life of 30 years and an interest rate of 2%.

10.2.4 Energy Analysis

The energy costs associated with O&M of the project alternatives are presented in Table 10-5 below. Treatment energy estimates for membrane processes is based on 0.5 MGD operation for 6 months per year at a rate of killo watt hours (kwh) per 1,000 gallons per day at $0.16/kwh energy cost which is a typical blended energy cost in California. Pumping energy for pipelines which varies by alternative and groundwater injection pumping costs includes estimates of horse power requirements which is based on flow rate, total dynamic head, and redundancy factor multiplied by 6 month per year operation at a cost of $0.16/kwh energy. Other energy costs for items not accounted for in treatment and pumping were estimated at 2 percent of the treatment and pumping costs.

It is anticipated that the energy consumption for project construction would be similar for the alternatives presented herein since the project infrastructure requirements are similar. A 2007 American Society of Civil Engineers (ASCE) study estimated that construction energy nationwide in 2002 can be distributed to be about 75% for gas and diesel, 7% for natural gas, and 18% for electricity and represents about 2.5% of total construction industry expenditures including labor. The study also notes that "However the industry's energy consumption is not well understood because of the decentralized nature of construction and subcontracting activities."

A detailed analysis of energy consumption for greenhouse gas production estimating purposes including truck trips during construction and operation would be conducted for the proposed project during the CEQA environmental documentation preparation.

Table 10-5: Summary of O&M Energy Consumption and Costs

Energy Cost Components*	Alternative					
	1	2a	2b	2c	2d	3
Treatment	$43,200	$43,200	$43,200	$43,200	$43,200	$43,200
Conveyance	$12,800	$12,800	$28,800	$11,200	$27,200	$16,000
Groundwater Injection	$9,600	$9,600	$9,600	$9,600	$9,600	$16,000
Other	$1,600	$1,600	$1,600	$1,600	$1,600	$1,600
Annual Energy Cost ($)	**$67,200**	**$67,200**	**$83,200**	**$65,600**	**$81,600**	**$76,800**
Annual Energy Consumption (kWh)	**420,000**	**420,000**	**520,000**	**410,000**	**510,000**	**480,000**

*A unit cost of $0.16 per kWh was assumed.

10.3 Water Quality Impacts of Each Alternative

All the project alternatives evaluated in this section would have equally beneficial impacts on surface water and groundwater quality since the quantity and quality of purified water to be used for groundwater replenishment would be the same. The project would reduce the amount of treated wastewater effluent being discharged to the Pacific Ocean from SV WRF. In terms of the quantity of wastewater constituents, the project would not change the amount (mass) of constituents discharged to the Pacific Ocean since the concentrate generated from the RO process of the APF would be discharged via the existing outfall of the Scotts Valley WRF or directly at the Santa Cruz outfall.

The purified recycled water used for groundwater well injection would be treated to meet the Title 22 requirements for a GRRP, which would be of higher quality than the existing water quality of the SMGB (see Section 3.7), and would therefore have a beneficial impact on groundwater quality in the SMGB. In addition, groundwater recharge with purified recycled water would replenish over-drafted aquifers, and the higher groundwater levels are expected to provide increased baseflows in streams and springs, which would have a beneficial environmental impact.

10.4 Environmental and Climate Change Impacts of Each Alternative

The environmental impacts of each alternative are those impacts associated with construction including primarily noise and dust. Cultural resource impacts are unlikely as the project facilities are in disturbed areas. Biological resource impacts are likely in the alternatives requiring construction of treatment and/or groundwater injection facilities at Hanson Quarry as there is habitat for special status species such as the sand hill beetle. Operational impacts are limited to noise and emissions which can be mitigated. Long-term environmental benefits include increased baseflow to surface waters such as Bean Creek.

The climate change impacts related to the recommended project are likely limited to greenhouse gas emissions associated with construction and operation. The elevation of Scotts Valley at about 550 feet above sea level preclude rising sea levels from being an impact. The groundwater that will be replenished by the recommended project will provide a climate change benefit in that the water could be used by SVWD or others by arrangement, during long-duration droughts, expected to be associated with climate change, when recharge and local surface supplies are low.

A detailed analysis of environmental impacts including greenhouse gas emissions would be conducted for the proposed alternative during the CEQA environmental documentation preparation.

10.5 Potential Users and Quantities

All project alternatives would provide about 475 AFY of purified recycled water for groundwater recharge into SMGB after meeting Pasatiempo GC needs, and groundwater from the SMGB would be pumped and delivered to the customers of the SVWD, San Lorenzo Valley Water District, Mt. Hermon Association, as well as private pumpers regulated by Santa Cruz County. These groundwater users coordinate under the Santa Margarita Groundwater Basin Advisory Committee (SMGBAC) to monitor and manage the groundwater basin.

10.6 Peak Demand and Commitments

As described in Section 10.1, the volume of recycled water available for advanced purification and groundwater replenishment has been estimated and is dependent on the influent flows at the Scotts Valley WRF and the demands for recycled water from existing and projected future customers, who use recycled water for non-potable uses (irrigation). As described in Section 10.1, about 475 AFY would be available for groundwater replenishment after meeting the SVWD and Pasatiempo non-potable recycled water demands. During peak recycled water demand times for irrigation (i.e. summer), there would be limited excess recycled water available for groundwater replenishment, but during non-peak demand times of the year and the winter, excess recycled water would be available for groundwater replenishment.

Since the project involves injecting purified recycled water into the groundwater basin and extracting it for potable uses to existing customers of existing water purveyors, explicit commitments from the end users are not required. Prior to start of project implementation, an interagency agreement would be needed between the City and SVWD to formalize the commitments and the responsibilities of each agency regarding the project.

10.7 Reliability of Recycled Water Facilities

As mentioned previously, to supply recycled water for potable uses via groundwater replenishment, additional treatment of tertiary-treated wastewater would be provided at the APF that would be constructed as part of the proposed project. The design, engineering and operation of the APF would be in full compliance with the existing Title 22 requirements for groundwater replenishment (see Section 6). The APF would be designed and operated to ensure reliability (for public health protection), redundancy (to prevent failures and minimize public health impacts of any potential failures), robustness (to ensure protection against diverse contaminants and emerging contaminants), and resilience (to establish a plan for when failures occur). Overall, recycled water is a highly reliable and sustainable source of water because local wastewater is being continually produced. The reliability of the recycled water facilities would be the same for all alternatives.

10.8 Comparison of Alternatives and Recommended Alternative

Based on the comparison of estimated costs, energy analysis and water quality impacts presented above, Alternative 3 is selected as the preferred GWR Project because it has the lowest capital and O&M cost and would have similar energy and water quality impacts as Alternatives 1 and 2. In addition, Alternative 3 would also be preferred in terms of ease of implementation and institutional complexity, since the APF would be constructed on existing SVWD property, as opposed to constructing on the City of Scotts Valley WRF as for Alternative 1 or a private property (Hanson Quarry) as would be the case under Alternative 2.

10.9 Refined Analysis of Recommended Alternative 3

Alternative 3 was originally developed to repurpose only the SVWD Well 11A and 11B for injection and locate to the APF at the Scotts Valley El Pueblo Site. Other potential facilities for reuse include the existing sludge drying beds, which were evaluated for repurposing for concentrate management.

The existing sludge drying beds have a volume of about 30,000 gallons while the concentrate production is estimated to range from between 27,000 gallons per day in July up to 118,400 gallons per day in December when the APF operating rate is highest. Evaporation is highest in the summer when concentrate production is lowest. Therefore, the sludge drying beds have insufficient volume to be used for concentrate management. Instead, as shown on the potential layout of APF facilities at the Scotts Valley El Pueblo Site on Figure 6-5, the sludge drying beds area could be repurposed for concentration. The site plan also includes the addition of concentrate storage, particularly for the summer operations, where concentrate discharge to the sanitary sewer may result in increasing TDS of the recycled water delivered to Scotts Valley and Pasatiempo customers. In the summer, when concentrate quantities are relatively low, the concentrate can be stored and trucked to Santa Cruz for disposal. In the wetter months when recycled water use is low and concentrate quantities are high, concentrate can be discharged to the sanitary sewer for discharge through the ocean outfall.

The site plan also shows use of the existing building for membrane processes. Further refinement of operations, including concentrate concentration and disposal will need to occur as the project advances into design.

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Section 11. Implementation & Operation Plan

11.1 Implementation Plan

11.1.1 Coordination

It is anticipated that a Joint Powers Authority (JPA) would be formed to implement the proposed project. The following table presents a list of potential agencies that could be a part of the JPA, as well as other entities that would be stakeholders in the project.

Table 11-1: List of Potential JPA Agencies

Entity/Agency Name	SMGBAC Member*	Description	Type
City of Scotts Valley	Yes	The City is responsible for wastewater collection and treatment services in the southern SMGB and SVWD service area, including operation of the SV WRF. A portion of the secondary effluent from SV WRF is treated to Title 22 standards for tertiary disinfected recycled water and provided to SVWD for distribution to irrigation customers within SVWD service area.	Public
Scotts Valley Water District (SVWD)	Yes	SVWD is a water purveyor, and is also the owner and operator of the recycled water storage and distribution system for Scotts Valley.	Public
San Lorenzo Valley Water District (SLVWD)	Yes	SLVWD is a water purveyor that extracts groundwater from the SMGB and distributes the water to its customers (over 7300 connections). The emergency intertie water pipelines between SVWD and SLVWD as well as within SLVWD north and south service areas will be in place by 2016. SLVWD recently merged with Lompico County Water District.	Public
County of Santa Cruz	Yes	There are private parties that pump groundwater from the SMGB who are regulated by the County of Santa Cruz.	Public
Mt. Hermon Association	Yes	Mt. Hermon Association is a non-profit organization and a conference/camp facility located within SMGB. It extracts groundwater from the SMGB to supply its facility.	Private
City of Santa Cruz		City of Santa Cruz is a water purveyor that mainly provides surface water to its customers, but may be looking to diversify its water supply portfolio with additional groundwater from SMGB.	Public
Soquel Creek Water District		This water purveyor is located outside of SMGB, but if an interconnection with other water purveyors in the SMGB is constructed, then Soquel Creek Water District could supplement its existing water supply with water from SMGB.	Public
Private pumpers in Santa Cruz County		There are private parties that pump groundwater from the SMGB who are regulated by the County of Santa Cruz.	Private
Owners of Hanson Quarry		Hanson Quarry is being considered as the potential site for the injection wells of the proposed project.	Private

* Existing members of the Santa Margarita Groundwater Basin Advisory Committee (SMGBAC).

11.1.2 Ability and Timing of Users to Join System

For potable uses of recycled water via groundwater replenishment, the critical activities with respect to the ability and timing of users to join the system include the construction of the APF, associated conveyance and storage facilities, injection wells, and overall permitting. Once those key facilities are constructed, the existing water mains and laterals can be used to distribute the potable water to the end users without any additional construction. Therefore, the ability and timing of users to join the system are dependent upon the construction and operation schedule of these key facilities.

11.1.3 Tentative Water Recycling Requirements

For potable uses of recycled water via groundwater replenishment, SVWD would comply with California Code of Regulations Title 22 requirements for groundwater replenishment with recycled water, and will obtain the required permits and approvals from the RWQCB and DDW.

11.1.4 Commitments from Potential Users

SVWD has existing ordinances that govern use of recycled water which are found in Appendix E. Since the GWR Project involves injecting purified recycled water into the groundwater basin and extracting it for potable uses to existing customers of existing water purveyors, explicit commitments from the end users are not required. However, the City and SVWD would embark on a public outreach strategy to build public confidence about the safe use of purified water for groundwater replenishment in the SMGB. Prior to start of project implementation, an interagency agreement would be signed between the SVWD and City to formalize the commitments and the responsibilities of each agency regarding the proposed GWR Project.

11.1.5 Water Rights Impact

As per Section 1210 of the Water Code, as the owner of the treatment plant, City of Scotts Valley holds the water rights to the secondary effluent from SV WRF. A portion of this effluent is treated to Title 22 standards for tertiary disinfected recycled water and provided to SVWD for distribution to irrigation customers within SVWD service area, and SVWD holds the water rights to this tertiary recycled water.

Under the proposed GWR Project, the wastewater collection and treatment system of the region would remain unchanged. Treated wastewater that is not being used as recycled water for irrigation is currently being discharged to the Pacific Ocean. The proposed project would result in an increase in recycled water use and would therefore result in a reduction in wastewater effluent flows to the Pacific Ocean, but would not result in any decrease of flow in a “watercourse” (which is defined to exclude the ocean or a bay) as defined by Section 1211 of the Water Code. Therefore, no water rights issue is anticipated to occur with respect to Section 1211 requirements and reduction in wastewater effluent.

The interagency agreement between the JPA agencies would address the water rights issues associated with the project (i.e., injection of recycled water into and extraction from SMGB). This agreement would be finalized prior to finalizing the project details.

11.1.6 Permits, Right-of-Way, Design, and Construction

The proposed construction of the new APF would take place within existing SV WRF property boundaries, and no new land acquisition or easements would be required. The pipeline alignment from APF to the injection wells would primarily be constructed within existing rights-of way; however, encroachment permits or easements may be required depending on the final alignment.

Operational permits for the groundwater replenishment program would be obtained from the RWQCB and DDW prior to commencement of aquifer recharge.

11.1.7 Detailed Schedule

An overall schedule for the proposed GWR Project is presented in Table 11-2. Based on initial planning at the programmatic level, the project is anticipated to begin construction in 2019, and begin operation in 2020 or 2021. More detailed schedules for the next several years of the project are currently under development. Near-term activities in preparation of project implementation would include: planning for stakeholder/public outreach, formation of the regional governance structure, developing the funding strategy and preparing and submitting grant applications. Additional planning activities would include preliminary design, regulatory activities, environmental documentation preparation, additional groundwater studies, collection system source control plan, and treatment studies. Full implementation activities would include engineering, final design and construction.

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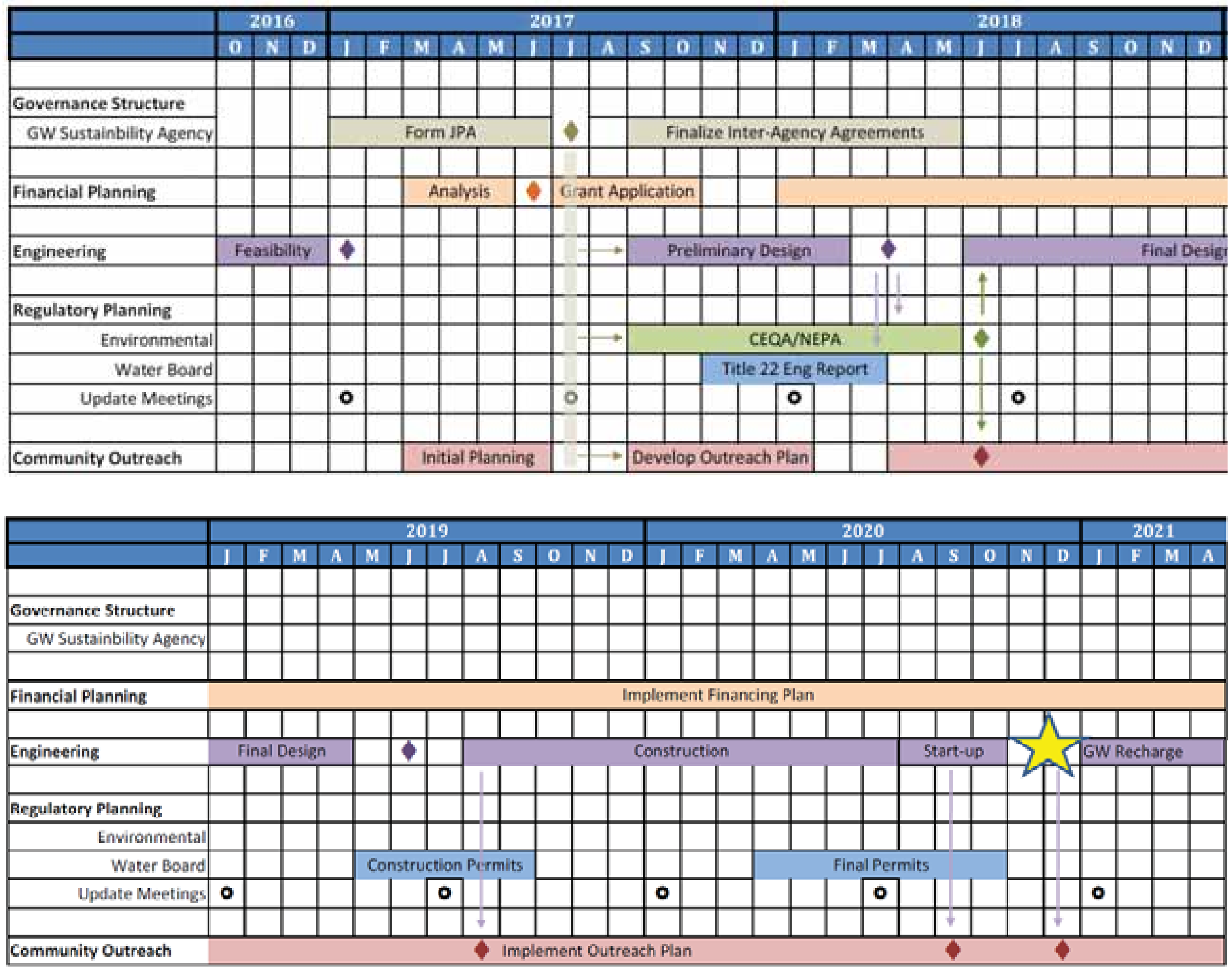
Table 11-2: Proposed GWR Project Schedule



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11.2 Operational Plan

The GWR Project would be implemented in partnership with the entities described in Section 11.1.1, and the JPA agreement would outline the responsibilities of the various agencies/entities in project implementation and operation. City of Scotts Valley (as SV WRF owner) may take the lead in the construction and O&M of the APF, and SVWD may take the lead in the construction and O&M of the injection wells and the associated pipelines, but the detailed responsibilities would be discussed during the JPA formation process and specified in the JPA agreement.

For the APF, which would produce purified water for groundwater replenishment, additional studies would be conducted prior to designing the full-scale facility and establish a monitoring plan to ensure protection of public health. Part of the permitting submittal would be a detailed operational plan that would describe operating parameters for each unit process, the reliability and redundancy features incorporated into the design, as well as the treatment and groundwater monitoring required as part of operations.

The proposed GWR Project would be implemented in several phases over 4 to 5 years. A detailed operations plan will be prepared after the JPA is formed and as individual project element details are determined.

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Section 12. Construction Financing and Revenue Plan

12.1 Sources and Timing of Funds for Design and Construction

The proposed GWR Project is in its initial planning phase, and potential funding sources would be identified as part of the financial planning phase. It is anticipated that the JPA to be formed for project implementation would be the applicant for grants. Potential funding sources that could be considered are listed below.

Table 12-1: Summary of Potential Funding Sources

Funding Name
State Proposition 1 Funding Programs, including: • California Water Commission (CWC) Proposition 1 Water Storage Investment Program • Department of Water Resources Groundwater Sustainability Program
Clean Water State Revolving Fund (SRF) Program
Infrastructure State Revolving fund
U.S. Army Corps of Engineers Water Resources Reform and Development Act (WRRDA)
U.S. Bureau of Reclamation Title XVI, Water Reclamation and Reuse Funding
NOAA Coastal Resiliency Grants Programs
Future California Bond Funding

12.2 Pricing Policy for Recycled Water

The proposed GWR Project would utilize purified recycled water for groundwater replenishment, which would be pumped from SMGB for potable uses. The pricing policy for the purified recycled water once extraction from the groundwater would the same as potable water from other sources.

12.3 Costs That Can be Allocated to Water Pollution Control

There are no costs that can be allocated to water pollution control since the SV WRF already meets pollution control requirements. Therefore, the proposed project is not expected to impact wastewater rates and a Proposition 218 rate in crease for wastewater is not expected to be required.

12.4 Annual Projections

12.4.1 Water Prices for Each User or Category of Users

The current SVWD water rates for potable and non-potable water users are listed in Table 12-2 and Table 12-3. Water prices or rates are set to recover both capital and O&M costs. SVWD's water charges for recycled water are currently set at a discounted rate of the potable water rate. SVWD regularly reviews rates, and rate review and adjustments, as needed, are anticipated during the implementation of the proposed project.

Table 12-2: Basic Service Charges

Charge by Meter Size	Potable Water Effective 12/13/2016 (BiMonthly Charge)	Recycled Water Effective, 12/13/2016 (Monthly Charge)
5/8"	$59.93	$6.00
3/4"	$94.29	$9.43
1"	$101.43	$10.15
1 1/2"	$238.39	$23.84
2"	$323.68	$32.37
3"	$577.08	$57.71
4"	$1,009.03	$100.91
6"	$2,155.44	$215.55
Private Fire Service RESIDENTIAL/COMMERCIAL	$16.30	Not applicable

Table 12-3: Potable and Recycled Water Rates

Rate Classification	per 1,000 gallons		per 1 acre-feet	
	Effective 12/13/2016	Effective 12/13/2017	Effective 12/13/2016	Effective 12/13/2017
POTABLE WATER RATES – TIERED (Residential with Individual Meters)				
0 TO 6,000 gallons	$4.89	$5.63	$1,593.30	$1,834.42
6,001 TO 12,000 gallons	$8.59	$9.82	$2,798.87	$3,199.64
12,001 TO 16,000 gallons	$13.72	$15.72	$4,470.37	$5,122.03
Over 16,000 gallons	$16.56	$18.99	$5,395.73	$6,187.49
POTABLE WATER RATES – UNIFORM RATES				
Commercial, Industrial, Institutional	$11.45	$13.14	$3,730.74	$4,281.39
Landscape Potable	$14.31	$16.43	$4,662.61	$5,353.37
Other	$12.75	$14.64	$4,154.32	$4,770.14
Qualifying Medical Needs Residential	$8.59	$9.82	$2,798.87	$3,199.64
RECYCLED WATER RATES				
Landscape Recycled	$11.77	$12.64	$3,835.01	$4,118.48

12.4.2 Recycled Water Used by Each User

The future users of the water produced by the proposed GWR Project are current and future customers of the water purveyors that currently withdraw groundwater from the SMGB, and potentially other water purveyors in the region that may participate in the project through interconnections. The amount of water allocated to each user would be determined by agreement amongst the participating entities.

12.4.3 Annual Costs for Recycling Project

See Section 10.2 for the annualized project costs. The annualized cost of the proposed GWR Project is expected to be approximately $1,830 per acre-feet (total of annualized capital cost and annual O&M cost).

12.4.4 Allocation of Costs to Users

The proposed GWR Project is anticipated to be implemented by a JPA composed of water purveyors in the region. The future users of the water produced by the proposed project would be the current and future customers of these water purveyors. Allocation of project costs to the users would be determined through negotiation amongst the JPA participants, and in turn each agency would determine how the costs would be allocated to its customers. It is anticipated that loan repayment on the initial capital costs for construction of the recycled water facilities as well as O&M costs would be recovered through customer charges. The rates would be reviewed periodically to ensure that sufficient revenue is collected to meet both capital and O&M financial obligations.

12.4.5 Unit Costs to Serve Each User or Category of Users and Unit Pricing

The project would not impact the existing user categories for the water rates. As described above, the capital and O&M costs for the project are anticipated to be allocated to the potable water users. The unit price for each user would be adjusted to recover the capital and O&M costs.

12.4.6 Sensitivity Analysis Assuming Portion of Potential Users Fail to Use Recycled Water

Since the project involves using purified recycled water for groundwater replenishmentand extraction for potable uses, sensitivity analysis with respect to failure to use recycled water is not applicable. If the irrigation customers do not take as much recycled water as anticipated, the only consequence is that more flow would be diverted for groundwater replenishment and associated benefits for streamflow. A means of reducing costs to account for lost revenue is for the agencies to reduce production to save O&M costs.

12.5 Sunk Costs and Indebtedness

The project would primarily be funded by loans and grants described previously. The facilities are sized based on current wastewater flows and water demands, thus reuse infrastructure is not being "overbuilt".

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Appendix A: SVWD and City of Scotts Valley Agreements

- RECYCLED WATER SUPPLY USE, MAINTENANCE, AND OPERATION AGREEMENT BETWEEN CITY OF SCOTTS VALLEY AND SCOTTS VALLEY WATER DISTRICT, 4 SEPTEMBER 2013

- FIRST AMENDMENT TO RECYCLED WATER SUPPLY USE, MAINTENANCE, AND OPERATION AGREEMENT BETWEEN CITY OF SCOTTS VALLEY AND SCOTTS VALLEY WATER DISTRICT FOR REDUCTION IN ENTITLEMENT, 20 APRIL 2016.

- SECOND AMENDMENT TO RECYCLED WATER SUPPLY USE, MAINTENANCE, AND OPERATION AGREEMENT BETWEEN CITY OF SCOTTS VALLEY AND SCOTTS VALLEY WATER DISTRICT FOR USE OUTSIDE THE CITY LIMITS, MAY 2016

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RECYCLED WATER SUPPLY USE, MAINTENANCE AND OPERATION AGREEMENT BETWEEN THE CITY OF SCOTTS VALLEY AND THE SCOTTS VALLEY WATER DISTRICT

This Recycled Water Supply Use, Maintenance and Operation Agreement (the "Maintenance Agreement") is entered into this 4th day of September, 2013 ("Effective Date"), by and between the City of Scotts Valley (the "City") and the Scotts Valley Water District, a County Water District organized pursuant to Sections 30000 *et. seq* of the California Water Code (the "District"). The City and the District are individually referred to herein as a "Party" and collectively referred to herein as the "Parties."

RECITALS:

A. On or about April 3, 1996, the Parties entered into that certain Reclaimed Water Supply Agreement Between the City of Scotts Valley and Scotts Valley Water District for Use of Reclaimed Water (the "1996 Agreement") which provided for the design, construction and operation of a 1,000,000 gallon per day ("1.0 MGD") tertiary treatment plant and pump station ("the TTP") which was constructed at the City's Wastewater Treatment Plant ("WWTP").

B. On or about June 4, 1997, the Parties entered into that certain First Amendment to Reclaimed Water Supply Agreement between the City of Scotts Valley and the Scotts Valley Water District for the Use of Reclaimed Water (the "First Amendment"). Said First Amendment dealt primarily with the sharing of costs relating to the extension of a water main extension into the Gateway South vicinity in order to supply sufficient water and pressure for adequate fire suppression and to assist a project known as the Inn at Scotts Valley.

C. On or about May 19, 2004, the Parties entered into that certain Second Amendment to Recycled [sic] Water Agreement Between the City of Scotts Valley and the Scotts Valley Water District for Use of Reclaimed Water (the "Second Amendment") which created certain changes in payments as called for in sections 6.1, 6.2, and 7.1 of the 1996 Agreement for a period of five (5) years. The terms of the Second Amendment expired in May 2009.

D. Following lengthy discussions and negotiations, the Parties have agreed to terminate the 1996 Agreement, the First Amendment and the Second Amendment (collectively, the "Initial Agreements") and enter into this Maintenance Agreement to address the ongoing use, operation of recycled water ("RCW") and the operation and maintenance of RCW improvements and facilities owned by the City and the District on the terms and conditions set forth herein.

NOW THEREFORE IT IS HEREBY AGREED:

1. Termination of the Initial Agreements: The Parties agree to terminate the Initial Agreements upon the Effective Date of this Maintenance Agreement.

2. Ownership of the WWTP, TTP and Distribution Facilities.

(a) City Facilities:

(i) Under the terms of the 1996 Agreement, the City and District designated a point of connection between the City's WWTP and TTP and the District's facilities from which recycled water ("RCW") may be drawn by the District ("Connection Point").

(ii) Except for the District's facilities located on City-owned property at the TTP, the City owns the WWTP, the TTP and all facilities to the Connection Point ("City Facilities") and the RCW distribution lines previously installed by the City along Mt. Hermon Road, Scotts Valley Drive and Glenwood Drive ("Existing Lines").

(iii) The City hereby grants to District an exclusive and irrevocable license to use the Existing Lines, subject to District's obligation to operate and maintain the Existing Lines in good operating condition. Upon expiration or sooner termination of this Agreement, the license shall terminate and District shall surrender the Existing Lines to the City in good operating condition, reasonable wear and tear excepted.

(b) District Facilities:

(i) The District owns facilities required to withdraw RCW at the Connection Point and to distribute RCW throughout the City, including, but not limited to, pump stations, wet well, pumps, pipelines, meters, controls and other distribution facilities ("District Facilities"), exclusive of any improvements or water distribution facilities which are owned and maintained by individual customers of the District in accordance with District rules and regulations.

(ii) Additionally, the District operates and maintains a pipeline and valve on City-owned property at the WWTP. The District is hereby granted the right to make minor changes to the pipeline and valve but cannot make significant upgrades or install additional District Facilities without the prior consent of the City.

3. Operation and Maintenance:

(a) City's Maintenance Obligations: The City shall operate, maintain, repair and replace, including reasonable upgrades from time to time, the City Facilities as necessary, so as to keep them in good operating condition, subject to the District's payment obligations herein.

(b) District's Maintenance Obligations: The District shall maintain, repair and replace, including reasonable upgrades from time to time, the District Facilities and the Existing Lines, as necessary, so as to keep them in good operating condition, subject to the City's payment obligations herein.

(c) No Obligation to Make Capital Improvements: Neither Party is required under this Agreement to make Capital Improvements relating to the City Facilities or the District Facilities, except as expressly set forth herein. As used herein, a Capital Improvement is a major non-recurring expenditure relating to the acquisition of existing buildings, land, or interests in land; new construction of buildings or other structures, including major additions and major alterations; or acquisition of major new equipment or major new service systems, unless such Capital Improvements are needed in order for either party to meet its obligations under this Agreement. In the event either Party desires to make Capital Improvements, the other Party has no obligation to make any financial contribution toward such improvement unless the Parties mutually agree to the need for the Capital Improvement and the allocation of costs for such Capital Improvement.

(d) Additional Facilities: In the event additional facilities are needed or desired by either Party on the City property, the Parties shall meet and confer regarding the benefits of the additional facilities. No additional facilities shall be acquired without the mutual consent of the Parties.

4. Production and Use of RCW:

(a) Minimum Production Requirements: Subject to this Agreement, the City agrees to use its best efforts to provide to District a daily amount of 1.0 MGD of RCW produced at the TTP, or such lesser amount produced by the City using its best efforts.

(b) District Use of RCW:

(i) The District shall be entitled to the use of all RCW generated by the TTP, but in no event more than 1.0 MGD, on the terms and conditions set forth in this Maintenance Agreement after the City uses the amount of RCW necessary to operate the WWTP. In the event that the District does not need all of the 1.0MGD RCW that the City produces, and a third party is interested in purchasing such excess, the District and the City agree to work cooperatively to provide such excess water to the third party if the circumstances so warrant. Nothing in this agreement shall preclude either party from being paid for the services, commodities or infrastructure necessary to provide such excess water to the third party. The provisions of this section do not apply to anything produced above 1.0 MGD.

(ii) The District has the right to market and sell RCW generated by the TTP, provided that all RCW sold shall be used within the city limits of the City ("City Limits"). The District shall not sell RCW generated by the TTP to customers located outside the City Limits, except in accordance with terms and conditions approved by both the District and the City, which terms and conditions may include provisions for the payment of compensation to the City by the new customer for the use of City-owned facilities which are located outside of the City Limits.

(iii) The District understands and agrees that RCW delivered to the District pursuant this Maintenance Agreement has limited uses and the District agrees to use or sell the RCW for only those uses or purposes which are legally permissible under the laws of the state and the directives of the appropriate regulatory agencies.

(c) City RCW Allotment: Notwithstanding anything to the contrary in Section 4(b), the City shall be entitled to use up to 16,456,000 gallons per year of RCW for purposes outside the operation of the WWTP (which is based on the City's current usage of 13,713,000 plus an additional 20%) ("City RCW Allotment"), subject to the following conditions: (1) the City RCW Allotment shall be separately metered; (2) the RCW shall only be used for maintenance of the City's public parks, landscaped medians and other City-owned, controlled, or operated property and facilities, and for no other uses; (3) the City shall not assign or transfer the use of all or any part of the City RCW Allotment to another person or entity, and any such assignment or transfer shall be voidable in the sole discretion of the District; and (4) for any usage by the City above the City RCW Allotment, the City shall pay the District for the amount of water used above the City RCW Allotment at 40% of the tiered potable water rates established by the District from time to time. Such payment shall be made within 30 days of the City's receipt of an invoice from District for the amount of water used above the City RCW Allotment. The City is also entitled to use the amount of RCW needed to operate the WWTP, which amount shall not be included in the 16,456,000 gallons per year allocated to the City.

(d) District's Right to Expansion Facilities: The District has the right from time to time to request the expansion of the TTP or to provide Capital Improvements to the TTP (referred to herein as the "Expansion Facility"), subject to the following: i) the parties shall meet and confer regarding the request; ii) the City shall determine in its sole an absolute discretion whether or not it wants to participate in the expansion; iii) in the event the City elects to participate in the expansion, the City and the District shall both approve the design team who will be retained by the City to design the Expansion Facility; iv) upon approval by the City and the District of the plans and specifications for the Expansion Facility, the City shall competitively bid the work; v) the District shall pay for all costs and expenses relating to the Expansion Facility including, but not limited to, the design, construction and inspection of the Expansion Facility; and vi) any additional costs which are necessary to Maintain the Expansion Facility shall be shared in accordance with a formula mutually agreed upon by the parties.

5. Limitations on Contractual Commitments: A Party to this Agreement shall not be deemed to be in default hereunder and the performance by such Party shall be suspended or excused to the extent that such performance is prevented as a result of war, insurrection, strikes, lockouts, riots, floods, earthquakes, fires, casualties, acts of god, acts of the public enemy, epidemics, quarantine and restrictions, or other cause beyond the control of the other Party ("Excused Delay"). Any Party shall use its best efforts to mitigate the effects and minimize the duration of an Excused Delay.

6. Quality of RCW:

(a) RCW Requirements: The City agrees to use its best efforts to supply RCW from the TTP and any Expansion Facility to the District which conforms to the requirements currently in effect as established by the California Regional Water Quality Control Board - Central Coast Region ("RWQCB"), or such other regulatory agency as may have authority over operations of the WWTP, TTP and any Expansion Facility, for discharge purposes and other purposes contemplated by this Agreement ("RCW Requirements"). The City and the District shall maintain all necessary approvals and permits to allow the City and the District's use of RCW from the TTP and any Expansion Facility for irrigation, recharging the aquifer and other lawful uses.

(b) Additional RCW Requirements: Should any regulatory agency modify the RCW Requirements so that Capital Improvements are required to be constructed ("Additional RCW Requirements"), the District may, in its discretion and at its expense, undertake steps to meet the Additional RCW Requirements pursuant to the process set forth in paragraph 4(d), above, or the District may elect not to undertake the steps necessary to meet the Additional RCW Requirements. In the event the District elects not to undertake the steps necessary to meet the Additional RCW Requirements, then the District shall have the right to terminate this Agreement, by delivering written notice of termination to the City. Sixty (60) days after delivery of such termination notice to the City, this Maintenance Agreement shall terminate. Notwithstanding the forgoing, to the extent Additional RCW Requirements allow the District use of the RCW by the TTP or any Expansion Facility for any purpose, the District shall have the right to continue using the RCW in any manner allowed by law subject to the terms of this Agreement.

(c) Temporary Suspension of Production:

(i) The Parties recognize that factors beyond the control of the City could cause operational difficulties at the WWTP resulting in the temporary production of RCW which does not meet the RCW Requirements for the District's intended uses. In such case, the City Engineer or his/her designee may temporarily suspend the availability of RCW from the City's facilities to the District ("Suspension of Production"). The City shall act diligently and use its best efforts to promptly re-establish the production of RCW which conforms to the RCW Requirements and shall re-establish the District's supply of such water accordingly.

(ii) The District assumes the risk of loss or damage resulting from a Suspension of Production due to causes beyond the City's control and hereby waives any right which it might have to recover from the City damages attributable to a Suspension of Production, provided that the City uses its best efforts and diligently pursues re-establishment of the production of RCW which conforms to the RCW Requirements.

(iii) The District recognizes that a standby RCW system may help mitigate loss or damage resulting from a Suspension of Production, and the District may elect to construct such standby capacity pursuant to paragraph 4(d), above.

7. District's Payment of TTP Operation and Maintenance Costs:

(a) District's Payment for Operation and Maintenance Costs Under Initial Agreements: Within thirty (30) days after the Effective Date, District shall pay the City for past-due costs in accordance with the terms of this Maintenance Agreement.

(b) TTP Operation and Maintenance Costs: During the term of this Agreement, the District shall pay to the City fifty five percent (55%) ("District's Share") of the actual costs and expenses defined in section c below which are necessary to maintain, operate and repair the TTP ("TTP Maintenance Costs").

(c) TTP Operation and Maintenance Costs Defined: TTP Operation and Maintenance Costs are the cost of labor (including social security, unemployment and other employment taxes); employee benefits such as retirement, medical/dental insurance; all materials, power supplies, all energy cost related to the TTP will metered by the City and paid by the District in accordance with the percentages outlined in subsection b above, equipment, chemicals, vehicle usage and necessary outside services necessary to maintain and repair the following TTP facilities:

(i) TTP Influent Pump Station (Diversion Pump Station) Pumps
Energy Costs
Maintenance – Actual cost

(ii) TTP Effluent Pump Station (Distribution Pump Station) Pumps
Energy Costs
Maintenance – Actual cost

(iii) Mixer
Energy Costs
Maintenance – Actual cost

(iv) Filtration Equipment
Energy Costs
Maintenance – Actual cost
Replacement Air Lift – Actual cost

(v) UV Disinfection System
Energy Costs
Lamp Replacement – Actual cost
Cleaning Cost – Actual cost
Maintenance – Actual cost

(vi) Overall TTP System Maintenance, Monitoring and Control
TTP System Maintenance Labor – Actual cost
TTP Lab Work, Labor – Actual cost
TTP Lab Equipment – Actual cost

(d) Exclusions from TTP Operation and Maintenance Costs: TTP Maintenance Costs do not include costs relating to the operation and maintenance of the WWTP, or the cost of employment-related claims, including workers compensation claims or defense costs, made by employees of the City.

(e) District Reserve Fund: In addition to paying for its share of TTP Maintenance Costs, the District shall pay 10% of the total TTP Maintenance Costs into a Reserve Fund until the Reserve Fund reaches Fifty Thousand Dollars ($50,000). The District shall replenish the Reserve Fund upon sixty (60) days prior written notice by the City if the Reserve Fund drops below Fifty Thousand Dollars ($50,000). All reserve funds shall be deposited by the City "in trust" in a special reserve fund account, separate and apart from all other funds of the City. The City is authorized to use the funds in the Reserve Fund to pay for the District's share of the cost of replacing necessary equipment, including electric motors and pumps, air lift pumps for sand filters and any other equipment necessary to Maintain the TTP and the Expansion Facility, if constructed, if such funds are needed outside the normal billing cycle.

(f) Annual Budget Process: During its annual budget process, the City shall establish a separate budget to estimate all TTP Maintenance Costs on an annual basis, and shall provide a copy of the said estimated budget to the District at least thirty (30) days prior to its adoption by the City.

(g) Billing for District's Share of TTP Maintenance Costs: Not more frequently than once every two (2) months during the term of this Maintenance Agreement, the City shall provide an invoice to the District based on the District's Share of the actual TTP Maintenance Costs for the previous billing period (the "Invoice"). Each Invoice shall include a "budget to actual" cost comparison and supporting information, including copies of receipts for equipment, a summary of labor costs, and sufficient information showing how the District's Share was calculated. District agrees to pay the amount set forth on each Invoice within thirty (30) days after receipt of the Invoice, subject to the District's right to verify the amount claimed in the Invoice. In the event of a controversy over the amount claimed on the Invoice, the City and the District agree to meet and confer within a reasonable time after request by either Party to attempt to resolve such dispute. Pending final resolution of such payment dispute, the District shall not be in default for failure to pay Invoice presented by the City.

(h) Metering and Measurement of Flows: Each Party shall allow the other Party access to any existing meters and records which measure and register RCW flow or energy costs from the TTP and Expansion Facility, if constructed; for purposes of verifying the quantity of RCW delivered and related energy costs.

(i) District's Right to Review Records. The District shall have the right to review and audit the City's books and records relating to the estimated and actual costs to maintain the TTP and the Expansion Facility (if constructed) from time to time upon reasonable notice. The City shall provide to the District any audits performed relating to the TTP Maintenance Cost budget.

8. Repayment of Monies Owed to District: On or about June 1997 the District issued bonds for a water reclamation project. The City's Redevelopment Agency used a portion of the water reclamation bond issue to finance recycled water main projects. The parties included the obligations to repay the monies used by the Redevelopment Agency in that certain First Amendment to Reclaimed Water Supply Agreement between the City of Scotts Valley and the Scotts Valley Water District for Use of Reclaimed Water dated June 4, 1997. The obligation to repay the outstanding balance of the money used shall continue until such time as payment has been made in full. The former Redevelopment Agency will continue to make annual payments in accordance with the payment schedule attached hereto as Exhibit A.

9. Compliance with Laws: Each Party shall comply with all applicable laws and regulations, including labor laws and regulations, relating to this Maintenance Agreement.

10. Indemnification:

(a) The District agrees to indemnify and hold harmless the City and the City's elected officials, officers, agents and employees from and against any and all liability, loss, costs, demands, damages, causes of action (whether legal; equitable or administrative), attorneys' fees and other expenses, arising out of this Maintenance Agreement ("Claims") which are attributable to the District's negligence, wrongful acts or breach of this Agreement or use of RCW unless such liability, loss, costs, demands, damages, cause of action, attorneys' fees or other expenses arise from the negligence or wrongful acts of the City.

(b) The City agrees to indemnify and hold harmless the District and the District's elected officials, officers, agents and employees from and against any and all Claims arising out of this Maintenance Agreement which are attributable to the City's negligence, wrongful acts or breach of this Agreement.

11. Term: This Maintenance Agreement shall be in effect for a period of 33 years and shall expire on August 1, 2046 ("Expiration Date") provided that no later than 18 months prior to the Expiration Date, the parties shall meet and confer regarding the possible extension of this Maintenance Agreement. If the Parties fail to meet and confer, this Maintenance Agreement shall continue in full force and effect for 18 months after a Party gives written notice to terminate this Maintenance Agreement to the other Party. In the event no agreement is reached, this Maintenance Agreement shall expire on August 1, 2046.

12. Resolution of Disputes: Should a dispute arise concerning the enforceability of this Maintenance Agreement or its breach, the parties hereto agree that the same shall be resolved by binding arbitration in the following manner:

(a) The City shall select one (1) arbitrator (at the City's cost).

(b) The District shall select one (1) arbitrator (at the District's cost).

(c) The two (2) selected arbitrators shall select a third arbitrator (at the joint cost of the City and the District from a list of arbitrators provided by the American Arbitration Association or JAMS. If the City and the District arbitrator cannot agree on an arbitrator from the list then the City and the District arbitrator shall in turn, one after the other, strike a name from the list until only one name remains, which person shall become the third arbitrator.

(d) The decision of a majority of the arbitrators shall be final, conclusive and binding on the parties hereto, enforceable by action in the Superior Court of the County of Santa Cruz. Attorneys' fees and costs shall be awarded the prevailing Party.

13. Notices: All notices given pursuant to this Agreement shall be addressed to the City or the District as set forth below or as the City or as the District may hereafter designate in writing, and shall be sent through the United States Mail, State of California, duly registered or certified, return receipt requested with postage prepaid thereon, or by any other method providing proof of delivery.

TO THE CITY:
City of Scotts Valley
Attn: City Manager
1 Civic Center Drive
Scotts Valley, CA 95066

TO THE DISTRICT:
Scotts Valley Water District
Attn: General Manager
P.O. Box 660006
Scotts Valley, CA 95067-0006

14. Integrated Agreement. There are no understandings or agreements between the parties as to the subject matter hereof except as herein expressly stated.

15. Assignment. Neither this Agreement nor any rights or obligations secured hereby shall be assigned or transferred by either Party without the prior express written consent of the other Party, which consent may be withheld in the sole discretion of any Party.

IN WITNESS WHEREOF, the Parties have entered into this Maintenance Agreement as of the Effective Date set forth above:

CITY:
City of Scotts Valley

By:________________________
Randy Johnson, Mayor

Attest:

By:________________________
Tracy A. Ferrara, City Clerk

APPROVED AS TO FORM:

By:________________________
Kirsten M. Powell, City Attorney

DISTRICT:
Scotts Valley Water District

By:________________________
Jay Mosley, President

Attest:

By:________________________
Piret Harmon, General Manager

APPROVED AS TO FORM

By:________________________
Robert E. Bosso, District Counsel

FIRST AMENDMENT TO RECYCLED WATER SUPPLY USE, MAINTENANCE AND OPERATION AGREEMENT BETWEEN THE CITY OF SCOTTS VALLEY AND THE SCOTTS VALLEY WATER DISTRICT FOR REDUCTION IN ENTITLEMENT

The City of Scotts Valley (the "City") and the Scotts Valley Water District ("District") hereby enter into this First Amendment to Recycled Water Supply Use, Maintenance and Operation Agreement ("Amendment") this 20th day of April, 2016.

RECITALS

A. The parties have heretofore on September 4, 2013 entered into a Recycled Water Supply Use, Maintenance and Operation Agreement ("Agreement") setting forth terms and conditions between the parties concerning the relationship of the parties with respect to City's Waste Water Treatment Plant ("WWTP") and the Tertiary Treatment Plant and Pump Station that was constructed at the City's Waste Water Facility by District.

B. The Agreement replaced pre-existing agreements and amendments thereto which covered similar and related subjects.

C. One of the terms of the Agreement was the provisions in Paragraph 4 of the Agreement which provided, inter alia, that City would use its best efforts to provide the District with 1.0 million gallons per day (MGD) of Recycled Water (RCW) and that the District would be entitled to use all of the RCW generated at the TTP, up to 1.0 MGD.

D. The City now has the opportunity to sell a portion of its wastewater to a third party, Pasatiempo Golf Club, which sale would reduce the amount available to the District and reduce the entitlement as set forth in Recital C above.

E. The District and the City have agreed for District to release a portion of its guaranteed entitlement as set forth in Paragraph 4 of Agreement in exchange for compensation from City as outlined below.

NOW THEREFORE, IT IS HEREBY AGREED:

1. In exchange for the consideration hereinafter set forth, the District agrees that the provisions of Paragraph 4 of the Agreement shall be modified to allow the City to divert up to 170,000 gallons per day of wastewater with an annual total not to exceed 35,000,000 gallons per year, unless the City has additional wastewater available at that time, from the tertiary treatment process and District agrees that it does not need the additional tertiary treated water for its uses.

2. In consideration for the District agreeing to reduce its entitlement to wastewater for tertiary treatment as set forth in Paragraph 1 above, the City agrees to pay to District the sum of Seven Hundred Fifty Eight Thousand One Hundred Sixty Nine dollars ($758,169.00). This sum is payable over a 5-year period with annual interest rate of 0.91% as follows: City makes five (5) annual payments of $155,817 each year on June 1st commencing in 2017.

3. The City and the District agree to coordinate the timing and diversion rates to achieve the most optimal operation of the tertiary treatment system.

4. The City shall have the right to terminate this Amendment at will with 90 days written notice. In the event the City gives notice to terminate this Amendment, the District shall claim the annual entitlement for 35,000,000 gallons per year and pay the City an amount which shall be calculated by multiplying $25,969 by the number of years remaining until August 1, 2046.

* *

Except for the terms immediately above set forth, both parties hereby ratify and affirm that provisions of Agreement.

City of Scotts Valley

Dated:

By: ______________________
Donna Lind, Mayor

Attested:

By: ______________________
Tracy A. Ferrara, City Clerk

Approved As To Form

By: ______________________
Kirsten Powell, City Attorney

Scotts Valley Water District

Dated:

By: ______________________
Danny Reber, Board President

Attested:

By: ______________________
Piret Harmon, General Manager

Approved As to Form

By: ______________________
Robert E. Bosso, District Counsel

SECOND AMENDMENT TO RECYCLED WATER SUPPLY USE, MAINTENANCE AND OPERATION AGREEMENT BETWEEN THE CITY OF SCOTTS VALLEY AND THE SCOTTS VALLEY WATER DISTRICT

FOR USE OUTSIDE THE CITY LIMITS

The City of Scotts Valley ("City") and the Scotts Valley Water District ("District") hereby enter into this Second Amendment to Recycled Water Supply Use, Maintenance and Operations Agreement ("Amendment").

RECITALS

A. The parties have heretofore on September 4, 2013 entered into a Recycled Water Supply Use, Maintenance and Operation Agreement ("Agreement") setting forth terms and conditions between the parties concerning the relationship of the parties with respect to City's Waste Water Treatment Plant ("WWTP") and the Tertiary Treatment Plant and Pump Station that was constructed at the City's Waste Water Facility by District.

B. Agreement replaced pre-existing agreements and amendments thereto which covered similar and related subjects.

C. Agreement provides that recycled water generated by the City's Tertiary Treatment Plant shall only be used within the city limits of the City of Scotts Valley except in accordance with terms and conditions approved by both the District and the City.

D. District desires to provide bulk recycled water to customers outside of the City limits and the City consents to sale of bulk recycled water for the permitted uses outside the city limits as set forth herein.

NOW THEREFORE, IT IS HEREBY AGREED:

1. Recycled water, to the extent available, may be provided by District as bulk recycled water to customers for use outside the city limits at a rate established by the District Board of Directors subject to the same requirements and conditions imposed on the District in the Agreement. Such rates are attached hereto as Exhibit A and are subject to change by District Board. In the event the District Board proposes to change such rates, the District General Manager shall meet and

confer with the City Manager prior to any such change being considered by the District Board.

2. The bulk recycled water rates (above 250 gallons per day) to customers living outside the City limits shall include a surcharge of twenty percent (20%) of the rate charged to compensate the City for the adverse impacts associated with the trucking of heavy water-filled trucks on City streets. The District shall collect the surcharge and make quarterly payments to City for the accrued amount.

Except for the terms immediately above set forth, both parties hereby ratify and affirm that provisions of Agreement.

City of Scotts Valley	Scotts Valley Water District
See attached	
Dated:	Dated:
By: ______________________	By: ______________________
Donna Lind, Mayor	Danny Reber, Board President
Attested	Attested
By: ______________________	By: ______________________
Tracy A. Ferrara, City Clerk	Piret Harmon, General Manager
Approved As To Form	Approved As to Form
By: ______________________	By: ______________________
Kirsten M. Powell, City Attorney	Robert E. Bosso, District Counsel

2. The bulk recycled water rates (above 250 gallons per day) to customers living outside the City limits shall include a surcharge of twenty percent (20%) of the rate charged to compensate the City for the adverse impacts associated with the trucking of heavy water-filled trucks on City streets. The District shall collect the surcharge and make quarterly payments to City for the accrued amount.

Except for the terms immediately above set forth, both parties hereby ratify and affirm that provisions of Agreement.

City of Scotts Valley	Scotts Valley Water District See attached.
Dated:	Dated:
By: ______________ Donna Lind, Mayor	By: ______________ Danny Reber, Board President
Attested	Attested
By: ______________ Tracy A. Ferrara, City Clerk	By: ______________ Piret Harmon, General Manager
Approved As To Form	Approved As to Form
By: ______________ Kirsten M. Powell, City Attorney	By: ______________ Robert E. Bosso, District Counsel

RATES FOR BULK RECYCLED WATER
(Rates per Thousand Gallons of Consumption)
Adopted by Resolution No. 14-15

	Effective 8/15/2014	Effective 12/15/2014	Effective 12/15/2015	Effective 12/15/2016
Basic Service Charge	$0.00	$0.00	$0.00	$0.00
Commodity Charge				
City Residents or District Customers (up to 250 gpd)	$0.00	$0.00	$0.00	$0.00
City Residents or District Customers (over 250 gpd)	$6.56	$6.81	$7.07	$7.34
All Other Customers	$8.19	$8.51	$8.84	$9.17

Appendix B: Relevant Permits

WASTE DISCHARGE REQUIREMENTS FOR THE CITY OF SCOTTS VALLEY WASTEWATER TREATMENT FACILITY ORDER NO. R3-2013-001, NPDES NO. **CA0048828**, for CITY OF SCOTTS VALLEY WASTEWATER TREATMENT PLANT, Santa Cruz County

- MASTER WATER RECYCLING REQUIREMENTS (PRODUCER) ORDER NO. 01-066 Waste Discharger Identification No.3 449902003, for CITY OF SCOTTS VALLEY WASTEWATER TREATMENT PLANT, Santa Cruz County

- MASTER WATER RECYCLING REQUIREMENTS (DISTRIBUTOR) ORDER NO. 01-067 Waste Discharger Identification No. 3 449902002, for SCOTTS VALLEY WATER DISTRICT, Santa Cruz County

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DRAFT ORDER NO. R3-2013-0001
NPDES NO. CA0048828

WASTE DISCHARGE REQUIREMENTS
FOR THE CITY OF SCOTTS VALLEY WASTEWATER TREATMENT FACILITY

The following Discharger is subject to waste discharge requirements as set forth in this Order.

Table 1. Discharger Information

Discharger	**City of Scotts Valley**
Name of Facility	**City of Scotts Valley Wastewater Treatment Facility**
Facility Address	**700 Lundy Lane**
	Scotts Valley, CA 95066
	Santa Cruz County
The U.S. Environmental Protection Agency (USEPA) and the Regional Water Quality Control Board classify this as a major discharge.	

Discharges by the City of Scott's Valley from the discharge point identified below are subject to waste discharge requirements as set forth in this Order.

Table 2. Discharge Location

Discharge Point	Effluent Description	Discharge Point Latitude	Discharge Point Longitude	Receiving Water
001	Secondary Treated Wastewater	36 º, 56 ', 08 " N	122 º, 01 ', 08 " W	Pacific Ocean (Monterey Bay National Marine Sanctuary)

Table 3. Administrative Information

This Order was adopted by the Regional Water Quality Control Board on:	**February 1, 2013**
This Order shall become effective on:	**March 27, 2013**
This Order shall expire on:	**February 1, 2018**
The Discharger shall file a Report of Waste Discharge in accordance with title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than:	**June 1, 2017**

I, Kenneth A. Harris Jr., Interim Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Coast Region on February 1, 2013.

____
Kenneth A. Harris Jr., Interim Executive Officer

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List of Attachments

I. FACILITY INFORMATION

The following Discharger is subject to the waste discharge requirements set forth in this Order.

Table 4. Facility Information

Discharger	City of Scotts Valley
Name of Facility	City of Scotts Valley Wastewater Treatment Facility
Facility Address	700 Lundy Lane
	Scotts Valley, CA 95076
	Santa Cruz County
Facility Contact, Title, and Phone	Scott Hamby, Manager, (831) 438-0739 shamby@scottsvalley.org
Mailing Address	One Civic Center Drive, Scotts Valley, CA 95066
Type of Facility	Publicly Owned Treatment Works (POTW)
Facility Design Flow	1.5 million gallons per day (MGD)

II. FINDINGS

The California Regional Water Quality Control Board, Central Coast Region (Central Coast Water Board) finds:

A. Background. The Discharger currently discharges waste pursuant to Order No. R3-2007-0013 and National Pollutant Discharge Elimination System (NPDES) Permit No.CA0048828. The Discharger submitted a Report of Waste Discharge, dated February 15, 2012, and applied to renew its NPDES permit to discharge up to 1.5 MGD of treated wastewater from the City's Wastewater Treatment Facility (Facility) to the Pacific Ocean and the Monterey Bay National Marine Sanctuary. Central Coast Water Board staff deemed the application complete on March 8, 2012.

For the purposes of this Order, references to the "discharger" or "Permittee" in applicable federal and state laws, regulations, plans, or policy are held to be equivalent to references to the Discharger herein.

B. Facility Description. The Discharger owns and operates a trunk sewer line and a domestic wastewater treatment plant (WWTP). The City of Scotts Valley WWTF currently treats wastewater by screening, grit removal, flow equalization, aeration, clarification, and disinfection. Biosolids are aerobically digested, dewatered, and disposed of at the Monterey Regional Waste Management Landfill in Marina, California. The wastewater treatment facility effluent is discharged through a 12,250-foot outfall/diffuser system in approximately 110 feet of water to the Monterey Bay National Marine Sanctuary and the Pacific Ocean.

Attachment B provides a topographic map of the area around the Facility. Attachment C provides a flow diagram of the Facility.

C. Legal Authorities. This Order is issued pursuant to CWA §402 and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the California Water Code (CWC), commencing with §13370. It shall serve as an NPDES permit for point source discharges from this facility to surface waters. This Order also serves as Waste Discharge Requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC, commencing with §13260.

D. Background and Rationale for Requirements. The Central Coast Water Board developed this Order's requirements based on information submitted in the application, through monitoring and reporting programs, and other available information. The Fact Sheet (Attachment F), which contains background information and rationale for the Order's waste discharge requirements, is hereby incorporated into this Order and constitutes part of the Findings for this Order. Attachments A through E are also incorporated into this Order.

E. California Environmental Quality Act (CEQA). Pursuant to Water Code § 13389, this action to adopt an NPDES permit is exempt from the provisions of the CEQA, Public Resources Code sections 21100-21177.

F. Technology-Based Effluent Limitations*.* CWA §301 (b) and USEPA's NPDES regulations at 40 CFR 122.44 require that permits include, at a minimum, conditions meeting applicable technology-based requirements and any more stringent effluent limitations necessary to meet applicable water quality standards. Discharges authorized by this Order must meet minimum federal technology-based requirements based on Secondary Treatment Standards established at 40 CFR 133 and Best Professional Judgment (BPJ) in accordance with 40 CFR 125.3. The Fact Sheet (Attachment F) includes a detailed discussion of the development of technology-based effluent limitations.

G. Water Quality-Based Effluent Limitations. CWA §301 (b) and NPDES regulations at 40 CFR 122.44(d) require permits include limitations more stringent than applicable federal technology-based requirements where necessary to achieve applicable water quality standards.

NPDES regulations at 40 CFR 122.44 (d)(1)(i) require permits include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a water quality standard, including numeric and narrative objectives within a standard. Where reasonable potential is established for a pollutant, but there is no numeric criterion or objective for the pollutant, water quality-based effluent limitations (WQBELs) must be established using: either (1) USEPA criteria guidance under CWA §304 (a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting the state's narrative criterion, supplemented with other relevant information, as provided at 40 CFR 122.44 (d)(1)(vi).

H. Water Quality Control Plans. The Central Coast Water Board adopted the *Water Quality Control Plan for the Central Coastal Basin* (Basin Plan), which designates beneficial uses, establishes water quality objectives (WQOs), and contains implementation programs and policies to achieve those objectives for receiving waters within the Region. To address ocean waters, the Basin Plan incorporates by reference the *Water Quality Control Plan for Ocean Waters of California* (the Ocean Plan). The Ocean Plan is discussed in further detail in section II.I of this Order.

The Basin Plan implements State Water Board Resolution No. 88-63, which establishes State policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply (MUN). Because TDS levels of marine waters exceed 3,000 mg/L, such waters are not considered suitable for municipal or domestic supply and therefore are an exception to Resolution No. 88-63. Table 5, below, provides beneficial uses established in the Basin Plan for the Pacific Ocean in the Monterey Bay National Marine Sanctuary.

Table 5. Basin Plan Beneficial Uses for the Pacific Ocean

Discharge Point	Receiving Water	Beneficial Use(s)
001	Pacific Ocean (Monterey Bay National Marine Sanctuary)	• Water Contact and Non-Contact Recreation • Industrial Service Supply • Navigation • Shellfish Harvesting • Commercial and Sport Fishing • Marine Habitat • Rare, Threatened, or Endangered Species • Wildlife Habitat

To protect the beneficial uses, the Basin Plan establishes water quality objectives and implementation programs. This Order's requirements implement the Basin Plan.

I. California Ocean Plan

The State Water Board adopted the *Water Quality Control Plan for the Ocean Waters of California, California Ocean Plan* (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, 2005, and 2009. The State Water Board adopted the latest amendment on September 15, 2009, and it was approved by the Office of Administrative Law on March 10, 2010, and subsequently the USEPA. The Ocean Plan is applicable, in its entirety, to point source discharges to the Pacific Ocean. The Ocean Plan identifies beneficial uses of ocean waters of the State to be protected as summarized in Table 6, below.

Table 6. Ocean Plan Beneficial Uses

Discharge Point	Receiving Water	Beneficial Uses
001	Pacific Ocean (Monterey Bay National Marine Sanctuary)	• Industrial Water Supply • Water Contact and Non-Contact Recreation, including Aesthetic Enjoyment • Navigation • Commercial and Sport Fishing • Mariculture • Preservation and Enhancement of Designated Areas of Special Biological Significance (ASBS) • Rare and Endangered Species • Marine Habitat • Fish Migration • Fish Spawning and Shellfish Harvesting

To protect the beneficial uses, the Ocean Plan establishes WQOs and a program of implementation. Requirements of this Order implement the Ocean Plan.

J. Alaska Rule. On March 30, 2000, USEPA revised its regulation that specifies when new and revised state and tribal water quality standards become effective for CWA purposes. [65 Fed. Reg. 24641 (April 27, 2000), codified at 40 CFR 131.21] Under the revised regulation (also known as the Alaska Rule), new and revised standards submitted to USEPA after May 30, 2000 must be approved by USEPA before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by May 30, 2000, may be used for CWA purposes, whether or not approved by USEPA.

K. Compliance Schedules and Interim Requirements. The State Water Board adopted Resolution No. 2008-0025 on April 15, 2008, titled *Policy for Compliance Schedules in National Pollutant Discharge Elimination System Permits*. Under limited circumstances, this policy allows the Regional Water Board to grant a compliance schedule based on a discharger's request and demonstration that it is infeasible to comply immediately with certain effluent limits. This policy became effective on August 27, 2008, superseding the Basin Plan's compliance schedule policy. This Order does not contain a compliance schedule or any interim effluent limits.

L. Recycled Water Policy. The Strategic Plan Update 2008-2012 for the Water Boards includes a priority to increase sustainable local water supplies available for meeting existing and future beneficial uses by 1,725,000 acre-feet per year, in excess of 2002 levels, by 2015, and ensure adequate water flows for fish and wildlife habitat. The State Water Board adopted the Recycled Water Policy via Resolution No. 2009-0011 on February 3, 2009[1]. The Recycled Water Policy is intended to support the Strategic Plan priority to Promote Sustainable Local Water Supplies. Increasing the acceptance and promoting the use of recycled water is a means towards achieving sustainable local water supplies and can result in reduction in greenhouse gases, a significant driver of climate change. The Recycled Water Policy is also intended to encourage beneficial use, rather than solely disposal, of recycled water.

The Recycled Water Policy calls for the development of regional groundwater basin/sub-basin salt/nutrient management plans. The State Water Board recognizes that, pursuant to the letter from statewide water and wastewater entities[2] dated December 19, 2008, and attached to Resolution No. 2009-0011 adopting the Policy, the local water and wastewater entities, together with local salt/nutrient contributing stakeholders, will fund locally driven and controlled, collaborative processes open to all stakeholders that will prepare salt and nutrient management plans for each basin/sub-basin in California, including compliance with CEQA and participation by Central Coast Water Board staff.

It is the intent of the Recycled Water Policy that salts and nutrients from all sources be managed on a basin-wide or watershed-wide basis in a manner that ensures attainment of water quality objectives and protection of beneficial uses. The State Water Board finds that the appropriate way to address salt and nutrient issues is through the development of regional or sub regional salt and nutrient management plans rather than through imposing requirements solely on individual projects. The Central Coast Water Board finds that a combination of regional management plans and individual or programmatic project requirements may be necessary to protect beneficial uses.

One of the primary components of the required regional salt/nutrient management plans is the development and implementation of groundwater basin/sub-basin monitoring programs. As specified in the Recycled Water Policy, salt/nutrient contributing stakeholders will be responsible for conducting, compiling, and reporting the monitoring data once the regional groundwater monitoring programs are developed.

A large number of technical reports and data contained within Central Coast Water Board files document widespread and increasing salt and nutrient impacts within the groundwater basins throughout the Central Coast Region, including the Scotts Valley Groundwater Basin.

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[1] http://www.swrcb.ca.gov/board_decisions/adopted_orders/resolutions/2009/rs2009_0011.pdf

[2] http://www.waterboards.ca.gov/board_info/agendas/2009/feb/020309_7_%20rw_policy_funding_letter.pdf

K. Recycled Water. The Discharger and the Scotts Valley Water District reuse recycled wastewater from the tertiary treatment plant, which treats Facility effluent to recycled water standards. State Department of Public Health (DPH) treatment standards for the use of recycled water are in CCR Title 22, Chapter 3. On July 13, 2001, the Central Coast Water Board adopted Master Water Recycling Requirements for the City of Scotts Valley Wastewater Treatment Plant, Santa Cruz County, and Master Water Recycling Requirements Order No. 01-067 for Scotts Valley Water District, Santa Cruz County. Orders Nos. 01-066 and 01-067 regulate the supply and distribution of tertiary-treated wastewater and were prepared in consultation with DPH. The Discharger indicated in the permit renewal application package that the recycled water flow totaled 47.92 million gallons (MG) in 2009, 49.35 MG in 2010, and 54.72 MG in 2011.

L. Stringency of Requirements for Individual Pollutants. This Order contains both technology-based and water quality-based effluent limitations for individual pollutants. As discussed in section IV. B of the Fact Sheet, the Order establishes technology-based effluent limitations for biochemical oxygen demand (BOD_5), carbonaceous biochemical oxygen demand (CBOD), total suspended solids (TSS), settleable solids, oil and grease, turbidity, and pH for Discharge Point 001. These technology-based limitations implement the minimum applicable federal technology-based requirements. The Order also contains effluent limitations in addition to the minimum federal technology-based requirements necessary to meet applicable water quality standards. These limitations are not more stringent than required by the CWA.

WQBELs have been scientifically derived to implement WQOs that protect beneficial uses. The WQOs and beneficial uses implemented by this Order are contained in the Basin Plan and the 2009 Ocean Plan, which was approved by USEPA on September 15, 2009. These WQOs and beneficial uses are the applicable water quality standards pursuant to 40 CFR 131.21 (c)1) and have been approved pursuant to federal law. WQBELs for toxic pollutants are derived using procedures established by the Ocean Plan.

All beneficial uses and WQOs contained in the Basin Plan and Ocean Plan were approved under State law and submitted to and approved by USEPA prior to May 30, 2000. Any WQOs and beneficial uses submitted to USEPA prior to May 30, 2000, but not approved by USEPA before that date, are nonetheless “applicable water quality standards for purposes of the CWA” pursuant to 40 CFR 131.21 (c)(1). Collectively, this Order’s restrictions on individual pollutants are no more stringent than required to implement the requirements of the CWA.

M. Antidegradation Policy. NPDES regulations at 40 CFR 131.12 require that State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California’s antidegradation policy in State Water Board Resolution No. 68-16, which incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that the existing quality of waters be maintained unless degradation is justified based on specific findings. The Central Coast Water Board’s Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. As discussed in section IV.D.2 in the Fact Sheet, the permitted discharge is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16.

N. Anti-Backsliding Requirements. CWA §402 (o)(2) and §303 (d)(4) and NPDES regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. As discussed in section IV.D.1 of the Fact Sheet, effluent limitations and other requirements established by this Order satisfy applicable anti-backsliding provisions of the CWA and federal regulations.

O. Endangered Species Act. This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code §2050 to §2097) or the federal Endangered Species Act (16 U.S.C.A. §1531 to §1544). This Order requires compliance with effluent limits, receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Discharger is responsible for meeting all requirements of State and federal law regarding threatened and endangered species.

P. Monitoring and Reporting. NPDES regulations at 40 CFR 122.48 require that all NPDES permits specify requirements for recording and reporting monitoring results. California Water Code §13267 and §13383 authorize the Central Coast Water Board to require technical and monitoring reports. The Monitoring and Reporting Program (Attachment E) establishes monitoring and reporting requirements to implement federal and State requirements.

Q. Standard and Special Provisions. Standard Provisions, which apply to all NPDES permits in accordance with NPDES regulations at 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment D. The Central Coast Water Board has also included in this Order special provisions applicable to the Discharger. A rationale for the special provisions contained in this Order is provided in the Fact Sheet (Attachment F).

R. Provisions and Requirements Implementing State Law. The provisions/requirements in subsections IV.B, IV.C, and V.B of this Order are included to implement state law only. These provisions/requirements are not required or authorized under the federal CWA; consequently, violations of these provisions/requirements are not subject to the enforcement remedies that are available for NPDES violations.

S. Notification of Interested Parties. The Central Coast Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe Waste Discharge Requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet accompanying this Order.

T. Consideration of Public Comment. The Central Coast Water Board, in a public meeting, heard and considered all comments pertaining to the discharge. Details of the Public Hearing are provided in the Fact Sheet of this Order.

U. Privilege to Discharge. A permit and the privilege to discharge waste into waters of the State is conditional upon the discharge complying with provisions of Division 7 of the CWC and the CWA (as amended or supplemented by implementing guidelines and regulations); any with any more stringent effluent limitations necessary to implement water quality control plans, to protect beneficial uses, and to prevent nuisances.

III. DISCHARGE PROHIBITIONS

A. Discharge of treated wastewater to the Pacific Ocean at a location other than those listed below is prohibited.

1. City of Santa Cruz Ocean Outfall (36° 56’ 08” N. Latitude, 122° 04’ 08” W. Longitude), and

2. Approved recycled water reuse sites authorized by Order Nos. 01-066 and 01-067.

B. Discharge of any waste in any manner other than as described by this Order, excluding storm water regulated by General Permit No. CAS000001 (Waste Discharge Requirements for

Discharges of Storm Water Associated with Industrial Activities), and excluding the reuse of treated wastewater in accordance with California Water Code sections 13500 – 13577 (Water Reclamation) and California Code of Regulations title 22, sections 60301 – 60357 (Water Recycling Criteria), is prohibited.

C. The discharge of any radiological, chemical, or biological warfare agent or high-level radioactive waste into the ocean is prohibited.

D. Federal law prohibits the discharge of sludge by pipeline to the Ocean. The discharge of municipal or industrial waste sludge directly to the Ocean or into a waste stream that discharges to the Ocean is prohibited. The discharge of sludge digester supernatant, without further treatment, directly to the Ocean or to a waste stream that discharges to the Ocean, is prohibited.

E. The overflow or bypass of wastewater from the Discharger's collection, treatment, or disposal facilities and the subsequent discharge of untreated or partially treated wastewater, except as provided for in Attachment D, Standard Provision I. G (Bypass), is prohibited. The discharge shall not cause or contribute to adverse impacts to beneficial uses of water or to threatened or endangered species and their habitat.

F. Creation of a condition of pollution, contamination, or nuisance, as defined by Section 13050 of the CWC, is prohibited.

G. The discharge shall not cause or contribute to adverse impacts to beneficial uses of water or to threatened or endangered species and their habitat.

IV. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

A. Effluent Limitations – Discharge Point 001

1. Final Effluent Limitations – Discharge Point 001

a. The Discharger shall maintain compliance with the following effluent limitations at Discharge Point 001, with compliance measured at Monitoring Location EFF-001 as described in the attached Monitoring and Reporting Program (MRP) (Attachment E).

Table 7. Effluent Limitations

Parameter	Units	Effluent Limitations			
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Maximum
BOD_5	mg/L	30	45	90	--
	lbs/day [1]	375	565	1,125	--
$CBOD_5$	mg/L	25	40	85	--
	lbs/day [1]	310	500	1,060	--
TSS	mg/L	30	45	90	--
	lbs/day [1]	375	565	1,125	--
Oil & Grease	mg/L	25	40	75	--
	lbs/day [1]	310	500	940	--
Settleable Solids	mL/L/hr	1.0	1.5	--	3.0
Turbidity	NTUs	75	100	--	225
pH [2]	pH units	6.0 – 9.0 at all times			
Total Coliform Bacteria [3]	MPN/100 mL	--	--	--	100,000 [4]
Fecal Coliform Bacteria [3]	MPN/100 mL	--	--	--	20,000 [5]

Enterococcus Bacteria	MPN/100 mL	--	--	--	2,400 [6]
TCDD Equivalents [7]	µg/L	0.00000045	--	--	--
	lbs/day [1]	0.000000056	--	--	--
Acute Toxicity	TUa	--	--	3.7	--
Chronic Toxicity	TUc	--	--	115	--

[1] Mass limitations are applicable when flows are equal to or less than 1.5 MGD.

[2] Excursions from the effluent limit range are permitted subject to the following limitations (40 CFR 401.17):

a. The total time during which the pH values are outside the required range of pH values shall not exceed 7 hours and 26 minutes in any calendar month; and

b. No individual excursion from the range of pH values shall exceed 60 minutes.

Note: 40 CFR 401.17(2)(c) notes that, for the purposes of 40 CFR 401.17, "excursion" is defined as "an unintentional and temporary incident in which the pH value of discharge wastewater exceeds the range set forth in the applicable effluent limitations guidelines." The State Board may adjust the requirements set forth in paragraph 40 CFR 401.17 (a) with respect to the length of individual excursions from the range of pH values, if a different period of time is appropriate based upon the treatment system, plant configuration, or other technical factors.

[3] Total and fecal coliform values are based on existing dilution ratio of 114:1 with a 12% factor of safety. The 12% factor of safety was applied during previous permit renewals to conform to the Anti-Backsliding provisions of 40 CFR 122.4(l), and is continued herein.

[4] No more than ten percent of the total samples collected in any 60-day period shall exceed 40,000 per 100 mL.

[5] The fecal coliform concentration, based on a minimum of not less than five samples for any 30-day period, shall not exceed a log mean of 20,000 per mL.

[6] The enterococcus concentration, based on a minimum of not less than five samples for any 30-day period, shall not exceed a log mean of 2,400 per 100 mL for any 30-day period, or a log mean of 1,200 per 100 mL for any 6-month period.

[7] TCDD Equivalents shall mean the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7.8-CDFs) multiplied by their respective toxicity factors, as listed in Appendix I of the 2009 Ocean Plan.

b. Total Chlorine Residual. The Discharger shall maintain compliance with the following effluent limitations for total chlorine residual at Discharge Point 001, with compliance measured at Monitoring Location EFF-001, as described in the attached MRP.

Table 8. Effluent Limitations for Total Chlorine Residual

Pollutant	Unit	6-Month Median	Daily Maximum	Instantaneous Maximum
Total Residual Chlorine [1]	µg/L	0.23	0.92	6.9
	lb/day	2.9	12	86

* See Attachment A for applicable definitions.

[1] Water quality objectives for total chlorine residual applying to intermittent discharges not exceeding two hours shall be determined using the following equation:

$\log_y = -0.43(\log_x) + 1.8$ where: y = the water quality objective (in µg/L) to apply when chlorine is being discharged; and

x = the duration of uninterrupted chlorine discharge in minutes.

The applicable effluent limitation must then be determined using Equation No. 1 from the Ocean Plan.

c. **Percent Removal:** The average monthly percent removal of BOD_5, $CBOD_5$ and TSS shall not be less than 85 percent.

d. **Initial Dilution:** The minimum initial dilution of treated effluent at the point of discharge to Monterey Bay shall not be less than 114 to 1 (seawater to effluent) at any time.

e. **Dry Weather Flow:** Effluent daily dry weather flow shall not exceed a monthly average of 1.5 MGD.

2. Interim Effluent Limitations – Not Applicable

B. Land Discharge Specifications – Not Applicable

C. Reclamation Specifications

1. Reclamation use of tertiary treated wastewater shall comply with applicable state and local requirements regarding the production and use of reclaimed wastewater, including requirements of California Water Code (CWC) sections 13500-13577 (Water Reclamation) and Department of Health Services (DHS) regulations at Title 22, sections 60301-60357 of the California Code of Regulations (Water Recycling Criteria).

2. Wastewater shall be disinfected by either:

   a. A chlorine disinfection process that provides a CT (the product of total chlorine residual and modal contact time measured at the same point) value of not less than 450 milligram-minutes per liter at all times with a modal contact time of at least 90 minutes, based on the peak dry-weather design flow, or

   b. A disinfection process that, when combined with the filtration process, has been demonstrated to inactivate and/or remove 99.999 percent of the plaque-forming units of F-specific bacteriophage MS2, or polio virus, or a virus that is at least as resistant to disinfection as the polio virus.

3. Wastewater to be reclaimed/recycled shall be filtered to meet the criteria of a or b:

   a. Wastewater shall be coagulated and passed through natural undisturbed soils or a bed of filter media:

      i. At a rate that does not exceed 5 gallons per minute (gpm) per square foot of surface area in mono, dual, or mixed media gravity, upflow, or pressure filtration systems, or does not exceed 2 gpm per square foot of surface area in traveling bridge automatic backwash filters; and

      ii. Turbidity of the filtered wastewater shall not exceed any of the following:

         1) An average of 2 NTU within a 24-hour period;

         2) 5 NTU more than 5 percent of the time within a 24-hour period; and

         3) 10 NTU at any time.

b. Wastewater to be reclaimed/recycled shall be passed through a microfiltration, ultrafiltration, nanofiltration, or reverse osmosis membrane so that turbidity of the filtered wastewater does not exceed any of the following:

i. 0.2 NTU more than 5 percent of the time within a 24-hour period; and

ii. 0.5 NTU at any time.

4. When treated effluent is being reclaimed/recycled for irrigation, it shall be sampled and analyzed daily for total coliform bacteria.

5. When treated effluent is being reclaimed/recycled for irrigation, it shall be continuously monitored for turbidity following filtration. Compliance with performance criteria of section IV.C.3.a or IV.C.3.b shall be determined using the levels of recorded turbidity taken at intervals of no more than 1.2 hours over a 24-hour period. If the continuous turbidity meter and/or recorder fail, grab sampling at a minimum frequency of 1.2 hours may be substituted for a period of up to 24 hours.

6. No irrigation use with treated effluent shall take place within 50 feet of any domestic water supply well.

7. No impoundment of treated effluent shall occur within 100 feet of any domestic water supply well.

8. Reclaimed water shall be confined to areas of authorized use without discharge to surface waters or drainage ways.

9. Personnel involved in producing, transporting, or using reclaimed water shall be informed of possible health hazards that may result from contact and use of reclaimed water.

10. Spray irrigation of reclaimed water shall be accomplished at a time and in a manner to minimize ponding and contact with the public.

11. Delivery of reclaimed water shall be discontinued when these Reclamation Specifications cannot be met.

12. All reclamation reservoirs and other areas with public access shall be posted, in English and Spanish, to warn the public that reclaimed wastewater is being stored or used.

13. Reclaimed water systems shall be properly labeled and regularly inspected to ensure proper operation, absence of leaks, and absence of illegal connections.

V. RECEIVING WATER LIMITATIONS

A. Surface Water Limitations

The following receiving water limitations are based on water quality objectives (Water-Contact Standards) contained in the Ocean Plan and are a required part of this Order. Compliance shall be determined from samples collected at stations representative of the area as defined below.

1. Within a zone bounded by the shoreline and a distance of 1,000 feet from the shoreline or the 30-foot depth contour, whichever is farther from the shoreline, and in areas outside this zone designated for water contact recreation use by the Central Coast Water Board, but including all kelp beds, the following bacteriological objectives shall be maintained throughout the water column.

   30-Day Geometric Mean – The following standards are based on the geometric mean of the five most recent samples from each receiving water monitoring location.

   a. Total coliform density shall not exceed 1,000 per 100 mL;
   b. Fecal coliform density shall not exceed 200 per 100 mL; and
   c. Enterococcus density shall not exceed 35 per 100 mL.

   Single Sample maximum;

   a. Total coliform density shall not exceed 10,000 per 100 mL;
   b. Fecal coliform density shall not exceed 400 per 100 mL; and
   c. Enterococcus density shall not exceed 104 per 100 mL.
   d. Total coliform density shall not exceed 1,000 per 100 mL when the fecal coliform to total coliform ratio exceeds 0.1

2. At all areas where shellfish may be harvested for human consumption, as determined by the Central Coast Water Board, the following bacteriological objectives shall be maintained throughout the water column:

   a. The median total coliform density shall not exceed 70 organisms per 100 mLs, and in not more than 10 percent of samples shall coliform density exceed 230 organisms per 100 mLs.

3. Floating particulates and grease and oil shall not be visible.

4. The discharge of waste shall not cause aesthetically undesirable discoloration of the ocean surface.

5. Natural light shall not be significantly reduced at any point outside the initial dilution zone as the result of the discharge of waste.

6. The rate of deposition of inert solids and the characteristics of inert solids in ocean sediments shall not be changed such that benthic communities are degraded.

7. The dissolved oxygen concentration shall not at any time be depressed more than 10 percent from that which occurs naturally as a result of the discharge of oxygen- demanding waste.

8. The pH shall not be changed at any time more than 0.2 units from that which occurs naturally.

9. The dissolved sulfide concentration of waters in and near sediments shall not be significantly increased above that present under natural conditions.

10. The concentration of substances set forth in Chapter IV, Table B of the Ocean Plan in marine sediments shall not be increased to levels that would degrade indigenous biota.

11. The concentration of organic materials in marine sediments shall not be increased to levels that would degrade marine life.

12. Nutrient levels shall not cause objectionable aquatic growths or degrade indigenous biota.

13. Discharges shall not cause exceedances of water quality objectives for ocean waters of the State established in Table B of the Ocean Plan.

14. Marine communities, including vertebrate, invertebrate and plant species, shall not be degraded.

15. The natural taste, odor, and color of fish, shellfish, or other marine resources used for human consumption shall not be altered.

16. The concentration of organic materials in fish, shellfish, or other marine resources used for human consumption shall not bioaccumulate to levels that are harmful to human health.

17. Discharge of radioactive waste shall not degrade marine life.

B. Groundwater Limitations

Activities at the facility shall not cause exceedance/deviation from the following water quality objectives for groundwater established by the Basin Plan.

1. Groundwater shall not contain taste or odor producing substances in concentrations that adversely affect beneficial uses.

2. Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life; or result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.

VI. PROVISIONS

A. Standard Provisions

1. **Federal Standard Provisions.** The Discharger shall comply with all Standard Provisions included in Attachment D of this Order.

2. **Regional Water Board Standard Provisions.** The Discharger shall comply with all Regional Water Board Standard Provisions included in Attachment D-1 of this Order. The Discharger shall comply with the following provisions:

   Before changing the point of discharge, place of use, or purpose of use of treated wastewater that results in a decrease of flow in any portion of an inland watercourse, in any way, the Discharger shall file a petition with the State Water Board, Division of Water Rights, and receive approval for such a change. (Water Code section 1211.)

B. Monitoring and Reporting Program (MRP) Requirements

Pursuant to CWC sections 13267 and 13383, the Discharger shall comply with the Monitoring and Reporting Program (MRP), and future revisions thereto, in Attachment E of this Order, and all notification and general reporting requirements throughout this Order and Attachment D. Where notification or general reporting requirements conflict with those stated in the MRP (e.g., annual report due date), the Discharger shall comply with the MRP requirements. All monitoring shall be conducted according to 40 CFR 136, *Guidelines Establishing Test Procedures for Analysis of Pollutants*.

The Discharger is required to provide these technical or monitoring reports because it is the owner and operator responsible for the waste discharge and compliance with this Order. The Central Coast Water Board needs the information to determine the Discharger's compliance with this Order, assess the need for further investigation and/or enforcement action, and to protect public health and safety and the environment.

C. Special Provisions

1. Reopener Provisions

This permit may be reopened and modified in accordance with NPDES regulations at 40 CFR 122 and 124, as necessary, to include additional conditions or limitations based on newly available information or to implement any USEPA-approved, new State water quality objective.

2. Special Studies, Technical Reports and Additional Monitoring Requirements

a. Toxicity Reduction Requirements

If the discharge consistently exceeds an effluent limitation for toxicity specified by Section IV of this Order, the Discharger shall conduct a Toxicity Reduction Evaluation (TRE) in accordance with the Discharger's TRE Workplan.

A TRE is a study conducted in a step-wise process designed to identify the causes of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate. A TIE is a set of procedures to identify the specific chemical(s) responsible for toxicity. These procedures are performed in three phases - characterization, identification, and confirmation using aquatic organism toxicity tests. The TRE shall include all reasonable steps to identify the source of toxicity. The Discharger shall take all reasonable steps to reduce toxicity to the required level once the source of toxicity is identified.

The Discharger shall maintain a TRE Workplan, which describes steps that the Discharger intends to follow if a toxicity effluent limitation in this Order is exceeded. The workplan shall be prepared in accordance with current technical guidance and reference material, including EPA/600/2-88-070 (for industrial discharges) or EPA/600/2-88/062 (for municipal discharges), and shall describe, at least:

i. Actions proposed to investigate/identify the causes/sources of toxicity,

ii. Actions proposed to mitigate the discharge's adverse effects, to correct the non-compliance, and/or to prevent the recurrence of acute or chronic toxicity (this list of action steps may be expanded, if a TRE is undertaken), and

iii. A schedule to implement these actions.

When monitoring detects effluent toxicity greater than a limitation in this Order, the Discharger shall resample immediately, if the discharge is continuing, and retest for whole effluent toxicity. Results of an initial failed test and results of subsequent monitoring shall be reported to the Executive Officer (EO) as soon as possible after receiving monitoring results. The EO will determine whether to initiate enforcement action, whether to require the Discharger to implement a TRE, or to implement other measures. The Discharger shall conduct a TRE considering guidance provided by the USEPA's Toxicity Reduction Evaluation Procedures, Phases 1, 2, and 3 (EPA document Nos. EPA 600/3-88/034, 600/3-88/035, and 600/3-88/036, respectively). A TRE, if necessary, shall be conducted in accordance with the following schedule.

Table 9. Toxicity Reduction Evaluation—Schedule

Action Step	When Required
Take all reasonable measures necessary to immediately reduce toxicity, where the source is known.	Within 24 hours of identification of noncompliance.
Initiate the TRE in accordance to the Workplan.	Within 7 days of notification by the EO
Conduct the TRE following the procedures in the Workplan.	Within the period specified in the Workplan (not to exceed one year, without an approved Workplan)
Submit the results of the TRE, including summary of findings, required corrective action, and all results and data.	Within 60 days of completion of the TRE
Implement corrective actions to meet Permit limits and conditions.	To be determined by the EO

3. Best Management Practices and Pollution Prevention

a. Salt and Nutrient Management

i. The Discharger shall continue to update and implement an ongoing Salt Management Program, with the intent of reducing mass loading of salts in recycled water and attainment of applicable WQOs for salts in the Scotts Valley Groundwater Basin. Additionally, the Discharger shall develop and implement a Nutrient Management Program, with the intent of reducing mass loading of nutrients in treated effluent and attainment of applicable WQOs for nutrients in the same basin.

ii. Salt reduction measures shall focus on all potential salt contributors to the collection system, including water supply, commercial, industrial, and residential dischargers.

iii. Nutrient reduction measures shall focus on optimizing wastewater treatment processes for nitrification and denitrification, or other means of nitrogen removal. Reduction measures may also include source control (non-human waste from commercial and industrial sources) as appropriate.

iv. As part of the salt/nutrient management program, the Discharger shall submit an annual report of salt and nutrient reduction efforts. This salt/nutrient management report shall be included as part of the annual report described in the MRP (Attachment E). The report shall be submitted by January 30th, and shall include (at a minimum):

1) Salt Component

a) Calculations of annual salt mass discharged to (influent) and from (effluent) the wastewater treatment or recycling facility with a description of contributing sources;

b) Analysis of wastewater evaporation/salt concentration effects;

c) Analysis of groundwater monitoring results for salts constituents and associated trends;

d) Analysis of potential impacts of salt loading on the groundwater basin (focusing on the relationship between salt concentration in the discharge and the Basin Plan water quality objectives);

e) A summary of existing salt reduction measures;

f) Recommendations and time schedules for implementation of any additional salt reduction measures; and

g) Status of the implementation of the Salt Management items detailed in Section 4.3 of the Discharger's May 2009 Salt Management Study.

2) Nutrient Component

a) Calculations of annual nitrogen mass (for all identified species) discharged to (influent) and from (effluent) the wastewater treatment or recycling facility with a description of contributing sources;

b) Analysis of wastewater treatment facility ability to facilitate nitrification and denitrification, or other means of nitrogen removal;

c) Analysis of groundwater monitoring results for nitrogen constituents and trends;

d) Analysis of potential impacts of nitrogen loading on the groundwater basin (focusing on the relationship between salt concentration in the discharge and the Basin Plan water quality objectives);

e) A summary of existing nitrogen loading reduction measures; and

f) Recommendations and time schedules for implementation of any additional nitrogen loading reduction measures.

v. As an alternative to the Salt and Nutrient Management Program requirements described above, upon Executive Officer approval, the Discharger may submit documentation and summary of participation in a regional salt/nutrient management plan implemented under the provisions of State Water Board Resolution No. 2009-0011 (Recycled Water Policy).

b. Pollutant Minimization Program

The 2009 California Ocean Plan establishes guidelines for the Pollutant Minimization Program (PMP). At the time of the proposed adoption of this Order, no known evidence was available that would require the Discharger to immediately develop and conduct a PMP. The Central Coast Water Board will notify the Discharger in writing if such a program becomes necessary. The 2009 Ocean Plan PMP language is included herein to provide guidance in the event that a PMP must be developed and implemented by the Discharger.

PMP Goal: The PMP goal is to reduce all potential pollutant sources through pollutant minimization (control) strategies, including pollution prevention measures, to maintain pollutant effluent concentrations at or below the effluent limitation.

Pollution prevention measures may be particularly appropriate for persistent bioaccumulative priority pollutants where there is evidence of impairment of beneficial uses. The completion and implementation of a Pollution Prevention Plan, required in accordance with California Water Code §13263.3 (d), will fulfill the PMP requirements.

Determining the Need for a PMP:

1. The Discharger must develop and conduct a PMP if all of the following conditions are true:
   (a) The calculated effluent limitation is less than the reported Minimum Level.
   (b) The concentration of the pollutant is reported as DNQ.
   (c) There is evidence showing that the pollutant is present in the effluent above the calculated effluent limitation.

2. Alternatively, the Discharger must develop and conduct a PMP if all of the following conditions are true:
   (a) The calculated effluent limitation is less than the Method Detection Limit (MDL).
   (b) The concentration of the pollutant is reported as ND.
   (c) There is evidence showing that the pollutant is present in the effluent above the calculated effluent limitation.

Special Provision for Evidence of Pollutant Presence

Central Coast Water Boards may include special provisions in the discharge requirements to require the gathering of evidence to determine whether the pollutant is present in the effluent at levels above the calculated effluent limitation. Examples of evidence may include:

1. Health advisories for fish consumption;
2. Presence of whole effluent toxicity;
3. Results of benthic or aquatic organism tissue sampling;
4. Sample results from analytical methods more sensitive than methods included in the permit (in accordance with the 2009 Ocean Plan, Chapter III, Section C.4.b, *Deviations from Minimum Levels in Appendix II*; or
5. The concentration of the pollutant is reported as DNQ and the effluent limitation is less than the MDL.

Elements of a PMP

The Central Coast Water Board may consider cost-effectiveness when establishing the requirements of a PMP. The program shall include actions and submittals acceptable to the Central Coast Water Board including, but not limited to, the following:

1. An annual review and semiannual monitoring of potential sources of the reportable pollutant, which may include fish tissue monitoring and other bio-uptake sampling;
2. Quarterly monitoring for the reportable pollutant in the influent to the wastewater treatment system;
3. Submittal of a control strategy designed to proceed toward the goal of maintaining concentrations of the reportable pollutant in the effluent at or below the calculated effluent limitation;
4. Implementation of appropriate cost-effective control measures for the pollutant, consistent with the control strategy; and,
5. An annual status report that shall be sent to the Central Coast Water Board including:
   (a) All PMP monitoring results for the previous year;
   (b) A list of potential sources of the reportable pollutant;
   (c) A summary of all action taken in accordance with the control strategy; and,
   (d) A description of actions to be taken in the following year.

4. Construction, Operation and Maintenance Specifications

The Facility shall be operated as specified under Standard Provision D of Attachment D.

5. Special Provisions for Municipal Facilities (POTWs Only)

a. Biosolids Management.

i. Sludge and wastewater solids must be disposed of in a municipal solid waste landfill, reused by land application, or disposed of in a sludge-only landfill in accordance with 40 CFR Parts 258 and 503 and Title 23, Chapter 15 of the CCR. If the Discharger desires to dispose of solids and/or sludge in a different manner, a request for permit modification must be submitted to the USEPA and to the Regional Water Board at least 180 days prior to beginning the alternative means of disposal.

ii. Sludge that is disposed of in a municipal solid waste landfill must meet the requirements of 40 CFR Part 258 pertaining to providing information to the public. In the annual self-monitoring report, the Discharger shall include the amount of sludge placed in the landfill as well as the landfill to which it was sent.

iii. All requirements of 40 CFR Part 503 and 23 CCR Chapter 15 are enforceable whether or not the requirements of those regulations are stated in an NPDES permit or any other permit issued to the Discharger.

iv. The Discharger shall take all reasonable steps to prevent and minimize any sludge use or disposal in violation of this Order that has a likelihood of adversely affecting human health or the environment.

v. Solids and sludge treatment, storage, and disposal or reuse shall not create a nuisance, such as objectionable odors or flies, and shall not result in groundwater contamination.

vi. The solids and sludge treatment and storage site shall have adequate facilities to divert surface water runoff from adjacent areas to protect the boundaries of the site from erosion, and to prevent drainage from the treatment and storage site. Adequate protection is defined as protection, at the minimum, from a 100-year storm and protection from the highest possible tidal stage that may occur.

vii. The discharge of sewage sludge and solids shall not cause waste material to be in position where it is, or can be, conveyed from the treatment and storage sites and deposited in waters of the State.

viii. The Discharger shall submit an annual report to the USEPA and the Regional Water Board containing monitoring results and pathogen and vector attraction reduction requirements, as specified by 40 CFR Part 503. The Discharger shall also report the quantity of sludge removed from the Facility and the disposal method. This self-monitoring report shall be postmarked by February 1 of each year and report for the period of the previous calendar year.

ix. Sludge and wastewater solids must be disposed of in a municipal solid waste landfill, reused by land application, or disposed of in a sludge-only landfill in accordance with 40 CFR Parts 258 and 503 and Title 23, Chapter 15 of the CCR. If the Discharger desires to dispose of solids and/or sludge in a different manner, a request for permit modification must be submitted to the USEPA and to the Regional Water Board at least 180 days prior to beginning the alternative means of disposal.

x. Sludge that is disposed of in a municipal solid waste landfill must meet the requirements of 40 CFR Part 258 pertaining to providing information to the public. In the annual self-monitoring report, the Discharger shall include the amount of sludge placed in the landfill as well as the landfill to which it was sent.

xi. All requirements of 40 CFR Part 503 and 23 CCR Chapter 15 are enforceable whether or not the requirements of those regulations are stated in an NPDES permit or any other permit issued to the Discharger.

xii. The Discharger shall take all reasonable steps to prevent and minimize any sludge use or disposal in violation of this Order that has a likelihood of adversely affecting human health or the environment.

xiii. Solids and sludge treatment, storage, and disposal or reuse shall not create a nuisance, such as objectionable odors or flies, and shall not result in groundwater contamination.

xiv. The solids and sludge treatment and storage site shall have adequate facilities to divert surface water runoff from adjacent areas to protect the boundaries of the site from erosion, and to prevent drainage from the treatment and storage site. Adequate protection is defined as protection, at the minimum, from a 100-year storm and protection from the highest possible tidal stage that may occur.

xv. The discharge of sewage sludge and solids shall not cause waste material to be in position where it is, or can be, conveyed from the treatment and storage sites and deposited in waters of the State.

xvi. The Discharger shall submit an annual report to the USEPA and the Regional Water Board containing monitoring results and pathogen and vector attraction reduction requirements, as specified by 40 CFR Part 503. The Discharger shall also report the quantity of sludge removed from the Facility and the disposal method. This self-monitoring report shall be postmarked by February 1 of each year and report for the period of the previous calendar year.

b. Pretreatment.

i. The Discharger shall continue to implement standards and limits for industrial discharges to the sanitary sewer system, pursuant to Scotts Valley City Ordinance 79.18.

ii. The Discharger shall comply and ensure affected indirect dischargers comply with the Standard Provisions.

iii. With its annual report, the Discharger shall describe the Discharger’s pretreatment activities over the previous calendar year. The report shall, at a minimum, include the following:

(a) A discussion of upset, interference, or pass-through incidents, if any, at the POTW which the Discharger knows or suspects were caused by industrial users of the POTW system;

(b) An updated list of the Discharger's industrial users, including their names and addresses;

(c) A summary of inspection and sampling activities conducted by the Discharger during the previous calendar year to gather information and data regarding industrial users;

(d) A summary of the Discharger's compliance and enforcement activities during the previous calendar year;

(e) A description of any significant change in the Discharger's pretreatment program, including modifications or amendments to the City's Ordinance No. 79.18;

(f) A summary of any public participation activities to involve and inform the public; and

(g) A description of any changes in biosolids disposal methods.

6. Other Special Provisions

a. **Discharges of Storm Water.** For the control of storm water discharged from the site of the wastewater treatment and disposal facilities, if applicable, the Discharger shall seek authorization to discharge under and meet the requirements of the State Water Board's Water Quality Order 97-03-DWQ, NPDES General Permit No. CAS0000001, Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities.

b. **Statewide General Waste Discharge Requirements for Sanitary Sewer Systems (State Water Board Order No. 2006-0003-DWQ)**. This General Order, adopted on May 2, 2006, is applicable to all "federal and state agencies, municipalities, counties, districts, and other public entities that own or operate sanitary sewer systems greater than one mile in length that collect and/or convey untreated or partially treated wastewater to a publicly owned treatment facility in the State of California." The purpose of the General Order is to promote the proper and efficient management, operation, and maintenance of sanitary sewer systems and to minimize the occurrences and adverse effects of sanitary sewer overflows. The Discharger has obtained coverage under the General Order and must comply with its requirements.

6. Compliance Schedules – Not Applicable

VII. COMPLIANCE DETERMINATION

Compliance with the effluent limitations contained in Section IV of this Order will be determined as specified below:

A. General.

Compliance with effluent limitations for reportable pollutants shall be determined using sample reporting protocols defined in the MRP and Attachment A of this Order. For purposes of reporting and administrative enforcement by the Regional and State Water Boards, the Discharger shall be deemed out of compliance with effluent limitations if the concentration of the reportable pollutant in the monitoring sample is greater than the effluent limitation and greater than or equal to the reported Minimum Level (ML).

B. Multiple Sample Data.

When determining compliance with a measure of central tendency (arithmetic mean, geometric mean, median, etc.) of multiple sample analyses and the data set contains one or more reported determinations of “Detected, but Not Quantified” (DNQ) or “Not Detected” (ND), the Discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:

1. The data set shall be ranked from low to high, ranking the reported ND determinations lowest, DNQ -determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.

2. The median value of the data set shall be determined. If the data set has an odd number of data points, then the median is the middle value. If the data set has an even number of data points, then the median is the average of the two values around the middle unless one or both of the points are ND or DNQ, in which case the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.

ATTACHMENT A – DEFINITIONS

Acute Toxicity:

a. Acute Toxicity (TUa)

Expressed in Toxic Units Acute (TUa)

$$TUa = \frac{100}{\text{96-hr LC 50\%}}$$

b. Lethal Concentration 50% (LC 50)

LC 50 (percent waste giving 50% survival of test organisms) shall be determined by static or continuous flow bioassay techniques using standard marine test species as specified in Ocean Plan Appendix III. If specific identifiable substances in wastewater can be demonstrated by the discharger as being rapidly rendered harmless upon discharge to the marine environment, but not as a result of dilution, the LC 50 may be determined after the test samples are adjusted to remove the influence of those substances.

When it is not possible to measure the 96-hour LC 50 due to greater than 50 percent survival of the test species in 100 percent waste, the toxicity concentration shall be calculated by the expression:

$$TUa = \frac{\log(100 - S)}{1.7}$$

where: S = percentage survival in 100% waste. If S > 99, TUa shall be reported as zero.

Areas of Special Biological Significance (ASBS): are those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of STATE WATER QUALITY PROTECTION AREAS.

Arithmetic Mean (μ), also called the average, is the sum of measured values divided by the number of samples. For ambient water concentrations, the arithmetic mean is calculated as follows:

Arithmetic mean = μ = Σx / n where: Σx is the sum of the measured ambient water concentrations, and n is the number of samples.

Average Monthly Effluent Limitation (AMEL): the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

Average Weekly Effluent Limitation (AWEL): the highest allowable average of daily discharges over a calendar week (Sunday through Saturday), calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges **measured during that week.**

Bioaccumulative pollutants are those substances taken up by an organism from its surrounding medium through gill membranes, epithelial tissue, or from food and subsequently concentrated and retained in the body of the organism.

Carcinogenic pollutants are substances that are known to cause cancer in living organisms.

Chlordane shall mean the sum of chlordane-alpha, chlordane-gamma, chlordene-alpha, chlordene-gamma, nonachlor-alpha, nonachlor-gamma, and oxychlordane.

Chronic Toxicity: This parameter shall be used to measure the acceptability of waters for supporting a healthy marine biota until improved methods are developed to evaluate biological response.

a. Chronic Toxicity (TUc)

   Expressed as Toxic Units Chronic (TUc)

$$TUc = \frac{100}{NOEL}$$

b. No Observed Effect Level (NOEL)

   The NOEL is expressed as the maximum percent effluent or receiving water that causes no observable effect on a test organism, as determined by the result of a critical life stage toxicity test listed in Ocean Plan Appendix II.

Carcinogenic pollutants are substances that are known to cause cancer in living organisms.

Coefficient of Variation (CV) is a measure of the data variability and is calculated as the estimated standard deviation divided by the arithmetic mean of the observed values.

Daily Discharge: Daily Discharge is defined as either: (1) the total mass of the constituent discharged over the calendar day (12:00 am through 11:59 pm) or any 24-hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g., concentration).

The daily discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day or other 24-hour period defined as a day) or by the arithmetic mean of analytical results from one or more grab samples taken over the course of the day.

For composite sampling, if 1 day is defined as a 24-hour period other than a calendar day, the analytical result for the 24-hour period will be considered as the result for the calendar day in which the 24-hour period ends.

DDT shall mean the sum of 4,4’DDT, 2,4’DDT, 4,4’DDE, 2,4’DDE, 4,4’DDD, and 2,4’DDD.

Degrade: Degradation shall be determined by comparison of the waste field and reference site(s) for characteristic species diversity, population density, contamination, growth anomalies, debility, or supplanting of normal species by undesirable plant and animal species. Degradation occurs if there are significant differences in any of three major biotic groups, namely, demersal fish, benthic invertebrates, or attached algae. Other groups may be evaluated where benthic species are not affected, or are not the only ones affected.

Detected, but Not Quantified (DNQ) are those sample results less than the reported Minimum Level, but greater than or equal to the laboratory’s MDL.

Dichlorobenzenes shall mean the sum of 1,2- and 1,3-dichlorobenzene.

Dilution Credit is the amount of dilution granted to a discharge in the calculation of a water quality-based effluent limitation, based on the allowance of a specified mixing zone. It is calculated from the dilution ratio or determined through conducting a mixing zone study or modeling of the discharge and receiving water.

Downstream Ocean Waters shall mean waters downstream with respect to ocean currents.

Dredged Material: Any material excavated or dredged from the navigable waters of the United States, including material otherwise referred to as "spoil".

Effluent Concentration Allowance (ECA) is a value derived from the water quality criterion/objective, dilution credit, and ambient background concentration that is used, in conjunction with the coefficient of variation for the effluent monitoring data, to calculate a long-term average (LTA) discharge concentration. The ECA has the same meaning as waste load allocation (WLA) as used in USEPA guidance (Technical Support Document For Water Quality-based Toxics Control, March 1991, second printing, EPA/505/2-90-001).

Enclosed Bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between headlands or outermost harbor works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. This definition includes but is not limited to: Humboldt Bay, Bodega Harbor, Tomales Bay, Drakes Estero, San Francisco Bay, Morro Bay, Los Angeles Harbor, Upper and Lower Newport Bay, Mission Bay, and San Diego Bay.

Endosulfan shall mean the sum of endosulfan-alpha and -beta and endosulfan sulfate.

Estimated Chemical Concentration is the estimated chemical concentration that results from the confirmed detection of the substance by the analytical method below the ML value.

Estuaries and Coastal Lagoons are waters at the mouths of streams that serve as mixing zones for fresh and ocean waters during a major portion of the year. Mouths of streams that are temporarily separated from the ocean by sandbars shall be considered as estuaries. Estuarine waters will generally be considered to extend from a bay or the open ocean to the upstream limit of tidal action but may be considered to extend seaward if significant mixing of fresh and salt water occurs in the open coastal waters. The waters described by this definition include but are not limited to the Sacramento-San Joaquin Delta as defined by Section 12220 of the California Water Code, Suisun Bay, Carquinez Strait downstream to Carquinez Bridge, and appropriate areas of the Smith, Klamath, Mad, Eel, Noyo, and Russian Rivers.

Halomethanes shall mean the sum of bromoform, bromomethane (methyl bromide) and chloromethane (methyl chloride).

HCH shall mean the sum of the alpha, beta, gamma (lindane) and delta isomers of hexachlorocyclohexane.

Initial Dilution is the process that results in the rapid and irreversible turbulent mixing of wastewater with ocean water around the point of discharge.

For a submerged buoyant discharge, characteristic of most municipal and industrial wastes that are released from the submarine outfalls, the momentum of the discharge and its initial buoyancy act together to produce turbulent mixing. Initial dilution in this case is completed when the diluting wastewater ceases to rise in the water column and first begins to spread horizontally.

For shallow water submerged discharges, surface discharges, and non-buoyant discharges, characteristic of cooling water wastes and some individual discharges, turbulent mixing results primarily from the momentum of discharge. Initial dilution, in these cases, is considered to be completed when the momentum induced velocity of the discharge ceases to produce significant mixing of the waste, or the diluting plume reaches a fixed distance from the discharge to be specified by the Regional Board, whichever results in the lower estimate for initial dilution.

Instantaneous Maximum Effluent Limitation: the highest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous maximum limitation).

Instantaneous Minimum Effluent Limitation: the lowest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous minimum limitation).

Kelp Beds, for purposes of the bacteriological standards of the Ocean Plan, are significant aggregations of marine algae of the genera Macrocystis and Nereocystis. Kelp beds include the total foliage canopy of Macrocystis and Nereocystis plants throughout the water column.

Mariculture is the culture of plants and animals in marine waters independent of any pollution source.

Material: (a) In common usage: (1) the substance or substances of which a thing is made or composed (2) substantial; (b) For purposes of the Ocean Plan relating to waste disposal, dredging and the disposal of dredged material and fill, MATERIAL means matter of any kind or description which is subject to regulation as waste, or any material dredged from the navigable waters of the United States. See also, DREDGED MATERIAL.

Maximum Daily Effluent Limitation (MDEL): the highest allowable daily discharge of a pollutant.

MDL (Method Detection Limit) is the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero, as defined in 40 CFR 136, Appendix B.

Minimum Level (ML) is the concentrations at which the entire analytical system must give a recognizable signal and acceptable calibration point. The ML is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method-specified sample weights, volumes and processing steps have been followed.

Natural Light: Reduction of natural light may be determined by the Central Coast Water Board by measurement of light transmissivity or total irradiance, or both, according to the monitoring needs of the Central Coast Water Board.

Not Detected (ND) are those sample results less than the laboratory's MDL.

Ocean Waters are the territorial marine waters of the state as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. If a discharge outside the territorial waters of the state could affect the quality of the waters of the state, the discharge may be regulated to assure no violation of the Ocean Plan will occur in ocean waters.

PAHs (polynuclear aromatic hydrocarbons) shall mean the sum of acenaphthylene, anthracene, 1,2-benzanthracene, 3,4-benzofluoranthene, benzo[k]fluoranthene, 1,12-benzoperylene, benzo[a]pyrene, chrysene, dibenzo[ah]anthracene, fluorene, indeno[1,2,3-cd]pyrene, phenanthrene and pyrene.

PCBs (polychlorinated biphenyls) shall mean the sum of chlorinated biphenyls whose analytical characteristics resemble those of Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254 and Aroclor-1260.

Persistent pollutants are substances for which degradation or decomposition in the environment is nonexistent or very slow.

Pollutant Minimization Program (PMP) means waste minimization and pollution prevention actions that include, but are not limited to, product substitution, waste stream recycling, alternative waste management methods, and education of the public and businesses. The goal of the PMP shall be to reduce all potential sources of Ocean Plan Table B pollutants through pollutant minimization (control) strategies, including pollution prevention measures as appropriate, to maintain the effluent concentration at or below the water quality-based effluent limitation. Pollution prevention measures may be particularly appropriate for persistent bioaccumulative priority pollutants where there is evidence that beneficial uses are being impacted. The Central Coast Water Board may consider cost effectiveness when establishing the requirements of a PMP. The completion and implementation of a Pollution Prevention Plan, if required pursuant to Water Code section 13263.3(d), shall be considered to fulfill the PMP requirements.

Reporting Level (RL) is the ML (and its associated analytical method) chosen by the Discharger for reporting and compliance determination from the MLs included in this Order. The MLs included in this Order correspond to approved analytical methods for reporting a sample result that are selected by the Central Coast Water Board either from Appendix II of the Ocean Plan in accordance with section III.C.5.a. of the Ocean Plan or established in accordance with section III.C.5.b. of the Ocean Plan. The ML is based on the proper application of method-based analytical procedures for sample preparation and the absence of any matrix interferences. Other factors may be applied to the ML depending on the specific sample preparation steps employed. For example, the treatment typically applied in cases where there are matrix-effects is to dilute the sample or sample aliquot by a factor of ten. In such cases, this additional factor must be applied to the ML in the computation of the reported ML.

Sanitary Sewer Overflow is any overflow, spill, release, discharge, or diversion of untreated or partially treated wastewater from a sanitary sewer system. Sanitary sewer overflows include: (1) overflows or releases of untreated or partially treated wastewater that reach waters of the United States; (2) overflows or releases of untreated or partially treated wastewater that do not reach waters of the United States; and (3) wastewater backups into buildings and on private property that are caused by blockages or flow conditions within the publically owned portion of a sanitary sewer system.

Satellite Collection System is the portion, if any, of a sanitary sewer system owned or operated by a different public agency than the agency that owns and operates the wastewater treatment facility that a sanitary sewer system is tributary to.

Shellfish are organisms identified by the California Department of Health Services as shellfish for public health purposes (i.e., mussels, clams and oysters).

Significant Difference is defined as a statistically significant difference in the means of two distributions of sampling results at the 95 percent confidence level.

Six-month Median Effluent Limitation: the highest allowable moving median of all daily discharges for any 180-day period.

Source of Drinking Water is any water designated as municipal or domestic supply (MUN) in a Regional Water Board Basin Plan.

Standard Deviation (σ) is a measure of variability that is calculated as follows:

$$\sigma = (\sum[(x - \mu)^2]/(n - 1))^{0.5}$$

where:
x is the observed value;
μ is the arithmetic mean of the observed values; and
n is the number of samples.

State Water Quality Protection Areas (SWQPAs) are non-terrestrial marine or estuarine areas designated to protect marine species or biological communities from an undesirable alteration in natural water quality. All AREAS OF SPECIAL BIOLOGICAL SIGNIFICANCE (ASBS) that were previously designated by the State Water Board in Resolution No.s 74-28, 74-32, and 75-61 are now also classified as a subset of State Water Quality Protection Areas and require special protections afforded by the Ocean Plan.

TCDD Equivalents shall mean the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors, as shown in the table below.

Isomer Group	Toxicity Equivalence Factor
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01
octa CDD	0.001
2,3,7,8 tetra CDF	0.1
1,2,3,7,8 penta CDF	0.05
2,3,4,7,8 penta CDF	0.5
2,3,7,8 hexa CDFs	0.1
2,3,7,8 hepta CDFs	0.01
octa CDF	0.001

Toxicity Reduction Evaluation (TRE) is a study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A TOXICITY IDENTIFICATION EVALUATION (TIE) may be required as part of the TRE, if appropriate. (A TIE is a set of procedures to identify the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.)

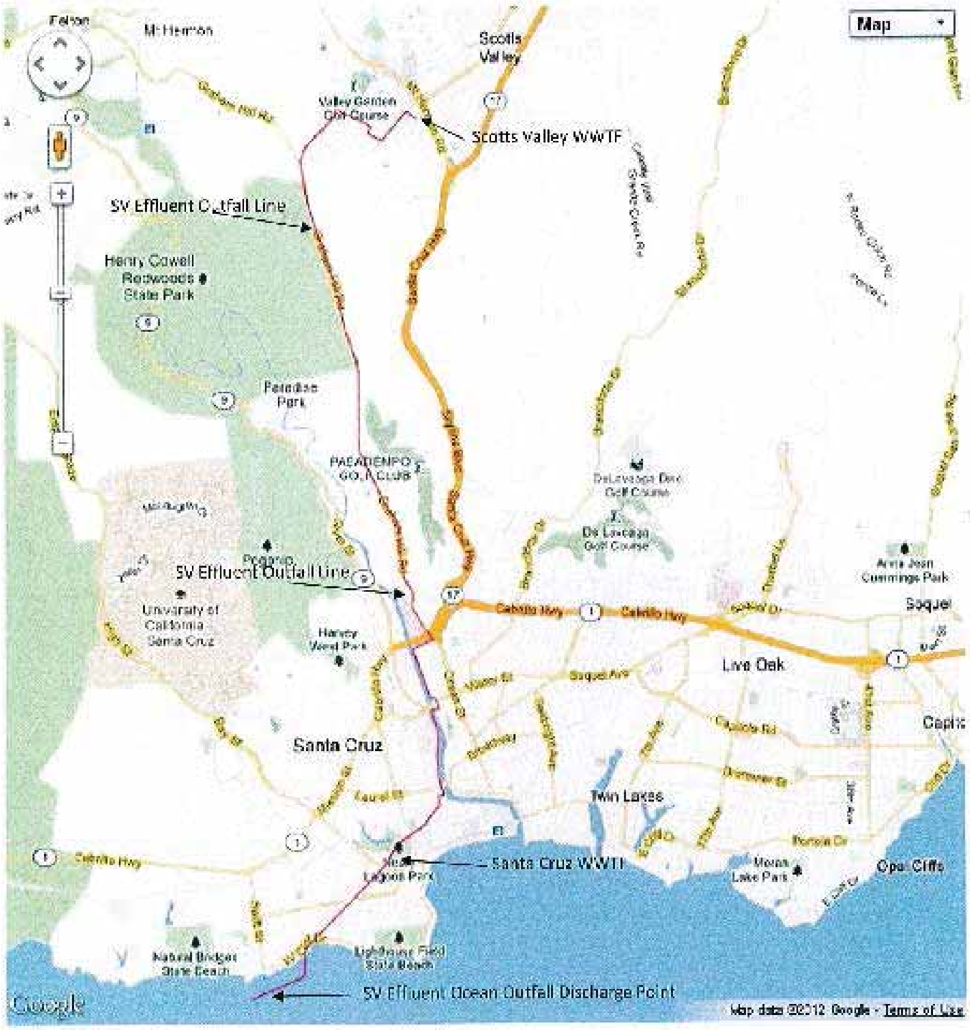
Waste: As used in the Ocean Plan, waste includes a Discharger's total discharge, of whatever origin, i.e., gross, not net, discharge.

Water Reclamation: The treatment of wastewater to render it suitable for reuse, the transportation of treated wastewater to the place of use, and the actual use of treated wastewater for a direct beneficial use or controlled use that would not otherwise occur.

ATTACHMENT B – MAP

Attachment 4

Scotts Valley Ocean Outfall Line

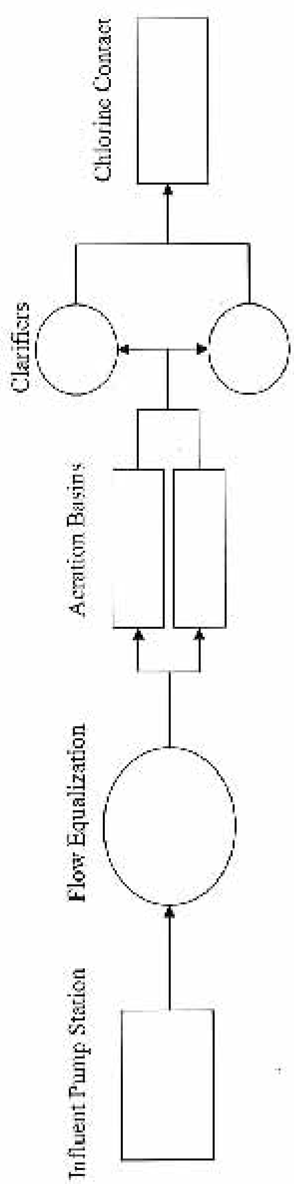


ATTACHMENT C – FLOW SCHEMATIC

Attachment 2

CITY OF SCOTTS VALLEY
WASTEWATER TREATMENT FACILITY

WATER BALANCE



1. Influent Pump Station: Receives and discharges an average daily flow 0.90 MGD.
2. Flow Equalization Basin: Receives flow from influent pump station (0.90 MGD), returned activated sludge (0.60 MGD), and re-circulated #3 process water (0.20 MGD). Total daily throughput approximately 1.65 MGD.
3. Aeration Basins: Receives 100% of flow from flow equalization basin. Total daily throughput approximately 1.65 MGD.
4. Secondary Clarifiers: Receive influent flow of 1.65 MGD from aeration basins. Discharges 0.90 MGD of clarifier effluent to chlorine contact basin and 0.80 MGD to flow equalization basin as returned activated sludge.
5. Chlorine Contact Basin: Receives influent from secondary clarifiers and discharges to City's effluent force main to Santa Cruz for ocean discharge. Total daily throughput approximately 0.90 MGD.

ATTACHMENT D –STANDARD PROVISIONS

I. FEDERAL STANDARD PROVISIONS

A. Federal Standard Provisions – Permit Compliance

1. **Duty to Comply**

   a. The Discharger must comply with all of the conditions of this Order. Any noncompliance constitutes a violation of the Clean Water Act (CWA) and the California Water Code (CWC) and is grounds for enforcement action, permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. [40 CFR §122.41(a)].

   b. The Discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, even if this Order has not yet been modified to incorporate the requirement. [40 CFR §122.41(a)(1)].

2. **Need to Halt or Reduce Activity Not a Defense.** It shall not be a defense for a Discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Order. [40 CFR §122.41(c)].

3. **Duty to Mitigate.** The Discharger shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this Order that has a reasonable likelihood of adversely affecting human health or the environment. [40 CFR §122.41(d)]

4. **Proper Operation and Maintenance.** The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by a Discharger only when necessary to achieve compliance with the conditions of this Order [40 CFR §122.41(e)].

5. **Property Rights**

   a. This Order does not convey any property rights of any sort or any exclusive privileges [40 CFR §122.41(g)].

   b. The issuance of this Order does not authorize any injury to persons or property or invasion of other private rights, or any infringement of state or local law or regulations [40 CFR §122.5(c)].

6. **Inspection and Entry.** The Discharger shall allow the Central Coast Water Board, State Water Board, United States Environmental Protection Agency (USEPA), and/or their authorized representatives (including an authorized contractor acting as their representative), upon the presentation of credentials and other documents, as may be required by law, to [40 CFR §122.41(i); Water Code §13383]:

   a. Enter upon the Discharger's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this Order [40 CFR §122.41(i)(1)];

   b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order [40 CFR §122.41(i)(2)];

   c. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order [40 CFR §122.41(i)(3)]; and

   d. Sample or monitor, at reasonable times, for the purposes of assuring Order compliance or as otherwise authorized by the CWA or the Water Code, any substances or parameters at any location [40 CFR §122.41(i)(4)].

7. **Bypass**

   a. Definitions

      i. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility [40 CFR §122.41(m)(1)(i)].

      ii. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities, which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production [40 CFR §122.41(m)(1)(ii)].

   b. Bypass not exceeding limitations. The Discharger may allow any bypass to occur which does not cause exceedances of effluent limitations, but only if it is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions listed in Federal Standard Provisions – Permit Compliance I.A.7.c, I.A.7.d, and I.A.7.e below [40 CFR §122.41(m)(2)].

   c. Prohibition of bypass. Bypass is prohibited, and the Central Coast Water Board may take enforcement action against a Discharger for bypass, unless [40 CFR §122.41(m)(4)(i)]:

      i. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage [40 CFR §122.41(m)(4)(i)(A)];

      ii. There were no feasible alternatives to the bypass, such as use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance [40 CFR §122.41(m)(4)(i)(B)]; and

iii. The Discharger submitted notice to the Central Coast Water Board as required under Federal Standard Provisions – Permit Compliance I.A.7.e below [40 CFR §122.41(m)(4)(i)(C)].

d. The Central Coast Water Board may approve an anticipated bypass, after considering its adverse effects, if the Central Coast Water Board determines that it will meet the three conditions listed in Federal Standard Provisions – Permit Compliance I.A.7.c above [40 CFR §122.41(m)(4)(ii)].

e. Notice

i. Anticipated bypass. If the Discharger knows in advance of the need for a bypass, it shall submit a notice, if possible at least 10 days before the date of the bypass [40 CFR §122.41(m)(3)(i)].

ii. Unanticipated bypass. The Discharger shall submit notice of an unanticipated bypass as required in Federal Standard Provisions - Reporting I.E.5 below (24-hour notice) [40 CFR §122.41(m)(3)(ii)].

8. **Upset.** Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Discharger. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation [40 CFR **§**122.41(n)(1)].

a. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Federal Standard Provisions – Permit Compliance I.A.8.b below are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review [40 CFR §122.41(n)(2)].

b. Conditions necessary for a demonstration of upset. A Discharger who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence that [40 CFR §122.41(n)(3)]:

i. An upset occurred and that the Discharger can identify the cause(s) of the upset [40 CFR §122.41(n)(3)(i)];

ii. The permitted facility was, at the time, being properly operated [40 CFR §122.41(n)(3)(ii)];

iii. The Discharger submitted notice of the upset as required in Federal Standard Provisions – Reporting I.E.5.b.ii below (24-hour notice) [40 CFR §122.41(n)(3)(iii)]; and

iv. The Discharger complied with any remedial measures required under Federal Standard Provisions – Permit Compliance I.A.3 above [40 CFR §122.41(n)(3)(iv)].

c. Burden of proof. In any enforcement proceeding, the Discharger seeking to establish the occurrence of an upset has the burden of proof [40 CFR §122.41(n)(4)].

B. Federal Standard Provisions – Permit Action

1**. General.** This Order may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any Order condition [40 CFR §122.41(f)].

2**. Duty to Reapply.** If the Discharger wishes to continue an activity regulated by this Order after the expiration date of this Order, the Discharger must apply for and obtain a new permit [40 CFR §122.41(b)].

3. **Transfers.** This Order is not transferable to any person except after notice to the Central Coast Water Board. The Central Coast Water Board may require modification or revocation and reissuance of the Order to change the name of the Discharger and incorporate such other requirements as may be necessary under the CWA and the Water Code [40 CFR §122.41(l)(3); §122.61].

C. Federal Standard Provisions – Monitoring

1. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity [40 CFR §122.41(j)(1)].

2. Monitoring results must be conducted according to test procedures under 40 CFR 136 or, in the case of sludge use or disposal, approved under 40 CFR 136 unless otherwise specified in 40 CFR 503 unless other test procedures have been specified in this Order [40 CFR §122.41(j)(4); §122.44(i)(1)(iv)].

D. Federal Standard Provisions – Records

1. **Records Retention.** Except for records of monitoring information required by this Order related to the Discharger's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR 503), the Discharger shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Central Coast Water Board Executive Officer at any time. (40 CFR §122.41(j)(2).)

2. **Records of monitoring information shall include:**

   a. The date, exact place, and time of sampling or measurements [40 CFR §122.41(j)(3)(i)];

   b. The individual(s) who performed the sampling or measurements [40 CFR §122.41(j)(3)(ii)];

   c. The date(s) analyses were performed [40 CFR §122.41(j)(3)(iii)];

d. The individual(s) who performed the analyses [40 CFR §122.41(j)(3)(iv)];

e. The analytical techniques or methods used [40 CFR §122.41(j)(3)(v)]; and

f. The results of such analyses [40 CFR §122.41(j)(3)(vi)].

3. **Claims of confidentiality for the following information will be denied [40 CFR §122.7(b)]:**

a. The name and address of any permit applicant or Discharger [40 CFR §122.7(b)(1)]; and

b. Permit applications and attachments, permits and effluent data [40 CFR §122.7(b)(2)].

E. Federal Standard Provisions – Reporting

1. **Duty to Provide Information.** The Discharger shall furnish to the Central Coast Water Board, State Water Board, or USEPA within a reasonable time, any information which the Central Coast Water Board, State Water Board, or USEPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order or to determine compliance with this Order. Upon request, the Discharger shall also furnish to the Central Coast Water Board, State Water Board, or USEPA copies of records required to be kept by this Order [40 CFR §122.41(h); Water Code §13267].

2. **Signatory and Certification Requirements**

a. All applications, reports, or information submitted to the Central Coast Water Board, State Water Board, and/or USEPA shall be signed and certified in accordance with Federal Standard Provisions – Reporting I.E.2.b, I.E.2.c, I.E.2.d and I.E.2.e below [40 CFR §122.41(k)].

b. All permit applications shall be signed by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (i) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures [40 CFR §122.22(a)(1)].

c. All reports required by this Order and other information requested by the Central Coast Water Board, State Water Board, or USEPA shall be signed by a person described in Federal Standard Provisions – Reporting I.E.2.b above, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

i. The authorization is made in writing by a person described in Federal Standard Provisions – Reporting I.E.2.b above [40 CFR §122.22(b)(1)];

ii. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR §122.22(b)(2)]; and

iii. The written authorization is submitted to the Central Coast Water Board and State Water Board [40 CFR §122.22(b)(3)].

d. If an authorization under Federal Standard Provisions – Reporting I.E.2.c above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Standard Provisions – Reporting V.B.3 above must be submitted to the Central Coast Water Board and State Water Board prior to or together with any reports, information, or applications, to be signed by an authorized representative [40 CFR §122.22(c)].

e. Any person signing a document under Federal Standard Provisions – Reporting I.E.2.b or I.E.2.c above shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR §122.22(d)].

3. **Monitoring Reports**

a. Monitoring results shall be reported at the intervals specified in the Monitoring and Reporting Program (Attachment E) in this Order [40 CFR §122.41(l)(4)].

b. Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the Central Coast Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices [40 CFR §122.41(l)(4)(i)].

c. If the Discharger monitors any pollutant more frequently than required by this Order using test procedures approved under 40 CFR 136 or, in the case of sludge use or disposal, approved under 40 CFR 136 unless otherwise specified in 40 CFR 503, or as specified in this Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Central Coast Water Board [40 CFR §122.41(l)(4)(ii)].

d. Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this Order [40 CFR §122.41(l)(4)(iii)].

4. **Compliance Schedules.** Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Order, shall be submitted no later than 14 days following each schedule date [40 CFR §122.41(l)(5)].

5. **Twenty-Four Hour Reporting**

    a. The Discharger shall report any noncompliance that may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Discharger becomes aware of the circumstances. A written submission shall also be provided within five (5) days of the time the Discharger becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance [40 CFR §122.41(l)(6)(i)].

    b. The following shall be included as information that must be reported within 24 hours under this paragraph [40 CFR §122.41(l)(6)(ii)]:

        i. Any unanticipated bypass that exceeds any effluent limitation in this Order [40 CFR §122.41(l)(6)(ii)(A)].

        ii. Any upset that exceeds any effluent limitation in this Order [40 CFR §122.41(l)(6)(ii)(B)].

    c. The Central Coast Water Board may waive the above-required written report under this provision on a case-by-case basis if an oral report has been received within 24 hours [40 CFR §122.41(l)(6)(iii)].

6. **Planned Changes.** The Discharger shall give notice to the Central Coast Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required under this provision only when [40 CFR §122.41(l)(1)]:

    a. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in §122.29(b) [40 CFR §122.41(l)(1)(i)]; or

    b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are not subject to effluent limitations in this Order [40 CFR §122.41(l)(1)(ii)].

    c. The alteration or addition results in a significant change in the Discharger's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan [40 CFR §122.41(l)(1)(iii)].

7. **Anticipated Noncompliance.** The Discharger shall give advance notice to the Central Coast Water Board or State Water Board of any planned changes in the permitted facility or activity that may result in noncompliance with General Order requirements. [40 CFR §122.41(l)(2)].

8. **Other Noncompliance.** The Discharger shall report all instances of noncompliance not reported under Federal Standard Provisions – Reporting I.E.3, I.E.4, and I.E.5 above at the time monitoring reports are submitted. The reports shall contain the information listed in Federal Standard Provisions – Reporting I.E.5 above. [40 CFR §122.41(l)(7)].

9. **Other Information.** When the Discharger becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Central Coast Water Board, State Water Board, or USEPA, the Discharger shall promptly submit such facts or information [40 CFR §122.41(l)(8)]

F. Federal Standard Provisions – Enforcement

1. The Central Coast Water Board is authorized to enforce the terms of this permit under several provisions of the Water Code, including, but not limited to, §§13385, 13386, and 13387.

G. Additional Federal Provisions – Notification Levels

1. **Non-Municipal Facilities**. Existing manufacturing, commercial, mining, and silvicultural Dischargers shall notify the Central Coast Water Board as soon as they know or have reason to believe [40 CFR §122.42(a)]:

   a. That any activity has occurred or will occur that would result in the discharge, on a routine or frequent basis, of any toxic pollutant that is not limited in this Order, if that discharge will exceed the highest of the following "notification levels" [40 CFR §122.42(a)(1)]:

      i. 100 micrograms per liter (μg/L) [40 CFR §122.42(a)(1)(i)];

      ii. 200 μg/L for acrolein and acrylonitrile; 500 μg/L for 2,4-dinitrophenol and 2-methyl-4, 6-dinitrophenol; and 1 milligram per liter (mg/L) for antimony [40 CFR §122.42(a)(1)(ii)];

      iii. Five (5) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge [40 CFR §122.42(a)(1)(iii)]; or

      iv. The level established by the Central Coast Water Board in accordance with 40 CFR §122.44(f) [40 CFR §122.42(a)(1)(iv)].

   b. That any activity has occurred or will occur that would result in the discharge, on a non-routine or infrequent basis, of any toxic pollutant that is not limited in this Order, if that discharge will exceed the highest of the following “notification levels" [40 CFR §122.42(a)(2)]:

      i. 500 micrograms per liter (μg/L) [40 CFR §122.42(a)(2)(i)];

      ii. 1 milligram per liter (mg/L) for antimony [40 CFR §122.42(a)(2)(ii)];

      iii. Ten (10) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge [40 CFR §122.42(a)(2)(iii)]; or

iv. The level established by the Central Coast Water Board in accordance with 40 CFR §122.44(f) [40 CFR §122.42(a)(2)(iv)].

2. **Publicly-Owned Treatment Works (POTWs)**. All POTWs shall provide adequate notice to the Central Coast Water Board of the following [40 CFR §122.42(b)]:

   a. Any new introduction of pollutants into the POTW from an indirect discharger that would be subject to sections 301 or 306 of the CWA if it were directly discharging those pollutants [40 CFR §122.42(b)(1)]; and
   b. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of adoption of the Order. [40 CFR §122.42(b)(2)]
   c. Adequate notice shall include information on the quality and quantity of effluent introduced into the POTW as well as any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW. [40 CFR §122.42(b)(3)]

II. CENTRAL COAST REGION'S STANDARD PROVISIONS (DECEMBER 2012)

A. Central Coast Standard Provisions – Prohibitions

1. Introduction of "incompatible wastes" to the treatment system is prohibited.

2. Discharge of high-level radiological waste and of radiological, chemical, and biological warfare agents is prohibited.

3. Discharge of "toxic pollutants" in violation of effluent standards and prohibitions established under §307(a) of the Clean Water Act (CWA) is prohibited.

4. Discharge of sludge, sludge digester or thickener supernatant, and sludge drying bed leachate to drainageways, surface waters, or the ocean is prohibited.

5. Introduction of pollutants into the collection, treatment, or disposal system by an "indirect discharger" that:

   a. Inhibit or disrupt the treatment process, system operation, or the eventual use or disposal of sludge; or,

   b. Flow through the system to the receiving water untreated; and,

   c. Cause or "significantly contribute" to a violation of any requirement of this Order, is prohibited.

6. Introduction of "pollutant free" wastewater to the collection, treatment, and disposal system in amounts that threaten compliance with this order is prohibited.

B. Central Coast Standard Provisions – Provisions

1. Collection, treatment, and discharge of waste shall not create a nuisance or pollution, as defined by California Water Code (CWC) §13050.

2. All facilities used for transport or treatment of wastes shall be adequately protected from inundation and washout as the result of a 100-year frequency flood.

3. Operation of collection, treatment, and disposal systems shall be in a manner that precludes public contact with wastewater.

4. Collected screenings, sludges, and other solids removed from liquid wastes shall be disposed in a manner approved by the Executive Officer.

5. Publicly owned wastewater treatment plants shall be supervised and operated by persons possessing certificates of appropriate grade pursuant to Title 23 of the California Administrative Code.

6. After notice and opportunity for a hearing, this order may be terminated for cause, including, but not limited to:

   a. violation of any term or condition contained in this order;

   b. obtaining this order by misrepresentation, or by failure to disclose fully all relevant facts;

   c. a change in any condition or endangerment to human health or environment that requires a temporary or permanent reduction or elimination of the authorized discharge; and,

   d. a substantial change in character, location, or volume of the discharge.

7. Provisions of this permit are severable. If any provision of the permit is found invalid, the remainder of the permit shall not be affected.

8. After notice and opportunity for hearing, this order may be modified or revoked and reissued for cause, including:

   a. Promulgation of a new or revised effluent standard or limitation;

   b. A material change in character, location, or volume of the discharge;

   c. Access to new information that affects the terms of the permit, including applicable schedules;

   d. Correction of technical mistakes or mistaken interpretations of law; and,

   e. Other causes set forth under Sub-part D of 40 CFR Part 122.

9. Safeguards shall be provided to ensure maximal compliance with all terms and conditions of this permit. Safeguards shall include preventative and contingency plans and may also include alternative power sources, stand-by generators, retention capacity, operating procedures, or other precautions. Preventative and contingency plans for controlling and minimizing the effect of accidental discharges shall:

   a. identify possible situations that could cause "upset", "overflow" or "bypass", or other noncompliance. (Loading and storage areas, power outage, waste treatment unit outage, and failure of process equipment, tanks and pipes should be considered.)

   b. evaluate the effectiveness of present facilities and procedures and describe procedures and steps to minimize or correct any adverse environmental impact resulting from noncompliance with the permit.

10. Physical Facilities shall be designed and constructed according to accepted engineering practice and shall be capable of full compliance with this order when properly operated and maintained. Proper operation and maintenance shall be described in an Operation and Maintenance Manual. Facilities shall be accessible during the wet-weather season.

11. The discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the discharger to achieve compliance with the conditions of this order. Electrical and mechanical equipment shall be maintained in accordance with appropriate practices and standards, such as NFPA 70B, *Recommended Practice for Electrical Equipment Maintenance*; NFPA 70E, *Standard for Electrical Safety in the Workplace*; ANSI/NETA MTS *Standard for Maintenance: Testing Specifications for Electrical Power Equipment and Systems*, or procedures established by insurance companies or other industry resources.

12. If the discharger's facilities are equipped with SCADA or other systems that implement wireless, remote operation, the discharger should implement appropriate safeguards against unauthorized access to the wireless systems. Standards such as NIST SP 800-53, *Recommended Security Controls for Federal Information Systems*, can provide guidance.

13. Production and use of reclaimed water is subject to the approval of the Central Coast Board. Production and use of reclaimed water shall be in conformance with reclamation criteria established in Chapter 3, Title 22, of the California Administrative Code and Chapter 7, Division 7, of the CWC An engineering report pursuant to section 60323, Title 22, of the California Administrative Code is required and a waiver or water reclamation requirements from the Central Coast Board is required before reclaimed water is supplied for any use, or to any user, not specifically identified and approved either in this Order or another order issued by this Board.

C. Central Coast Standard Provisions – General Monitoring Requirements

1. If results of monitoring a pollutant appear to violate effluent limitations based on a weekly, monthly, 30-day, or six-month period, but compliance or non-compliance cannot be validated because sampling is too infrequent, the frequency of sampling shall be increased to validate the test within the next monitoring period. The increased frequency shall be maintained until the Executive Officer agrees the original monitoring frequency may be resumed.

   For example, if copper is monitored annually and results exceed the six-month median numerical effluent limitation in the permit, monitoring of copper must be increased to a frequency of at least once every two months (Central Coast Standard Provisions – Definitions I.G.13.). If suspended solids are monitored weekly and results exceed the weekly average numerical limit in the permit, monitoring of suspended solids must be increased to at least four (4) samples every week (Central Coast Standard Provisions – Definitions I.G.14.).

2. Water quality analyses performed in order to monitor compliance with this permit shall be by a laboratory certified by the State Department of Health Services (DHS) for the constituent(s) being analyzed. Bioassay(s) performed in order to monitor compliance with this permit shall be in accord with guidelines approved by the State Water Resources Control Board (State Water Board) and the State Department of Fish and Game. If the laboratory used or proposed for use by the discharger is not certified by the DHS or, where appropriate, the Department of Fish and Game due to restrictions in the State's laboratory

certification program, the discharger shall be considered in compliance with this provision provided:

a. Data results remain consistent with results of samples analyzed by the Central Coast Water Board;

b. A quality assurance program is used at the laboratory, including a manual containing steps followed in this program that is available for inspections by the staff of the Central Coast Water Board; and,

c. Certification is pursued in good faith and obtained as soon as possible after the program is reinstated.

3. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. Samples shall be taken during periods of peak loading conditions. Influent samples shall be samples collected from the combined flows of all incoming wastes, excluding recycled wastes. Effluent samples shall be samples collected downstream of the last treatment unit and tributary flow and upstream of any mixing with receiving waters.

4. All monitoring instruments and devices used by the discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their continued accuracy.

E. Central Coast Standard Provisions – General Reporting Requirements

1. Reports of marine monitoring surveys conducted to meet receiving water monitoring requirements of the Monitoring and Reporting Program shall include at least the following information:

a. A description of climatic and receiving water characteristics at the time of sampling (weather observations, floating debris, discoloration, wind speed and direction, swell or wave action, time of sampling, tide height, etc.).

b. A description of sampling stations, including differences unique to each station (e.g., station location, grain size, rocks, shell litter, calcareous worm tubes, evident life, etc.).

c. A description of the sampling procedures and preservation sequence used in the survey.

d. A description of the exact method used for laboratory analysis. In general, analysis shall be conducted according to Central Coast Standard Provisions – C.1 above, and Federal Standard Provision – Monitoring III.B. However, variations in procedure are acceptable to accommodate the special requirements of sediment analysis. All such variations must be reported with the test results.

e. A brief discussion of the results of the survey. The discussion shall compare data from the control station with data from the outfall stations. All tabulations and computations shall be explained.

2. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule shall be submitted within 14 days following each scheduled date unless otherwise specified within the permit. If reporting noncompliance, the report shall include a description of the reason, a description and

schedule of tasks necessary to achieve compliance, and an estimated date for achieving full compliance. A second report shall be submitted within 14 days of full compliance.

3. The "Discharger" shall file a report of waste discharge or secure a waiver from the Executive Officer at least 180 days before making any material change or proposed change in the character, location, or plume of the discharge.

4. Within 120 days after the discharger discovers, or is notified by the Central Coast Water Board, that monthly average daily flow will or may reach design capacity of waste treatment and/or disposal facilities within four (4) years, the discharger shall file a written report with the Central Coast Water Board. The report shall include:

   a. the best estimate of when the monthly average daily dry weather flow rate will equal or exceed design capacity; and,

   b. a schedule for studies, design, and other steps needed to provide additional capacity for waste treatment and/or disposal facilities before the waste flow rate equals the capacity of present units.

   In addition to complying with Federal Standard Provision – Reporting V.B., the required technical report shall be prepared with public participation and reviewed, approved and jointly submitted by all planning and building departments having jurisdiction in the area served by the waste collection, treatment, or disposal facilities.

5. All "Dischargers" shall submit reports electronically to the:

   California Regional Water Quality Control Board
   Central Coast Region
   centralcoast@waterboards.ca.gov
   895 Aerovista Place, Suite 101
   San Luis Obispo, CA 93401-7906

   In addition, "Dischargers" with designated major discharges shall submit a copy of each document to:

   Regional Administrator
   USEPA, Region 9
   Attention: CWA Standards and Permits Office (WTR-5)
   75 Hawthorne Street
   San Francisco, California 94105

6. Transfer of control or ownership of a waste discharge facility must be preceded by a notice to the Central Coast Water Board at least 30 days in advance of the proposed transfer date. The notice must include a written agreement between the existing "Discharger" and proposed "Discharger" containing specific date for transfer of responsibility, coverage, and liability between them. Whether a permit may be transferred without modification or revocation and reissuance is at the discretion of the Board. If permit modification or revocation and reissuance is necessary, transfer may be delayed 180 days after the Central Coast Water Board's receipt of a complete permit application. Please also see Federal Standard Provision – Permit Action II.C.

7. Except for data determined to be confidential under CWA §308 (excludes effluent data and permit applications), all reports prepared in accordance with this permit shall be available for

public inspection at the office of the Central Coast Water Board or Regional Administrator of USEPA. Please also see Federal Standard Provision – Records IV.C.

8. By January 30 of each year, the discharger shall submit an annual report to the Central Coast Water Board. The report shall contain the following:

   a) Both tabular and graphical summaries of the monitoring data obtained during the previous year.
   b) A discussion of the previous year's compliance record and corrective actions taken, or which may be needed, to bring the discharger into full compliance.
   c) An evaluation of wastewater flows with projected flow rate increases over time and the estimated date when flows will reach facility capacity.
   d) A discussion of operator certification and a list of current operating personnel and their grades of certification.
   e) The date of the facility's Operation and Maintenance Manual (including contingency plans as described in Provision B.9), the date the manual was last reviewed, and whether the manual is complete and valid for the current facility.
   f) A discussion of the laboratories used by the discharger to monitor compliance with effluent limits and a summary of performance relative to Section C, General Monitoring Requirements.
   g) If the facility treats industrial or domestic wastewater and there is no provision for periodic sludge monitoring in the Monitoring and Reporting Program, the report shall include a summary of sludge quantities, analyses of its chemical and moisture content, and its ultimate destination.
   h) If appropriate, the report shall also evaluate the effectiveness of the local source control or pretreatment program using the State Water Resources Control Board's "Guidelines for Determining the Effectiveness of Local Pretreatment Program."

F. Central Coast Standard Provisions – General Pretreatment Provisions

1. Discharge of pollutants by "indirect dischargers" in specific industrial sub-categories (appendix C, 40 CFR Part 403), where categorical pretreatment standards have been established, or are to be established, (according to 40 CFR Chapter 1, Subchapter N), shall comply with the appropriate pretreatment standards:

   a. By the date specified therein;

   b. Within three (3) years of the effective date specified therein, but in no case later than July 1, 1984; or,

   c. If a new indirect discharger, upon commencement of discharge.

G. Central Coast Standard Provisions – Enforcement

1. Any person failing to file a report of waste discharge or other report as required by this permit shall be subject to a civil penalty not to exceed $5,000 per day.

2. Upon reduction, loss, or failure of the treatment facility, the "Discharger" shall, to the extent necessary to maintain compliance with this permit, control production or all discharges, or both, until the facility is restored or an alternative method of treatment is provided.

H. Central Coast Standard Provisions – Definitions

(Not otherwise included in Attachment A to this Order)

1. A “composite sample" is a combination of no fewer than eight (8) individual samples obtained at equal time intervals (usually hourly) over the specified sampling (composite) period. The volume of each individual sample is proportional to the flow rate at the time of sampling. The period shall be specified in the Monitoring and Reporting Program ordered by the Executive Officer.

2. “Daily Maximum” limit means the maximum acceptable concentration or mass emission rate of a pollutant measured during a calendar day or during any 24-hour period reasonably representative of the calendar day for purposes of sampling. It is normally compared with results based on "composite samples” except for ammonia, total chlorine, phenolic compounds, and toxicity concentration. For all exceptions, comparisons will be made with results from a “grab sample”.

3. “Discharger", as used herein, means, as appropriate: (1) the Discharger, (2) the local sewering entity (when the collection system is not owned and operated by the Discharger), or (3) "indirect discharger" (where "Discharger" appears in the same paragraph as "indirect discharger”, it refers to the discharger.)

4. “Duly Authorized Representative" is one where:

   a. the authorization is made in writing by a person described in the signatory paragraph of Federal Standard Provision V.B.;

   b. the authorization specifies either an individual or the occupant of a position having either responsibility for the overall operation of the regulated facility, such as the plant manager, or overall responsibility for environmental matters of the company; and,

   c. the written authorization was submitted to the Central Coast Water Board.

5. A "grab sample" is defined as any individual sample collected in less than 15 minutes. "Grab samples” shall be collected during peak loading conditions, which may or may not be during hydraulic peaks. It is used primarily in determining compliance with the daily maximum limits identified in Central Coast Standard Provision – Provision G.2. and instantaneous maximum limits.

6. "Hazardous substance” means any substance designated under 40 CFR Part 116 pursuant to Section 311 of the Clean Water Act.

7. "Incompatible wastes” are:

   a. Wastes which create a fire or explosion hazard in the treatment works;

   b. Wastes which will cause corrosive structural damage to treatment works, but in no case wastes with a pH lower than 5.0 unless the works is specifically designed to accommodate such wastes;

   c. Solid or viscous wastes in amounts which cause obstruction to flow in sewers, or which cause other interference with proper operation of treatment works;

d. Any waste, including oxygen demanding pollutants (BOD, etc), released in such volume or strength as to cause inhibition or disruption in the treatment works and subsequent treatment process upset and loss of treatment efficiency; and,

e. Heat in amounts that inhibit or disrupt biological activity in the treatment works or that raise influent temperatures above 40°C (104°F) unless the treatment works is designed to accommodate such heat.

8. "Indirect Discharger" means a non-domestic discharger introducing pollutants into a publicly owned treatment and disposal system.

9. "Log Mean" is the geometric mean. Used for determining compliance of fecal or total coliform populations, it is calculated with the following equation:

   Log Mean = (C1 x C2 x...x Cn)1/n,

   in which "n" is the number of days samples were analyzed during the period and any "C" is the concentration of bacteria (MPN/100 ml) found on each day of sampling. "n" should be five or more.

10. "Mass emission rate" is a daily rate defined by the following equations:

    mass emission rate (lbs/day) = 8.34 x Q x C; and,

    mass emission rate (kg/day) = 3.79 x Q x C,

    where "C" (in mg/L) is the measured daily constituent concentration or the average of measured daily constituent concentrations and "Q" (in MGD) is the measured daily flowrate or the average of measured daily flowrates over the period of interest.

11. The "Maximum Allowable Mass Emission Rate," whether for a month, week, day, or six-month period, is a daily rate determined with the formulas in paragraph G.10, above, using the effluent concentration limit specified in the permit for the period and the average of measured daily flows (up to the allowable flow) over the period.

12. "Maximum Allowable Six-Month Median Mass Emission Rate" is a daily rate determined with the formulas in Central Coast Standard Provision – Provision G.10, above, using the "six-month Median" effluent limit specified in the permit, and the average of measured daily flows (up to the allowable flow) over a 180-day period.

13. "Median" is the value below which half the samples (ranked progressively by increasing value) fall. It may be considered the middle value, or the average of two middle values.

14. "Monthly Average" (or "Weekly Average", as the case may be) is the arithmetic mean of daily concentrations or of daily mass emission rates over the specified 30-day (or 7-day) period.

    Average = (X1 + X2 + ... + Xn) / n

    in which "n" is the number of days samples were analyzed during the period and "X" is either the constituent concentration (mg/l) or mass emission rate (kg/day or lbs/day) for each sampled day. "n" should be four or greater.

15. "Municipality" means a city, town, borough, county, district, association, or other public body created by or under State law and having jurisdiction over disposal of sewage, industrial waste, or other waste.

16. "Overflow" means the intentional or unintentional diversion of flow from the collection and transport systems, including pumping facilities.

17. "Pollutant-free wastewater" means inflow and infiltration, stormwaters, and cooling waters and condensates which are essentially free of pollutants.

18. "Primary Industry Category" means any industry category listed in 40 CFR Part 122, Appendix A.

19. "Removal Efficiency" is the ratio of pollutants removed by the treatment unit to pollutants entering the treatment unit. Removal efficiencies of a treatment plant shall be determined using “Monthly averages" of pollutant concentrations (C, in mg/l) of influent and effluent samples collected about the same time and the following equation (or its equivalent):

    $C_{Effluent}$ Removal Efficiency (%) = 100 x (1 – $C_{effluent}$ / $C_{influent}$)

20. "Severe property damage" means substantial physical damage to property, damage to treatment facilities which causes them to become inoperable, or substantial and permanent loss to natural resources which can reasonably be expected to occur in the absence of a "bypass”. It does not mean economic loss caused by delays in production.

21. "Sludge" means the solids, residues, and precipitates separated from, or created in, wastewater by the unit processes of a treatment system.

22. To "significantly contribute" to a permit violation means an "indirect discharger" must:

    a. Discharge a daily pollutant loading in excess of that allowed by contract with the "Discharger" or by Federal, State, or Local law;

    b. Discharge wastewater which substantially differs in nature or constituents from its average discharge;

    c. Discharge pollutants, either alone or in conjunction with discharges from other sources, which results in a permit violation or prevents sewage sludge use or disposal; or

    d. Discharge pollutants, either alone or in conjunction with pollutants from other sources that increase the magnitude or duration of permit violations.

23. "Toxic Pollutant" means any pollutant listed as toxic under Section 307 (a) (1) of the Clean Water Act or under 40 CFR Part 122, Appendix D. Violation of maximum daily discharge limitations are subject to 24-hour reporting (Federal Standard Provisions V.E.).

24. “Zone of Initial Dilution" means the region surrounding or adjacent to the end of an outfall pipe or diffuser ports whose boundaries are defined through calculation of a plume model verified by the State Water Board.

ATTACHMENT E – MONITORING AND REPORTING PROGRAM

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ATTACHMENT E – MONITORING AND REPORTING PROGRAM (MRP)

The Code of Federal Regulations (CFR) §122.48 require that all NPDES permits specify monitoring and reporting requirements. Water Code §13267 and §13383 also authorize the Central Coast Water Board to require technical and monitoring reports. This MRP establishes monitoring and reporting requirements, which implement the federal and California regulations.

I. GENERAL MONITORING PROVISIONS

A. Laboratories analyzing monitoring samples shall be certified by the California Department of Public Health, in accordance with Water Code §13176, and must include quality assurance/quality control data with their reports.

B. Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring locations specified below and, unless otherwise specified, before the monitored flow joins or is diluted by any other waste stream, body of water, or substance. Monitoring locations shall not be changed without notification to and approval of the Central Coast Water Board.

C. Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated, and maintained to ensure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than ±10 percent from true discharge rates throughout the range of expected discharge volumes. Guidance in selection, installation, calibration, and operation of acceptable flow measurement devices can be obtained from the following references.

1. *A Guide to Methods and Standards for the Measurement of Water Flow, U.S. Department of Commerce, National Bureau of Standards*, NBS Special Publication 421, May 1975, 96 pp. (Available from the U.S. Government Printing Office, Washington, D.C. 20402. Order by SD Catalog No. C13.10:421.)

2. *Water Measurement Manual, U.S. Department of Interior, Bureau of Reclamation, Second Edition, Revised Reprint*, 1974, 327 pp. (Available from the U.S. Government Printing Office, Washington D.C. 20402. Order by Catalog No. 172.19/2:W29/2, Stock No. S/N 24003-0027.)

3. *Flow Measurement in Open Channels and Closed Conduits, U.S. Department of Commerce, National Bureau of Standards*, NBS Special Publication 484, October 1977, 982 pp. (Available in paper copy or microfiche from National Technical Information Services (NTIS) Springfield, VA 22151. Order by NTIS No. PB-273 535/5ST.)

4. *NPDES Compliance Sampling Manual, U.S. Environmental Protection Agency, Office of Water Enforcement*, Publication MCD-51, 1977, 140 pp. (Available from the General Services Administration (8FFS), Centralized Mailing Lists Services, Building 41, Denver Federal Center, CO 80225.)

D. All monitoring instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their continued accuracy. All flow measurement devices shall be calibrated at least once per year to ensure continued accuracy of the devices.

E. Monitoring results, including noncompliance, shall be reported at intervals and in a manner specified in this MRP.

F. Unless otherwise specified by this MRP, all monitoring shall be conducted according to test procedures established at 40 CFR 136, *Guidelines Establishing Test Procedures for Analysis of Pollutants*. All analyses shall be conducted using the lowest practical quantitation limit achievable using the specified methodology. Where effluent limitations are set below the lowest achievable quantitation limits, pollutants not detected at the lowest practical quantitation limits will be considered in compliance with effluent limitations. Analysis for toxics listed by the California Toxics Rule shall also adhere to guidance and requirements contained in the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (2005). Analyses for toxics listed in Table B of the California Ocean Plan (2009) shall adhere to guidance and requirements contained in that document.

II. MONITORING LOCATIONS

The Discharger shall establish the following monitoring locations to demonstrate compliance with the effluent limitations, discharge specifications, and other requirements in this Order:

Table E-1. Monitoring Station Locations

Discharge Point	Monitoring Location Name	Monitoring Location Description
---	INF-001	Influent wastewater prior to treatment and following all significant inputs to the collection system or to the headworks of untreated wastewater where representative samples of wastewater influent can be obtained.
001	EFF-001	Location where representative effluent sample can be collected after treatment.

III. INFLUENT MONITORING REQUIREMENTS

A. Monitoring Location INF - 001

1. The Discharger shall monitor the untreated wastewater at Monitoring Location INF – 001 as follows:

Table E-2. Influent Monitoring at INF-001

Parameter	Units	Sample Type	Minimum Sampling Frequency
Daily Flow	MGD	Metered	Daily
Maximum Daily Flow	MGD	Metered	Daily
Mean Daily Flow	MGD	Calculated	Monthly
BOD_5	mg/L	24-hr Composite	Weekly
TSS	mg/L	24-hr Composite	Weekly

IV. EFFLUENT MONITORING REQUIREMENTS

A. Monitoring Location EFF - 001

1. The Discharger shall monitor effluent discharged at Discharge Point 001 at Monitoring Location EFF – 001 as follows:

Table E-3. Effluent Monitoring at EFF - 001

Parameter	Units	Sample Type	Minimum Sampling Frequency
Daily Flow	MGD	Metered	Daily
Maximum Daily Flow	MGD	Metered	Daily
Mean Daily Flow	MGD	Calculated	Monthly
pH	pH units	Metered	Weekly
Total & Fecal Coliform Bacteria [1]	MPN/100mL	Grab	Weekly [2]
Enterococci Bacteria [3]	MPN/100mL	Grab	Weekly [2]
$CBOD_5$	mg/L	24-hr Composite	Weekly
TSS	mg/L	24-hr Composite	Weekly
Settleable Solids	mL/L/hr	Grab	Weekly
Chlorine Residual [4]	mg/L	Continuous	Daily
Turbidity	NTUs	Grab	Monthly
Oil and Grease	mg/L	Grab	Monthly
Acute Toxicity [5]	TUa	24-hr composite	Quarterly (Jan, Apr, Jul, Oct)
Chronic Toxicity [5]	TUc	24-hr composite	Quarterly (Jan, Apr, Jul, Oct)
Ocean Plan Table B Metals [6], [7]	µg/L	HVWS [8]	Once per permit term
Ocean Plan Table B pollutants [9], [7]	µg/L	HVWS [8]	Once per permit term

[1] Detection methods used for coliforms (total and fecal) shall be those presented in Table 1A of 40 CFR Part 136 (revised edition of May 14, 1999), unless alternate methods have been approved in advance by USEPA pursuant to 40 CFR Part 136.

[2] Bacteria monitoring of effluent samples is required if the Executive Officer concludes from receiving water monitoring that the discharge consistently exceeds the receiving water limitation established in section V.A.1 of the Order.

[3] Detection methods used for enterococcus shall be those presented in USEPA publication EPA 600/4-85/076, Test Methods for Escherichia coli and Enterococci in Water by Membrane Filter Procedure, or any improved method determined by the Central Coast Water Board to be appropriate.

[4] The Discharger shall monitor effluent continuously for chlorine residual at any point after dechlorination and before the discharge combines with the City of Santa Cruz's discharge. The Discharger shall review the continuous monitoring strip charts and submit a summary of the daily range and daily average concentrations to the Executive Officer with monthly monitoring reports.

[5] Whole effluent, acute and chronic toxicity monitoring shall be conducted according to the requirements established in section V. of this Monitoring and Reporting Program.

[6] Those twelve metals (Sb, As, Cd, Cr^{+3}, Cr^{+6}, Cu, Pg, Hg, Ni, Se, Ag, and Zn) with applicable water quality objectives established by Table B of the Ocean Plan. Analysis shall be for total recoverable metals.

[7] Procedures, calibration techniques, and instrument/reagent specifications shall conform to 40 CFR 136 and applicable provisions of the Ocean Plan, including the Standard Monitoring Procedures presented in Appendix III of the Ocean Plan. The Discharger shall instruct its analytical laboratory to establish calibration standards so that the Minimum Levels (MLs) presented in Appendix II of the Ocean Plan are the lowest calibration standards. The Discharger and its analytical laboratory shall select MLs, which are below applicable water quality criteria of Table B; and when applicable water quality criteria are below all MLs, the Discharger and its analytical laboratory shall select the lowest ML. In addition, data must comply with QA/QC requirements of 40 CFR 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR 136.

[8] HVWS = High-volume water sampling

[9] Those pollutants in 2009 Ocean Plan Table B. Analyses, compliance determination, and reporting shall adhere to applicable provisions of the Ocean Plan, including the Standard Monitoring Procedures presented in Appendix III. The Discharger shall ensure its analytical laboratory uses the Minimum Levels (MLs) presented in Ocean Plan Appendix II as the lowest calibration standards. The Discharger shall select the

lowest ML necessary to demonstrate compliance with effluent limitations. If effluent limitations are less than the lowest MLD, then the Discharger shall use the lowest ML.

V. WHOLE EFFLUENT TOXICITY TESTING REQUIREMENTS

A. Acute Toxicity

Compliance with acute toxicity objective shall be determined using a U.S. EPA approved protocol as provided in 40 CFR 136 (*Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, Fifth Edition, October 2002, U.S. EPA Office of Water, EPA-821-R-02-012 or the latest edition).

Acute Toxicity (TUa) = 100/96-hr LC 50.

LC 50 (percent waste giving 50% survival of test organisms) shall be determined by 96-hour static or continuous flow bioassay techniques using standard marine test species as specified in EPA-821-R-02-012 and as noted in the following table.

Table E-4. Approved Test - Acute Toxicity (TUa)

Species	Scientific Name	Effect	Test Duration
shrimp	*Holmesimysis costata*	survival	48 or 96 hours
shrimp	*Mysidopsis bahia*	survival	48 or 96 hours
silversides	*Menidia beryllina*	survival	48 or 96 hours
sheepshead minnow	*Cyprinodon variegatus*	survival	48 or 96 hours

If the effluent is to be discharged to a marine or estuarine system (e.g., salinity values in excess of 1,000 mg/L) and originates from a freshwater supply, salinity of the effluent must be increased with dry ocean salts (e.g., FORTY FATHOMS®) to match salinity of the receiving water. This modified effluent shall then be tested using marine species.

Reference toxicant test results shall be submitted with the effluent sample test results. Both tests must satisfy the test acceptability criteria specified in EPA-821-R-02-012. If the test acceptability criteria are not achieved or if toxicity is detected, the sample shall be retaken and retested within 5 days of the failed sampling event. The retest results shall be reported in accordance with EPA-821-R-02-012 (chapter on report preparation) and the results shall be attached to the next monitoring report.

When it is not possible to measure the 96-hour LC 50 due to greater than 50 percent survival of the test species in 100 percent waste, the toxicity concentration shall be calculated by the expression:

$$TUa = [\log(100 - S)]/1.7$$

where S = percentage survival in 100% waste. If S > 99, TUa shall be reported as zero.

When toxicity monitoring finds acute toxicity in the effluent above the effluent limitation established by the Order, the Discharger shall immediately resample the effluent, if the discharge is continuing, and retest for acute toxicity. Results of the initial failed test and any toxicity monitoring results subsequent to the failed test shall be reported as soon as reasonable to the Executive Officer (EO). The EO will determine whether to initiate enforcement action, whether to require the Discharger to implement toxicity reduction evaluation (TRE) requirements (section VI.C.2.a of the Order), or to implement other measures.

B. Chronic Toxicity

The presence of chronic toxicity shall be estimated as specified in *Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms*, EPA-821/600/R-95/136; *Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms*, EPA-600-4-91-003; *Procedures Manual for Conducting Toxicity Tests developed by the Marine Bioassay Project*, SWRCB 1996, 96-1WQ; and/or *Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms*, EPA/600/4-87-028 or subsequent editions.

Chronic toxicity measures a sublethal effect (e.g., reduced growth or reproduction) to experimental test organisms exposed to an effluent compared to that of the control organisms.

Chronic Toxicity (TUc) = 100/NOEL.

The no observed effect level (NOEL) is the maximum tested concentration in a medium which does not cause known adverse effects upon chronic exposure in the species in question (i.e., the highest effluent concentration to which organisms are exposed in a chronic test that causes no observable adverse effects on the test organisms; e.g., the highest concentration of a toxicant to which the values for the observed responses are not statistically significantly different from the controls). Examples of chronic toxicity include but are not limited to measurements of toxicant effects on reproduction, growth, and sublethal effects that can include behavioral, physiological, and biochemical effects.

In accordance with the 2009 Ocean Plan, Appendix III, *Standard Monitoring Procedures*, the Discharger shall use the critical life stage toxicity tests specified in the table below to measure TUc. Other species or protocols will be added to the list after State Water Resources Control Board review and approval.

A minimum of three test species with approved test protocols shall be used to measure compliance with the toxicity limitation. If possible, the test species shall include a fish, an invertebrate, and an aquatic plant. After a screening period of no fewer than three sampling events, monitoring can be reduced to the most sensitive species. The sensitivity of the test organisms to a reference toxicant shall be determined concurrently with each bioassay test and reported with the test results.

Table E-5. Approved Tests—Chronic Toxicity

Species	Test	Tier [1]	Reference [2]
Giant kelp, *Macrocystis pyrifera*	percent germination; germ tube length	1	a, c
Red abalone, *Haliotis rufescens*	abnormal shell development	1	a, c
Oyster, *Crassostrea gigas*; mussels, *Mytilus spp*.	abnormal shell development; percent survival	1	a, c
Urchin, *Strongylocentrotus purpuratus*; sand dollar, *Dendraster excentricus*	percent normal development	1	a, c
Urchin, *Strongylocentrotus purpuratus*; sand dollar, *Dendraster excentricus*	percent fertilization	1	a, c
Shrimp, *Homesimysis costata*	percent survival; growth	1	a, c

Shrimp, *Mysidopsis bahia*	percent survival; fecundity	2	b, d
Topsmelt, *Atherinops affinis*	larval growth rate; percent survival	1	a, c
Silverside, *Menidia beryllina*	larval growth rate; percent survival	2	b, d

[1] First tier methods are preferred for compliance monitoring. If first tier organisms are not available, the Discharger can use a second tier test method following approval by the Central Coast Water Board.

[2] Protocol References:

a. Chapman, G.A., D.L. Denton, and J.M. Lazorchak. 1995. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms. U.S. EPA Report No. EPA/600/R-95/136.

b. Klemm, D.J., G.E. Morrison, T.J. Norberg-King, W.J. Peltier, and M.A. Heber. 1994. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Marine and Estuarine Organisms. U.S. EPA Report No. EPA-600-4-91-003.

c. SWRCB 1996. Procedures Manual for Conducting Toxicity Tests Developed by the Marine Bioassay Project. 96-1WQ.

d. Weber, C.I., W.B. Horning, I.I., D.J. Klemm, T.W. Nieheisel, P.A. Lewis, E.L. Robinson, J. Menkedick and F. Kessler (eds). 1998. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms. EPA/600/4-87/028. National Information Service, Springfield, VA.

Dilution and control waters shall be obtained from an area of the receiving waters, typically upstream, which is unaffected by the discharge. Standard dilution water can be used, if the receiving water itself exhibits toxicity or if approved by the Central Coast Water Board. If the dilution water used in testing is different from the water in which the test organisms were cultured, a second control sample using culture water shall be tested.

If the effluent is to be discharged to a marine or estuarine system (e.g., salinity values in excess of 1,000 mg/L) originates from a freshwater supply, salinity of the effluent must be increased with dry ocean salts (e.g., FORTY FATHOMS®) to match salinity of the receiving water. This modified effluent shall then be tested using marine species.

If chronic toxicity is measured in the effluent above 115 TUc, the Discharger shall re-sample and submit the results to the Central Coast Water Board as described in section VI.C.2.a of this Order.

C. Toxicity Reporting

1. The Discharger shall include a full report of toxicity test results with the regular monthly monitoring report and include the following information.

   a. Toxicity test results,

   b. Dates of sample collection and initiation of each toxicity test, and

   c. Acute and/or chronic toxicity discharge limitations (or value).

2. Toxicity test results shall be reported according to the appropriate guidance - *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, Fifth Edition, U.S. EPA Office of Water, EPA-821-R-02-012 (2002) or the latest edition, or *Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, EPA-821-R-02-012 (2002) or subsequent editions.

3. If the initial investigation TRE workplan is used to determine that additional (accelerated) toxicity testing is unnecessary, these results shall be submitted with the monitoring report for the month in which investigations conducted under the TRE workplan occurred.

4. Within 30 days of receipt of test results exceeding an acute or chronic toxicity discharge limitation, the Discharger shall provide written notification to the Executive Officer of:

   a. Findings of the TRE or other investigation to identify the cause(s) of toxicity, and

   b. Actions the Discharger has taken/will take, to mitigate the impact of the discharge and to prevent the recurrence of toxicity.

   When corrective actions, including a TRE, have not been completed, a schedule under which corrective actions will be implemented, or the reason for not taking corrective action, if no action has been taken.

VI. LAND DISCHARGE MONITORING REQUIREMENTS – NOT APPLICABLE

VII. RECLAMATION MONITORING REQUIREMENTS

The Discharger shall comply with applicable state and local requirements regarding the production and use of reclaimed wastewater, including requirements of California Water Code (CWC) sections 13500 – 13577 (Water Reclamation) and Department of Public Health regulations at title 22, sections 60301 – 60357 of the California Code of Regulations (Water Recycling Criteria).

VIII. RECEIVING WATER MONITORING REQUIREMENTS – SURFACE WATER

In accordance with WDRs Order No. R3-2010-0043 (NPDES No. CA0048194), the City of Santa Cruz monitors the effects of its discharge combined with the Discharger's into the Pacific Ocean and the Monterey Bay National Marine Sanctuary.

IX. OTHER MONITORING REQUIREMENTS

A. Solids/Biosolids Monitoring, Notification, and Reporting

1. Biosolids Monitoring

   a. Biosolids shall be tested for the metals required in 40 CFR 503.16 (for land application) or Section 503.26 (for surface disposal), using the methods in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846), as required in 503.8(b)(4), at the following minimum frequencies:

Volume (dry metric tons) [1]	Sampling and Analysis Frequency [2]
0-290	Once per year
290-1500	Once per quarter
1500-15000	Once per 60 days
> 15000	Once per month

[1] For accumulated, previously untested biosolids, the Permittee shall develop a representative sampling plan, including number and location of sampling points, and collect representative samples.

[2] Test results shall be expressed in mg pollutant per kg biosolids on a 100% dry weight basis. Biosolids to be land applied shall be tested for organic-N, ammonium-N, and nitrate-N at the frequencies required above.

b. Prior to land application, the Permittee shall demonstrate that the biosolids meet Class A or Class B pathogen reduction levels by one of the methods listed in 40 CFR 503.32. Prior to disposal in a surface disposal site, the Permittee shall demonstrate that the biosolids meet Class B levels or shall ensure that the site is covered at the end of each operating day. If pathogen reduction is demonstrated using a "Process to Significantly/Further Reduce Pathogens", the Permittee shall maintain daily records of the operating parameters used to achieve this reduction. If pathogen reduction is demonstrated by testing for fecal coliforms and/or pathogens, samples must be drawn at the frequency in 1(a) above. For fecal coliform, at least seven grab samples must be drawn during each monitoring event and a geometric mean calculated from these seven samples.

c. For biosolids that are land applied or placed in a surface disposal site, the Permittee shall track and keep records of the operational parameters used to achieve Vector Attraction Reduction requirements in 40 CFR 503.33(b).

d. Class 1 facilities (facilities with pretreatment programs or others designated as Class 1 by the Regional Administrator) and Federal facilities with greater than five million gallons per day (MGD) influent flow shall sample biosolids for pollutants listed under Section 307(a) of the Clean Water Act (as required in the pretreatment section of the permit for POTW's with pretreatment programs). Class 1 facilities and Federal facilities greater than five MGD shall test dioxins/dibenzofurans using a detection limit of less than one pg/g at the time of their next priority pollutant scan if they have not done so within the past five years, and once per five years thereafter.

e. The biosolids shall be tested annually, or more frequently if necessary, to determine hazardousness in accordance 40 CFR 261.

f. If biosolids are placed in a surface disposal site (dedicated land disposal site or monofill), a qualified groundwater scientist shall develop a groundwater monitoring program for the site, or shall certify that the placement of biosolids on the site will not contaminate an aquifer.

g. Biosolids placed in a municipal landfill shall be tested by the Paint Filter Liquids Test (EPA Method 9095) at the frequency in 11 (a) above or more often if necessary to demonstrate that there are no free liquids.

2. Solids/Biosolids Monitoring

The Permittee, either directly or through contractual arrangements with their biosolids management contractors, shall comply with the following notification requirements:

a. Notification of non-compliance: The Permittee shall notify USEPA Region 9, the State Water Board, and the Regional Board located in the region where the biosolids are used or disposed, of any non-compliance within 24 hours if the non-compliance may seriously endanger health or the environment. For other instances of non-compliance, the Permittee shall notify USEPA Region 9 and the affected Regional Boards of the non-compliance in writing within five working days of becoming aware of the non-compliance. The Permittee shall require their biosolids management contractors to notify USEPA Region 9 and the affected Regional Boards of any non-compliance within the same timeframes. See Attachment C for Regional Board contact information.

b. If biosolids are shipped to another State or to Indian Lands, the Permittee must send 60 days prior notice of the shipment to the permitting authorities in the receiving State or Indian Land (the USEPA Regional Office for that area and the State/Indian authorities).

c. For land application: Prior to reuse of any biosolids from this facility to a new or previously unreported site, the Permittee shall notify USEPA and Regional Board. The notification shall include a description and topographic map of the proposed site(s), names and addresses of the applier, and site owner and a listing of any state or local permits which must be obtained. The plan shall include a description of the crops or vegetation to be grown, proposed loading rates and determination of agronomic rates. If any biosolids within a given monitoring period do not meet 40 CFR 503.13 metals concentration limits, the Permittee (or its contractor) must pre-notify USEPA, and determine the cumulative metals loading at that site to date, as required in Section 503.12.

d. The Permittee shall notify the applier of all the applier's requirements under 40 CFR 503, including the requirement that the applier certify that the management practices, site restrictions, and any applicable vector attraction reduction requirements have been met. The Permittee shall require the applier to certify at the end of 38 months following application of Class B biosolids that the harvesting restrictions in effect for up to 38 months have been met.

e. For surface disposal: Prior to disposal to a new or previously unreported site, the Permittee shall notify USEPA and the Regional Board. The notice shall include description and topographic map of the proposed site, depth to groundwater, whether the site is lined or unlined, site operator, site owner, and any state or local permits. The notice shall describe procedures for ensuring public access and grazing restrictions for three years following site closure. The notice shall include a groundwater monitoring plan or description of why groundwater monitoring is not required.

3. Biosolids Reporting

The Permittee shall submit an annual biosolids report to the USEPA Region 9 Biosolids Coordinator and Regional Board by February 19 of each year for the period covering the previous calendar year. The report shall include:

a. The amount of biosolids generated during the reporting period, in dry metric tons, and the amount accumulated from previous years;

b. Results of all pollutant and pathogen monitoring required in Item 12 above and the Monitoring and Reporting Program of this Order. Results must be reported on a 100% dry weight basis for comparison with 40 CFR 503 limits;

c. Descriptions of pathogen reduction methods and vector attraction reduction methods, including supporting time and temperature data, and certifications, as required in 40 CFR 503.17 and 503.27;

d. Names, mailing addresses, and street addresses of persons who received biosolids for storage, further treatment, disposal in a municipal waste landfill, or for other use or disposal methods not covered above, and volumes delivered to each.

e. For land application sites, the following information must be submitted by the Permittee, unless the Permittee requires its biosolids management contractors to report this information directly to the USEPA Region 9 Biosolids Coordinator:

   1) Locations of land application sites (with field names and numbers) used that calendar year, size of each field applied to, applier, and site owner.
   2) Volumes applied to each filed (in wet tons and dry metric tons), nitrogen applied, calculated plant available nitrogen;
   3) Crop planted, dates of planting and harvesting;
   4) For any biosolids exceeding 40 CFR 503.13 Table 3 metals concentrations: the locations of sites where applied and cumulative metals loading at that site to date;
   5) Certifications of management practices in Section 503.14; and
   6) Certifications of site restrictions in Section 503(b)(5).

f. For surface disposal sites:

   1) Locations of sites, site operator, site owner, size of parcel on which disposed;
   2) Results of any required groundwater monitoring;
   3) Certifications of management practices in Section 503.24; and
   4) For closed sites, date of site closure and certifications of management practices for the three years following site closure.

g. For all biosolids used or disposed at the Permittee's facilities, the site and management practice information and certification required in Sections 503.17 and 503.27; and

h. For all biosolids temporarily stored, the information required in Section 503.20 required to demonstrate temporary storage.

   Reports shall be submitted to:

   Regional Biosolids Coordinator
   USEPA (WTR-7)
   75 Hawthorne Street
   San Francisco, CA 94105-3901

   Executive Officer
   Central Coast Water Board
   centralcoast@waterboards.ca.gov

i. All the requirements of 40 CFR 503 and 23 CCR 15 are enforceable by the USEPA and this Regional Board whether or not the requirements are stated in an NPDES permit or any other permit issued to the discharger.

X. REPORTING REQUIREMENTS

A. General Monitoring and Reporting Requirements

1. The Discharger shall comply with all Federal and Central Coast Water Board Standard Provisions (Attachment D) related to monitoring, reporting, and recordkeeping.

B. Self Monitoring Reports (SMRs)

1. The Discharger must electronically submit Self-Monitoring Reports (SMRs) using the State Water Board's California Integrated Water Quality System (CIWQS) Program Web site (http://www.waterboards.ca.gov/ciwqs/index.html). The CIWQS Web site will provide additional directions for SMR submittal in the event there will be service interruption for electronic submittal.

2. The Discharger shall report in the SMR the results for all monitoring specified in this MRP under sections III through IX. The Discharger shall submit monthly and annual SMRs including the results of all required monitoring using USEPA-approved test methods or other test methods specified in this Order. If the Discharger monitors any pollutant more frequently than required by this Order, the results of this monitoring shall be included in the calculations and reporting of the data submitted in the SMR.

3. Monitoring periods and reporting for all required monitoring shall be completed according to the following schedule:

Table E-6. Monitoring Periods and Reporting Schedule

Sampling Frequency	Monitoring Period Begins On …	Monitoring Period	SMR Due Date
Continuous	February 1, 2013	All	Submit with monthly SMR
Daily	February 1, 2013	(Midnight through 11:59 PM) or any 24-hour period that reasonably represents a calendar day for purposes of sampling.	Submit with monthly SMR
Weekly	Sunday following permit effective date or on permit effective date if on a Sunday	Sunday through Saturday	Submit with monthly SMR
Monthly	First day of calendar month following permit effective date or on permit effective date if that date is first day of the month	1st day of calendar month through last day of calendar month	Submit with monthly SMR
Quarterly	Closest of January 1, April 1, July 1, or October 1 following (or on) permit effective date	January 1 through March 31 April 1 through June 30 July 1 through September 30 October 1 through December 31	Submit with next monthly SMR
Semiannually	Closest of January 1 or July 1 following (or on) permit effective date	January 1 through June 30 July 1 through December 31	Submit with next monthly SMR
Annually	January 1 following (or on) permit effective date	January 1 through December 31	Submit with Annual Report
Once during permit term	February 1, 2013	February 1, 2013 through June 1, 2017	Submit within 180 days before the permit expiration date

4. Reporting Protocols. The Discharger shall report with each sample result the applicable reported Minimum Level (ML) and the current Method Detection Limit (MDL), as determined by the procedure in 40 CFR 136.

   The Discharger shall report the results of analytical determinations for the presence of chemical constituents in a sample using the following reporting protocols:

   a. Sample results greater than or equal to the reported ML shall be reported as measured by the laboratory (i.e., the measured chemical concentration in the sample).

   b. Sample results less than the reported ML, but greater than or equal to the laboratory's MDL, shall be reported as "Detected, but Not Quantified," or DNQ. The estimated chemical concentration of the sample shall also be reported.

      For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ as well as the words "Estimated Concentration" (may be shortened to "Est. Conc."). The laboratory may, if such information is available, include numerical estimates of the data quality for the reported result. Numerical estimates of data quality may be percent accuracy (± a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.

   c. Sample results less than the laboratory's MDL shall be reported as "Not Detected," or ND.

   d. Dischargers are to instruct laboratories to establish calibration standards so that the ML value (or its equivalent if there is differential treatment of samples relative to calibration standards) is the lowest calibration standard. At no time is the Discharger to use analytical data derived from *extrapolation* beyond the lowest point of the calibration curve.

5. The Discharger shall submit SMRs in accordance with the following requirements:

   a. The data shall be summarized to clearly illustrate whether the facility is operating in compliance with interim and/or final effluent limitations. The Discharger is not required to duplicate the submittal of data that is entered in a tabular format within CIWQS. If CIWQS does not provide for entry into a tabular format within the system, the Discharger shall electronically submit the data in a tabular format as an attachment.

   b. In the SMR, the Discharger shall clearly identify violations of the WDRs and discuss corrective actions taken or planned and the proposed time schedule for corrective actions. Identified violations must include a description of the requirement that was violated and a description of the violation.

   c. An Annual SMR shall be due on February 1 following each calendar year and shall include:

      - All data required by this MRP for the corresponding monitoring period, including appropriate calculations to verify compliance with effluent limitations.

      - A discussion of any incident of non-compliance and corrective actions taken.

C. Discharge Monitoring Reports (DMRs)

1. As described in Section X.B.1 above, at any time during the term of this permit, the State or Central Coast Water Board may notify the Discharger to electronically submit SMRs that will satisfy federal requirements for submittal of Discharge Monitoring Reports (DMRs). Until such notification is given, the Discharger shall submit DMRs in accordance with the requirements described below.

2. DMRs must be signed and certified as required by the standard provisions (Attachment D). The Discharge shall submit the original DMR and one copy of the DMR to the address listed below.

Standard Mail	Fedex/UPS/Other Private Carriers
State Water Resources Control Board Division of Water Quality c/o DMR Processing Center PO Box 100 Sacramento, CA 95812-1000	State Water Resources Control Board Division of Water Quality c/o DMR Processing Center 1001 I Street, 15^{th} Floor Sacramento, CA 95814

3. All discharge monitoring results must be reported on the official USEPA pre-printed DMR forms (EPA Form 3320-1). Forms that are self-generated or modified cannot be accepted.

D. Other Reports

1. Unless otherwise noted, with the next SMR, the Discharger shall report the results of any special monitoring, TREs, or other data or information that results from the Special Provisions, section VI. C, of the Order.

ATTACHMENT F – FACT SHEET

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ATTACHMENT F – FACT SHEET

As described in section II of the Order, this Fact Sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of this Order.

This Order has been prepared under a standardized format to accommodate a broad range of discharge requirements for dischargers in California. Only those sections or subsections of this Order that are specifically identified as "not applicable" have been determined not to apply to this Discharger. Sections or subsections of this Order not specifically identified as "not applicable" are fully applicable to this Discharger.

I. PERMIT INFORMATION

The following table summarizes administrative information related to the facility.

Table F-1. Facility Information

WDID	3 440103001
Discharger	City of Scotts Valley
Name of Facility	City of Scotts Valley Wastewater Treatment Facility
Facility Address	700 Lundy Lane
	Scotts Valley, CA 95066
	Santa Cruz County
Facility Contact, Title and Phone	Scott Hamby, Wastewater and Environmental Program Manager, (831) 438-0732
Authorized Person to Sign and Submit Reports	Scott Hamby, Wastewater and Environmental Program Manager, (831) 438-0732
Mailing Address	One Civic Center Drive, Scotts Valley, CA 95066
Billing Address	One Civic Center Drive, Scotts Valley, CA 95066
Type of Facility	POTW
Major or Minor Facility	Major
Threat to Water Quality	2
Complexity	A
Pretreatment Program	Yes
Reclamation Requirements	Producer, WDRs Order No. 01-066
Facility Permitted Flow	1.5 million gallons per day (MGD)
Facility Design Flow	1.5 MGD
Watershed	Big Basin Hydrologic Unit (304)
Receiving Waters	Pacific Ocean (Monterey Bay National Marine Sanctuary)
Receiving Water Type	Ocean Water

A. The City of Scotts Valley (hereinafter, the Discharger) is the owner and operator of a wastewater treatment facility (hereinafter, Facility), a Publicly Owned Treatment Works (POTW).

For the purposes of this Order, references to the "discharger" or "Permittee" in applicable federal and state laws, regulations, plans, or policy are held to be equivalent to references to the Discharger herein.

B. The Facility discharges wastewater to the Pacific Ocean (into the Monterey Bay National Marine Sanctuary), a water of the United States, and is currently regulated by Order R3-2007-0013, which was adopted on September 7, 2007, and expired on October 27, 2012. The terms and conditions of the current Order was automatically continued and remain in effect until new waste discharge requirements and a National Pollutant Discharge Elimination System (NPDES) permit are adopted pursuant to this Order.

C. The Discharger filed a Report of Waste Discharge and submitted an application for renewal of its waste discharge requirements (WDRs) and NPDES permit on February 15, 2012. A site visit was conducted on May 7, 2012, to observe operations and collect additional data to develop permit limitations and conditions.

II. FACILITY DESCRIPTION

A. Wastewater and Biosolids Treatment

The City of Scotts Valley owns and operates the wastewater treatment facility. Treatment facilities consist of screening, grit removal, flow equalization, aeration, clarification, and disinfection. Biosolids (sewage sludge or solid wastes) are anaerobically digested, dewatered, and disposed of at the Monterey Regional Waste Management Landfill in Marina, California.

B. Discharge Points and Receiving Waters

The Discharger's wastewater is combined with the effluent from the City of Santa Cruz's Wastewater Treatment Facility and discharged to the Pacific Ocean and the Monterey Bay National Marine Sanctuary through a 12,250 foot-long outfall/diffuser system in approximately 410 feet of water at 36° 56' 08" N. Latitude, 122° 04' 08" W. Longitude (Discharge Point 001).

Discharges through Discharge Point 001 consist of secondary treated wastewater as described above. The minimum initial dilution provided by the outfall/diffuser system is 114:1 (parts seawater: parts effluent), a figure that has been used by Central Coast Water Board staff to determine the need for water quality-based effluent limitations, and, if necessary, to calculate those limitations. This Order retains the dilution ratio of 114:1 from the previous permit. At their discretion, the Discharger can apply to the Central Coast Water Board for approval of a different dilution ratio that is protected of water quality in all discharge scenarios.

C. Summary of Existing Requirements and Effluent Characterization

Effluent limitations contained in the previous Order for discharges from Discharge Point 001 and representative monitoring data for Monitoring Location EFF-001, for the last three years of the permit term (i.e., 2009 through 2011) are presented in the following tables.

Table F-2. Historic Effluent Limitations, Discharge Point 001

Parameter	Units	Effluent Limitations			
		Average Monthly	Average Weekly	Daily Maximum	Instantaneous Maximum
BOD_5	mg/L	30	45	90	--
	lb/day [1]	375	565	1,125	--
$CBOD_5$	mg/L	25	40	85	--
	lb/day [1]	310	500	1,060	--
TSS	mg/L	30	45	90	--
	lb/day [1]	375	565	1,125	--
$CBOD_5$, BOD_5, and TSS	%	Removal by treatment shall not be less than 85 percent			
Oil & Grease	mg/L	25	40	75	--

Parameter	Units	Effluent Limitations			
		Average Monthly	Average Weekly	Daily Maximum	Instantaneous Maximum
	lb/day	310	500	940	--
Settleable Solids	mL/L/hr	1.0	1.5	--	3.0
Turbidity	NTU	75	100	--	225
Total coliform	MPN/100 mL				100,000
Fecal coliform	MPN/100 mL				20,000 [2], [3]
Enterococcus	MPN/100 mL				2,400 [4]
Acute Toxicity	TUa			3.7	
Chronic Toxicity	TUc			115	
pH	pH Units	6.0 – 9.0			
Total Chlorine Residual	mg/L	0.23 [5]		0.93	6.9
	lb/day	2.9		12	86

[1] For flows less than 1.5 MGD, mass emission rates shall not exceed the “Maximum Allowable Mass Emissions Rate.”

[2] Not more than ten percent of the total smples collected in any 60-day period shall exceed 40,000 per 100 mL.

[3] The fecal coliform concentration, based on a minimum of not less than five samples for any 30-day period, shall not exceed a log mean of 20,000 per 100 mL.

[4] The enterococcus concentration, based on a minimum of not less than five samples for any 30-day period, shall not exceed a log mean of 2,400 per 100 mL for any 30-day period, or a log mean of 1,200 per 100 mL for any 6-month period.

[5] This value is expressed as a 6-month median effluent limitation.

Table F-3. Effluent Characterization – 2009 through 2011

	Units	Monthly Minimum	Monthly Maximum	Monthly Average
Effluent Flow	MGD	0.450	1.092	0.721
BOD_5	mg/L	2	5	4
BOD_5 Removal	%	98.0	99.2	98.7
$CBOD_5$	mg/L	2	5	3
$CBOD_5$ Removal	%	98.0	99.2	98.7
TSS	mg/L	5	10	7.33
TSS Removal	%	97.0	98.1	97.2
Oil & Grease	mg/L	< 5	18	< 5
pH	pH units	7.0	7.4	--
Turbidity	NTUs	1.6	8.7	4.5
Settleable Solids	mLs/L/Hr	< 0.1	< 0.1	< 0.1
Total Chlorine Residual	mg/L	< 0.01	0.06	< 0.01
Total coliform	MPN/100 mL	680	18,720	2,111.3
Fecal coliform	MPN/100 mL	141	15,317	382.7
Enterococcus	MPN/100 mL	10	204	83.3

Source: City of Scotts Valley Wastewater Treatment Facility, permit renewal application, February 15, 2012.

D. Compliance Summary

Based on review of self-monitoring data for the period from 2009 through 2011 submitted with the permit renewal application package, there were no violations of effluent limitations.

E. Planned Changes – Not Applicable

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements contained in the proposed Order are based on the requirements and authorities described in this section.

A. Legal Authorities

This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations adopted by the U.S. Environmental Protection Agency (USEPA) and chapter 5.5, division 7 of the California Water Code (commencing with section 13370). It shall serve as an NPDES permit for point source discharges from this facility to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the Water Code (commencing with section 13260).

B. California Environmental Quality Act (CEQA)

Pursuant to Water Code section 13389, this action to adopt an NPDES permit is exempt from the provisions of CEQA, Public Resources Code sections 21100 - through 21177.

C. State and Federal Regulations, Policies, and Plans

1. **Water Quality Control Plans.** The Central Coast Water Board has adopted a *Water Quality Control Plan for the Central Coastal Basin* (the Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters within the Region. To address ocean waters, the Basin Plan incorporates by reference the *Water Quality Control Plan for Ocean Waters of California* (the Ocean Plan), which was adopted in 1972 and amended in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The most recent amendment to the Ocean Plan was adopted by the State Water Resources Control Board (the State Water Board) on April 21, 2005 and became effective on February 14, 2006.

   The Basin Plan implements State Water Board Resolution No. 88-63, which establishes State policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply (MUN). Because of very high levels of total dissolved solids (TDS) in the Pacific Ocean, including the Monterey Bay National Marine Sanctuary, the receiving waters for discharges from the City of Scotts Valley Wastewater Treatment Facility meet an exception to Resolution No. 88-63, which precludes waters with TDS levels greater than 3,000 mg/L from the MUN designation. Beneficial uses established by the Basin Plan and the Ocean Plan for the Pacific Ocean, including Monterey Bay National Marine Sanctuary, are described in section II. H and I of the Order.

   Requirements of this Order implement the Basin Plan and Ocean Plan.

2. **Thermal Plan.** The State Water Board adopted a *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Water and Enclosed Bays and Estuaries of California* (Thermal Plan) on May 18, 1972, and amended this plan on September 18, 1975. This plan contains the following temperature objective for existing discharges to enclosed bays and coastal waters of California.

   Elevated temperature waste discharges shall comply with limitations necessary to assure protection of beneficial uses.

The Ocean Plan defines elevated temperature wastes as:

> *Liquid, solid, or gaseous material discharged at a temperature higher than the natural temperature of receiving water.*

3. **California Ocean Plan**. The State Water Board adopted the *Water Quality Control Plan for Ocean Waters of California, California Ocean Plan* (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, 2005, and 2009. The State Water Board adopted the latest amendment on September 15, 2009, and was approved by the Office of Administrative Law on March 10, 2010, and subsequently the USEPA. The Ocean Plan is applicable, in its entirety, to point source discharges to the Pacific Ocean and the Monterey Bay National Marine Sanctuary.

4. **Alaska Rule.** On March 30, 2000, USEPA revised its regulation that specifies when new and revised state and tribal water quality standards become effective for CWA purposes. [65 Fed. Reg. 24641 (April 27, 2000), codified at 40 CFR 131.21] Under the revised regulation (also known as the Alaska Rule), new and revised standards submitted to USEPA after May 30, 2000 must be approved by USEPA before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by May 30, 2000, may be used for CWA purposes, whether or not approved by USEPA.

5. **Antidegradation Policy.** NPDES regulations at 40 CFR 131.12 require that State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16, which incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that the existing quality of waters be maintained unless degradation is justified based on specific findings. The Central Coast Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. The permitted discharge must be consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16.

6. **Anti-Backsliding Requirements.** CWA Sections 402 (o) (2) and 303 (d) (4) and NPDES regulations at 40 CFR 122.44 (l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed.

D. Impaired Water Bodies on CWA 303 (d) List

CWA section 303 (d) requires states to identify specific water bodies where water quality standards are not expected to be met after implementation of technology-based effluent limitations on point sources. For all 303 (d) listed water bodies and pollutants, the Central Coast Water Board must develop and implement TMDLs (Total Maximum Daily Loads) that will specify WLAs (Waste Load Allocations) for point sources and Load Allocations for non-point sources.

The State's 2008-2010 303 (d) list of impaired water bodies, which was approved by USEPA on November 12, 2011, identifies Monterey Harbor as impaired by metals and unknown toxicity. The main body of Monterey Bay is not identified as 303 (d)-impaired.

E. Other Plans, Polices and Regulations

1. **Discharges of Storm Water.** For the control of storm water discharged from the site of the wastewater treatment and disposal facilities, the Order requires, if applicable, the Discharger to seek authorization to discharge under and meet the requirements of the State Water

Resources Control Board's Water Quality Order 97-03-DWQ, NPDES General Permit No. CAS000001, *Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities*.

2. **Statewide General Waste Discharge Requirements for Sanitary Sewer Systems (State Water Board Order No. 2006-0003-DWQ).** This General Permit, adopted on May 2, 2006, is applicable to all "federal and state agencies, municipalities, counties, districts, and other public entities that own or operate sanitary sewer systems greater than one mile in length that collect and/or convey untreated or partially treated wastewater to a publicly owned treatment facility in the State of California." The purpose of the General Permit is to promote the proper and efficient management, operation, and maintenance of sanitary sewer systems and to minimize the occurrences and impacts of sanitary sewer overflows. The Order requires the Discharger to seek coverage under the General Permit, if applicable, and comply with its requirements.

IV. RATIONALE FOR EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

The CWA requires point source dischargers to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the United States. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. NPDES regulations establish two principal bases for effluent limitations. At 40 CFR 122.44 (a) permits are required to include applicable technology-based limitations and standards; and at 40 CFR 122.44 (d) permits are required to include water quality-based effluent limitations (WQBELs) to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water. When numeric water quality objectives have not been established, but a discharge has the reasonable potential to cause or contribute to an excursion above a narrative criterion, WQBELs may be established using one or more of three methods described at 40 CFR 122.44 (d) - 1) WQBELs may be established using a calculated water quality criterion derived from a proposed State criterion or an explicit State policy or regulation interpreting its narrative criterion; 2) WQBELs may be established on a case-by-case basis using U.S. EPA criteria guidance published under CWA Section 304 (a); or 3) WQBELs may be established using an indicator parameter for the pollutant of concern.

A. Discharge Prohibitions

1. Discharge Prohibition III. A (No discharge to Monterey Bay at a location other than as described by the Order). The Order authorizes a single, specific point of discharge to Monterey Bay; and this prohibition reflects CWA section 402's prohibition against discharges of pollutants except in compliance with the Act's permit requirements, effluent limitations, and other enumerated provisions. This prohibition is also retained from the previous permit.

2. Discharge Prohibition III. B (Discharges in a manner, except as described by the Order are prohibited). Because limitations and conditions of the Order have been prepared based on specific information provided by the Discharger and specific wastes described by the Discharger, the limitations and conditions of the Order do not adequately address waste streams not contemplated during drafting of the Order. To prevent the discharge of such waste streams that may be inadequately regulated, the Order prohibits the discharge of any waste that was not described by to the Central Coast Water Board during the process of permit reissuance.

3. Discharge Prohibition III. C (Discharges of radiological, chemical, or biological warfare agent or high level radioactive waste to the Ocean is prohibited). This prohibition restates a discharge prohibition established in section III. H of the Ocean Plan.

4. Discharge Prohibition III. D (Federal law prohibits the discharge of sludge by pipeline the Ocean. The discharge of municipal or industrial waste sludge directly to the Ocean or into a waste stream that discharges to the Ocean is prohibited. The discharge of sludge digester supernatant, without further treatment, directly to the Ocean or to a waste stream that discharges to the Ocean, is prohibited.) This prohibition reflects the prohibition in Chapter III. H of the Ocean Plan.

5. Discharge Prohibition III. E (The overflow or bypass of wastewater from the Discharger's collection, treatment, or disposal facilities and the subsequent discharge of untreated or partially treated wastewater, except as provided for in Attachment D, Standard Provision I.G. (Bypass), is prohibited). The discharge of untreated or partially treated wastewater from the Discharger's collection, treatment, or disposal facilities represents an unauthorized bypass pursuant to 40 CFR 122.41 (m) or an unauthorized discharge, which poses a threat to human health and/or aquatic life, and therefore, is explicitly prohibited by the Order.

B. Technology-Based Effluent Limitations

1. Scope and Authority

NPDES regulations at 40 CFR 122.44 (a) require that permits include applicable technology-based limitations and standards. Where the USEPA has not yet developed technology based standards for a particular industry or a particular pollutant, CWA Section 402 (a) (1) and USEPA regulations at 40 CFR 125.3 authorize the use of best professional judgment (BPJ) to derive technology-based effluent limitations on a case-by-case basis. When BPJ is used, the permit writer must consider specific factors outlined at 40 CFR 125.3.

This Order includes limitations based on the minimum level of effluent quality attainable by secondary treatment, as established at 40 CFR 133. The Secondary Treatment Regulation includes the following limitations applicable to all publicly owned treatment works (POTWs).

Table F-4. Secondary Treatment Requirements

Parameter	Effluent Limitation		
	30-Day Avg	7-Day Avg	Percent Removal [1]
BOD_5	30 mg/L	45 mg/L	85
$CBOD_5$ [2]	25 mg/L	40 mg/L	85
TSS	30 mg/L	45 mg/L	85
pH	6.0 – 9.0		---

[1] 30-day average
[2] At the option of the permitting authority, effluent limitations for $CBOD_5$ may be substituted for those limitations specified for BOD_5.

In addition, the State Water Board, in Table A of the Ocean Plan, has established technology-based requirements, applicable to all POTWs, for oil and grease, suspended and settleable solids, turbidity, and pH.

2. Applicable Technology-Based Effluent Limitations

The following table summarizes technology-based effluent limitations established by the Order.

Table F-5. Summary of Technology-Based Effluent Limitations

Parameter	Units	Effluent Limitations			
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Maximum
BOD_5 [1],[2]	mg/L	30	45	90	--
	lbs/day	375	565	1,125	--
$CBOD_5$ [1],[2]	mg/L	25	40	85	--
	lbs/day	310	500	1,060	--
TSS [2]	mg/L	30	45	90	--
	lbs/day	375	565	1,125	--
Oil & Grease	mg/L	25	40	75	--
	lbs/day	310	500	940	--
Settleable Solids	mL/L/hr	1.0	1.5	--	3.0
Turbidity	NTUs	75	100	--	225
pH	pH units	6.0 – 9.0 at all times			

[1] Following approval by the Executive Officer, the $CBOD_5$ effluent limit may be substituted for the BOD_5 effluent limit.

[2] 30-day average percent removal shall not be less than 85%.

All technology-based limitations are retained from the previous permit and are required by NPDES regulations at 40 CFR 133 and/or Table A of the Basin Plan. Mass-based limitations for $CBOD_5$, TSS, and oil and grease are based on a discharge rate of 1.5 MGD, the design treatment capacity of the City of Scotts Valley Wastewater Treatment Facility.

C. Water Quality-Based Effluent Limitations (WQBELs)

1. Scope and Authority

NPDES regulations at 40 CFR 122.44 (d) require that permits include limitations more stringent than applicable federal technology-based requirements where necessary to achieve applicable water quality standards, including numeric and narrative objectives within a standard.

The process for determining the reasonable potential for a pollutant to violate water quality standards and calculating WQBELs, when necessary, is intended to protect the designated uses of receiving waters as specified in the Basin and Ocean Plans, and achieve applicable water quality objectives and criteria that are contained in the Basin Plan and in other applicable State and federal rules, plans, and policies, including applicable water quality criteria from the Ocean Plan.

Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, WQBELs must be established in accordance with the requirements of 40 CFR 122.44 (d) (1) (vi), using (1) USEPA criteria guidance under CWA section 304 (a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting the state's narrative criterion, supplemented with other relevant information.

2. Applicable Beneficial Uses and Water Quality Criteria and Objectives

Beneficial uses for ocean waters of the Central Coast Region are established by the Basin Plan and Ocean Plan and are described by Findings H and I, respectively, of Section II of the Order.

Water quality criteria applicable to ocean waters of the Region are established by the Ocean Plan, which includes water quality objectives for bacterial characteristics, physical characteristics, chemical characteristics, biological characteristics, and radioactivity. The water quality objectives from the Ocean Plan are incorporated as receiving water limitations into this Order. In addition, Table B of the Ocean Plan contains numeric water quality objectives for 83 toxic pollutants for the protection of marine aquatic life and human health. Pursuant to NPDES regulations at 40 CFR 122.44 (d) (1), and in accordance with procedures established by the Ocean Plan (2005), the Central Coast Water Board has performed a reasonable potential analysis (RPA) to determine the need for effluent limitations for the Table B toxic pollutants.

3. Determining the Need for WQBELs

Procedures for performing a reasonable potential analysis (RPA) for ocean dischargers are described in Section III.C and Appendix VI of the Ocean Plan. The procedure is a statistical method that projects an effluent data set while taking into account the averaging period of WQOs, the long term variability of pollutants in the effluent, limitations associated with sparse data sets, and uncertainty associated with censored data sets. The procedure assumes a lognormal distribution of the effluent data set, and compares the 95th percentile concentration at 95 percent confidence of each Table B pollutant, accounting for dilution, to the applicable water quality criterion. The RPA results in one of three following endpoints.

Endpoint 1 – There is "reasonable potential." An effluent limitation must be developed for the pollutant. Effluent monitoring for the pollutant, consistent with the monitoring frequency in Appendix III (Ocean Plan), is required.

Endpoint 2 - There is no "reasonable potential." An effluent limitation is not required for the pollutant. Appendix III (Ocean Plan) effluent monitoring is not required for the pollutant; the Regional Board, however, may require occasional monitoring for the pollutant or for whole effluent toxicity as appropriate.

Endpoint 3 - The RPA is inconclusive. Monitoring for the pollutant or whole effluent toxicity testing, consistent with the monitoring frequency in Appendix III (Ocean Plan), is required. An existing effluent limitation for the pollutant shall remain in the permit, otherwise the permit shall include a reopener clause to allow for subsequent modification of the permit to include an effluent limitation if the monitoring establishes that the discharge causes, has the reasonable potential to cause, or contribute to an excursion above a Table B water quality objective.

The State Water Board has developed a reasonable potential calculator (RPcalc 2.0), which is available at: http://www.waterboards.ca.gov/plnspols/docs/oplans/rpcalc.zip

RPcalc 2.0 was used in the development of this Order and considers several pathways in the determination of reasonable potential.

a. First Path

If available information about the receiving water or the discharge supports a finding of reasonable potential without analysis of effluent data, the Central Coast Water Board may decide that WQBELs are necessary after a review of such information. Such information may include: the facility or discharge type, solids loading, lack of dilution, history of compliance problems, potential toxic effects, fish tissue data, 303 (d) status of the receiving water, or the presence of threatened or endangered species or their critical habitat, or other information.

b. Second Path

If any pollutant concentration, adjusted to account for dilution, is greater than the most stringent applicable water quality objective, there is reasonable potential for that pollutant.

c. Third Path

If the effluent data contains 3 or more detected and quantified values (i.e., values that are at or above the ML), and all values in the data set are at or above the ML, a parametric RPA is conducted to project the range of possible effluent values. The 95th percentile concentration is determined at 95 percent confidence for each pollutant, and compared to the most stringent applicable water quality objective to determine reasonable potential. A parametric analysis assumes that the range of possible effluent values is distributed lognormally. If the 95th percentile value is greater than the most stringent applicable water quality objective, there is reasonable potential for that pollutant.

d. Fourth Path

If the effluent data contains 3 or more detected and quantified values (i.e., values that are at or above the ML), but at least one value in the data set is less than the ML, a parametric RPA is conducted according to the following steps.

(1) If the number of censored values (those expressed as a "less than" value) account for less than 80 percent of the total number of effluent values, calculate the M_L (the mean of the natural log of transformed data) and S_L (the standard deviation of the natural log of transformed data) and conduct a parametric RPA, as described above for the Third Path.

(2) If the number of censored values account for 80 percent or more of the total number of effluent values, conduct a non-parametric RPA, as described below for the Fifth Path. (A non-parametric analysis becomes necessary when the effluent data is limited, and no assumptions can be made regarding its possible distribution.)

e. Fifth Path

A non-parametric RPA is conducted when the effluent data set contains less than 3 detected and quantified values, or when the effluent data set contains 3 or more detected and quantified values but the number of censored values accounts for 80 percent or more of the total number of effluent values. A non-parametric analysis is conducted by ordering the data, comparing each result to the applicable water quality objective, and accounting for ties. The sample number is reduced by one for each tie, when the dilution-adjusted method detection limit (MDL) is greater than the water quality objective. If the adjusted sample number, after accounting for ties, is greater than 15, the pollutant has no reasonable potential to exceed the water quality objective. If the sample number is 15 or less, the RPA is inconclusive, monitoring is required, and any existing effluent limits in the expiring permit are retained.

An RPA was conducted using effluent data reported from annual monitoring events from July 2003 until July 2008 for most Ocean Plan pollutants. TCDD Equivalents data collected from September 2008 to August 2011 were obtained from SMR data posted to CIWQS. The following table presents results of the RPA, performed in accordance with procedures described by the Ocean Plan for the Scotts Valley Wastewater Treatment Facility. The maximum effluent concentration adjusted for **complete mixing**, the applicable WQO, and the RPA endpoint for each Table B pollutant is identified. As shown in the following tables, the RPA commonly lead to Endpoint 3, meaning that the RPA is inconclusive, when a majority of the effluent data is reported as ND (not detected). In these circumstances, the Regional Water Board concludes that additional monitoring will be required for those pollutants during the term of the reissued permit and existing effluent limits will be retained.

Table F-6. RPA Results for Discharges of Secondary Effluent

Table B Pollutant	Most Stringent WQO (µg/L)	No. of Samples	No. of Non-Detects	Max Effluent Conc. (µg/L)	RPA Result, Comment
Objectives for Protection of Marine Aquatic Life					
Ammonia (as N)	600	2	0	10	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Arsenic	8	2	1	3.0	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Cadmium	1	2	2	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Chlorinated Phenolics	1	2	1	0.0058	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Chromium (VI)	2	2	2	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Copper	3	2	0	2.0	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Cyanide	1	2	1	0.0096	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Endosulfan (total)	0.009	2	1	0.000019	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Endrin	0.002	2	2	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
HCH	0.004	2	1	0.0007	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Lead	2	2	2	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Mercury	0.04	2	2	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Nickel	5	2	0	0.02	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.

Table B Pollutant	Most Stringent WQO (µg/L)	No. of Samples	No. of Non-Detects	Max Effluent Conc. (µg/L)	RPA Result, Comment
Non-chlorinated Phenolics	30	4	4	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Selenium	15	2	2	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Silver	0.7	2	2	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Total Residual Chlorine	2	241	182	70	**Endpoint 2 – Effluent limitation not required.**
Zinc	20	2	0	65	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Objectives for Protection of Human Health - Noncarcinogens					
1,1,1-Trichloroethane	540000	2	2	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
2,4-Dinitrophenol	4.0	2	2	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
2-Methyl-4,6-Dinitrophenol	220	5	5	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Acrolein	220	2	2	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Antimony	1200	2	1	0.0030	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Bis(2-Chloroethoxy)Methane	4.4	2	2	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Bis(2-Chloroisopropyl)Ether	1200	4	4	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Chlorobenzene	570	2	2	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Chromium (III)	190000	2	1	0.0013	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Dichlorobenzenes	5100	2	2	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Diethyl Phthalate	33000	2	2	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Dimethyl Phthalate	820000	2	2	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Di-n-Butyl Phthalate	3500	2	1	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Ethylbenzene	4100	2	2	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Fluoranthene	15	2	1	0.0000044	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Hexachlorocyclo-pentadiene	58	2	2	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Nitrobenzene	4.9	2	2	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Thallium	2	2	2	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Toluene	85000	3	2	0.017	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Tributylin	0.0014	2	2	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Objectives for Protection of Human Health - Carcinogens					
1,1,2,2-Tetrachloroethane	2.3	4	4	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.

Table B Pollutant	Most Stringent WQO (µg/L)	No. of Samples	No. of Non-Detects	Max Effluent Conc. (µg/L)	RPA Result, Comment
1,1,2-Trichloroethane	9.4	4	4	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
1,1-Dichloroethylene	0.9	4	4	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
1,2-Dichloroethane	28	4	4	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
1,2-Diphenylhydrazine	0.16	4	4	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
1,3-Dichloropropylene	8.9	4	4	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
1,4-Dichlorobenzene	18	4	4	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
TCDD Equivalents	3.9×10^{-9}	6	1	3.4×10^{-8}	**Endpoint 1 – Effluent limitation is necessary.**
2,4,6-Trichlorophenol	0.29	4	2	0.0058	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
2,4-Dinitrotoluene	2.6	4	4	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
3,3'-Dichlorobenzidine	0.0081	4	4	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Acrylonitrile	0.10	4	4	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Aldrin	2.2×10^{-5}	4	4	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Benzene	5.9	4	4	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Benzidine	6.9×10^{-5}	4	4	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Beryllium	0.033	4	4	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Bis(2-Chloroethyl)Ether	0.045	2	2	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Bis(2-Ethylhexyl)Phthalate	3.5	5	4	0.17	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Carbon Tetrachloride	0.90	4	4	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Chlordane	2.3×10^{-5}	4	3	1.3×10^{-7}	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Chlorodibromomethane	8.6	4	1	0.087	**Endpoint 2 – Effluent limitation not required.**
Chloroform	130	4	0	0.16	**Endpoint 2 – Effluent limitation not required.**
DDT (total)	0.00017	4	3	4.7×10^{-6}	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Dichlorobromomethane	6.2	4	0	0.17	**Endpoint 2 – Effluent limitation not required.**
Dieldrin	0.00004	4	3	4.1×10^{-7}	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Halomethanes	130	4	1	0.43	**Endpoint 2 – Effluent limitation not required.**
Heptachlor	5.0×10^{-5}	4	3	1.5×10^{-8}	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Heptachlor Epoxide	0.00002	4	4	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.

Table B Pollutant	Most Stringent WQO (µg/L)	No. of Samples	No. of Non-Detects	Max Effluent Conc. (µg/L)	RPA Result, Comment
Hexachlorobenzene	2.1×10^{-4}	4	3	4.5×10^{-8}	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Hexachlorobutadiene	14	4	4	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Hexachloroethane	2.5	4	4	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Isophorone	730	4	4	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Methylene Chloride	450	5	5	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
N-Nitrosodimethylamine	7.3	4	4	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
N-Nitrosodi-n-Propylamine	0.38	5	5	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
N-Nitrosodiphenylamine	2.5	4	4	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
PAHs (total)	8.8×10^{-3}	4	3	1.5×10^{-5}	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
PCBs	1.9×10^{-5}	4	3	7.4×10^{-7}	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Tetrachloroethylene	2.0	4	4	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Toxaphene	0.00021	4	4	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Trichloroethylene	27	4	4	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.
Vinyl Chloride	36	4	4	ND	Endpoint 3 – RPA is inconclusive. Less than 3 detects or greater than 80% ND.

NA indicates that effluent data is not available.
ND indicates that the pollutant was not detected.
Minimum probable initial dilution for this Discharger is 114:1.
Effluent data used for this RPA were collected from July 2003 to July 2008.
All units are µg/L.

4. WQBEL Calculations

Based on results of the RPA, performed in accordance with methods of the Ocean Plan for discharges to the Pacific Ocean, the Water Board is establishing WQBELs for TCDD Equivalents based on a conclusion of Endpoint 1. An Endpoint 2 was concluded for total residual chlorine, chlorodibromomethane, chloroform, dichlorobromomethane, and halomethanes. The previous permit included limits for total residual chlorine, and based on a conclusion of Endpoint 2, the limit is not required; however, the Central Coast Water Board retains the effluent limitation for total residual chlorine because the facility uses chlorine to disinfect secondary effluent from the treatment plant and therefore reasonable potential exists based on this information. The Water Board is also establishing WQBELs for whole effluent, acute and chronic toxicity, which are also pollutants or pollutant parameters identified by Table B of the Ocean Plan.

As described by Section III. C of the Ocean Plan, effluent limits for Table B pollutants are calculated according to the following equation.

Ce = Co + Dm (Co – Cs)

Where …

Ce = the effluent limitation (µg/L)

Co = the concentration (the water quality objective) to be met at the completion of initial dilution (µg/L).

Cs = background seawater concentration (µg/L)

Dm = minimum probable initial dilution expressed as parts seawater per part wastewater (here, Dm = 114)

For the City of Scotts Valley Wastewater Treatment Facility, the Dm of 114 is unchanged from Order No. R3-2007-0013. Initial dilution is the process that results in the rapid and irreversible turbulent mixing of wastewater with ocean water around the point of discharge. As site-specific water quality data is not available, in accordance with Table B implementing procedures, Cs equals zero for all pollutants, except the following.

Table F-7. Background Concentrations (Cs) - Ocean Plan (Table C)

Pollutant	Background Seawater Concentration
Arsenic	3 µg/L
Copper	2 µg/L
Mercury	0.0005 µg/L
Silver	0.16 µg/L
Zinc	8 µg/L

For all other Table B parameters, Cs=0

Applicable water quality objectives from Table B of the Ocean Plan are as follows.

Table F-8. Water Quality Objectives (Co)–Ocean Plan (Table B) Objectives for Protection of Marine Aquatic Life

Pollutant	Units	6-Month Median	Daily Maximum	Instantaneous Maximum
Arsenic	µg/L	8	32	80
Cadmium	µg/L	1	4	10
Chromium (VI)	µg/L	2	8	20
Copper	µg/L	3	12	30
Lead	µg/L	2	8	20
Mercury	µg/L	0.04	0.16	0.4
Nickel	µg/L	5	20	50
Selenium	µg/L	15	60	150
Silver	µg/L	0.7	2.8	7
Zinc	µg/L	20	80	200
Cyanide	µg/L	1	4	10
Total Chlorine Residual	µg/L	2	8	60
Ammonia		600	2400	6000
Acute Toxicity	TUa	-------	0.3	-------
Chronic Toxicity	TUc	-------	1	-------
Non-chlorinated Phenolics	µg/L	30	120	300
Chlorinated Phenolics	µg/L	1	4	10

Pollutant	Units	6-Month Median	Daily Maximum	Instantaneous Maximum
Endosulfan (total)	µg/L	0.009	0.018	0.027
Endrin	µg/L	0.002	0.004	0.006
HCH	µg/L	0.004	0.008	0.012
Radioactivity		-------	-------	-------

Objectives for Protection of Human Health - (Non-Carcinogens)

Pollutant	Units	30-day Average
Acrolein	µg/L	220
Antimony	µg/L	1200
Bis(2-Chloroethoxy)Methane	µg/L	4.4
Bis(2-Chloroisopropyl)Ether	µg/L	1200
Chlorobenzene	µg/L	570
Chromium (III)	µg/L	190,000
Di-n-Butyl Phthalate	µg/L	3500
Dichlorobenzenes	µg/L	5100
Diethyl Phthalate	µg/L	33000
Dimethyl Phthalate	µg/L	820,000
2-Methyl-4,6-Dinitrophenol	µg/L	220
2,4-Dinitrophenol	µg/L	4
Ethylbenzene	µg/L	4100
Fluoranthene	µg/L	15
Hexachlorocyclopentadiene	µg/L	58
Nitrobenzene	µg/L	4.9
Thallium	µg/L	2
Toluene	µg/L	85,000
Tributyltin	µg/L	0.0014
1,1,1-Trichloroethane	µg/L	540,000

Objectives for Protection of Human Health - (Carcinogens)

Pollutant	Units	30-day Average
Acrylonitrile	µg/L	0.1
Aldrin	µg/L	0.000022
Benzene	µg/L	5.9
Benzidine	µg/L	0.000069
Beryllium	µg/L	0.033
Bis(2-Chloroethyl)Ether	µg/L	0.045
Bis(2-Ethylhexyl)Phthalate	µg/L	3.5
Carbon Tetrachloride	µg/L	0.9
Chlordane	µg/L	0.000023
Chlorodibromomethane	µg/L	8.6
Chloroform	µg/L	130
DDT (total)	µg/L	0.00017
1,4 Dichlorobenzene	µg/L	18
3,3'-Dichlorobenzidine	µg/L	0.0081
1,2-Dichloroethane	µg/L	28
1,1-Dichloroethylene	µg/L	0.9
Dichlorobromomethane	µg/L	6.2
Methylene Chloride	µg/L	450

Pollutant	Units	30-day Average
1,3-Dichloropropylene	µg/L	8.9
Dieldrin	µg/L	0.00004
2,4-Dinitrotoluene	µg/L	2.6
1,2-Diphenylhydrazine	µg/L	0.16
Halomethanes	µg/L	130
Heptachlor	µg/L	0.00005
Heptachlor Epoxide	µg/L	0.00002
Hexachlorobenzene	µg/L	0.00021
Hexachlorobutadiene	µg/L	14
Hexachloroethane	µg/L	2.5
Isophorone	µg/L	730
N-Nitrosodimethylamine	µg/L	7.3
N-Nitrosodi-n-Propylamine	µg/L	0.38
N-Nitrosodiphenylamine	µg/L	2.5
PAHs (total)	µg/L	0.0088
PCBs	µg/L	0.000019
TCDD Equivalents	µg/L	0.0000000039
1,1,2,2-Tetrachloroethane	µg/L	2.3
Tetrachloroethylene	µg/L	2
Toxaphene	µg/L	0.00021
Trichloroethylene	µg/L	27
1,1,2-Trichloroethane	µg/L	9.4
2,4,6-Trichlorophenol	µg/L	0.29
Vinyl Chloride	µg/L	36

Using the equation Ce = Co + Dm (Co – Cs), effluent limitations are calculated as follows for TCDD Equivalents and chronic toxicity.

Total Residual Chlorine

Ce = 2 + 114 (2 – 0) = 230 µg/L (6-Month Median)

Ce = 8 + 114 (8 – 0) = 920 µg/L (Daily Maximum)

Ce = 60 + 114 (60 – 0) = 6,900 µg/L (Instantaneous Maximum)

TCDD Equivalents

Ce = 3.9E-09 + 114 (3.9E-09 – 0) = 4.5E-07 µg/L (30-Day Average)

Chronic Toxicity

Ce = 1 + 114 (1 - 0) = 115 TUc (Daily Maximum)

Acute Toxicity

To determine an effluent limitation for acute toxicity, the Ocean Plan allows a mixing zone that is ten percent of the distance from the edge of the outfall structure to the edge of the chronic mixing zone (the zone of initial dilution); and therefore, the effluent limitation for acute toxicity is determined by the following equation:

Ce = Co + (0.1) Dm (Co)

Where Dm equals 114, the effluent limitation for acute toxicity is 3.75 TUa.

<u>Mass Based Effluent Limitations</u>

Implementing provisions at Section III. C of the Ocean Plan require that, in addition to concentration-based limits, effluent limitations for Table B pollutants be expressed in terms of mass. Therefore, the Order includes mass-based limits based on a flow rate of 1.5 MGD.

Table F-9. Summary of Water Quality-Based Effluent Limitations

Parameter	Units	Effluent Limitations			
		6-Month Median	30-Day Average	Daily Maximum	Instantaneous Maximum
Total Residual Chlorine	mg/L	0.23	--	0.92	6.9
TCDD Equivalents [1]	µg/L	--	0.00000045	--	--
Acute Toxicity	TUa	--	--	3.7	--
Chronic Toxicity	TUc	--	--	115	--

[1] TCDD Equivalents shall mean the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7.8-CDFs) multiplied by their respective toxicity factors, as listed in Appendix I of the 2009 Ocean Plan.

5. Whole Effluent Toxicity (WET)

Whole effluent toxicity (WET) limitations protect receiving water quality from the aggregate toxic effect of a mixture of pollutants in the effluent. WET tests measure the degree of response of exposed aquatic test organisms to an effluent. The WET approach allows for protection of the narrative “no toxics in toxic amounts” criterion while implementing numeric criteria for toxicity. There are two types of WET tests - acute and chronic. An acute toxicity test is conducted over a short time period and measures mortality. A chronic toxicity test is conducted over a longer period of time and may measure mortality, reproduction, and growth.

Central Coast Water Board staff have retained acute and chronic toxicity limitations from the previous permit. Further, the effluent limitations have been calculated based on a minimum probable initial dilution of 114 to 1.

The Discharger must also maintain a Toxicity Reduction Evaluation (TRE) Workplan, which describes steps that the Discharger intends to follow in the event that acute and/or chronic toxicity limitations are exceeded. When monitoring measures WET in the effluent above the limitations established by the Order, the Discharger must resample, if the discharge is continuing, and retest. The Executive Officer will then determine whether to initiate enforcement action, whether to require the Discharger to implement a Toxicity Reduction Evaluation, or to implement other measures.

D. Final Effluent Limitations

Final, technology-based and water quality-based effluent limitations established by the Order are discussed in the preceding sections of the Fact Sheet.

1. Satisfaction of Anti-Backsliding Requirements

The Order retains effluent limitations established by the previous permit for BOD_5, $CBOD_5$, TSS, oil and grease, settleable solids, turbidity, pH, total coliform, fecal coliform, enterococcus bacteria, total residual chlorine, acute toxicity and chronic toxicity.

Consequently, the Order does not contain effluent limitations or prohibitions that are less stringent than the previous permit and is consistent with the anti-backsliding requirements.

2. Satisfaction of Antidegradation Policy

The Order does not authorize increases in discharge rates or pollutant loadings, and its limitations and conditions otherwise assure maintenance of the existing quality of receiving waters. Therefore, provisions of the Order are consistent with applicable anti-degradation policy expressed by NPDES regulations at 40 CFR 131.12 and by State Water Board Resolution No. 68-16.

3. Stringency of Requirements for Individual Pollutants

This Order contains both technology-based and water quality-based effluent limitations for individual pollutants. The technology-based effluent limitations consist of restrictions on BOD_5; $CBOD_5$; TSS; settleable solids; turbidity; oil and grease; and pH. Restrictions on these pollutants are discussed in section IV. B of the Fact Sheet. This Order's technology-based pollutant restrictions implement the minimum, applicable federal technology-based requirements. In addition, this Order contains effluent limitations more stringent than the minimum, federal technology-based requirements that are necessary to meet water quality standards. These limitations are not more stringent than required by the CWA.

Final, technology and water quality-based effluent limitations are summarized in sections IV. B and C of this Fact Sheet.

E. Interim Effluent Limitations

The Order does not establish interim effluent limitations and schedules for compliance with final limitations. Interim limitations are authorized only in certain circumstances, when immediate compliance with newly established final water quality based limitations is not feasible.

F. Land Discharge Specifications – Not Applicable

G. Reclamation Specifications – Not Applicable

V. RATIONALE FOR RECEIVING WATER LIMITATIONS

A. Surface Water

Receiving water quality is a result of many factors, some unrelated to the discharge. This Order considers these factors and is designed to minimize the influence of the discharge on the receiving water. Receiving water limitations within the proposed Order include the receiving water limitations of the previous Order.

B. Groundwater

Groundwater limitations established by the Order include general objectives for groundwater established by the Basin Plan for the Central Coast Region.

VI. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

NPDES regulations at 40 CFR 122.48 require that all NPDES permits specify requirements for recording and reporting monitoring results. Water Code sections 13267 and 13383 also authorize the Central Coast Water Board to require technical and monitoring reports. Rationale for the monitoring and reporting requirements contained in the Monitoring and Reporting Program (MRP), which is presented as Attachment E of this Order, is presented below.

A. Influent Monitoring

In addition to influent flow monitoring, influent monitoring for BOD_5 and TSS is required to determine compliance with the Order's 85 percent removal requirement for those pollutants.

B. Effluent Monitoring

Effluent monitoring requirements of the previous permit for Discharge Point 001 (the Ocean outfall) are retained in this Order, except that monitoring for the Ocean Plan Table B pollutants, except TCDD equivalents which will be monitored annually, is required once per permit term. The Central Coast Water Board granted a revision to the monitoring frequency for the Ocean Plan Table B pollutants on January 6, 2010.

C. Whole Effluent Toxicity Testing Requirements

Whole effluent toxicity (WET) limitations protect receiving water quality from the aggregate toxic effect of a mixture of pollutants in the effluent. Acute toxicity testing measures mortality in 100 percent effluent over a short test period and chronic toxicity testing is conducted over a longer period of time and may measure mortality, reproduction, and/or growth. This Order retains acute and chronic WET limitations and monitoring requirements from the previous permit for Discharge Point 001.

D. Receiving Water Monitoring

1. Surface Water Monitoring

The Order retains the surface water receiving water monitoring from the previous permit.

2. Groundwater

Groundwater monitoring requirements are not established by the Order.

E. Other Monitoring Requirements

1. Biosolids/Sludge Monitoring.

Biosolids monitoring requirements are retained from the previous Order.

VII. RATIONALE FOR PROVISIONS

A. Standard Provisions

Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment D to the Order.

NPDES regulations at 40 CFR 122.41(a)(1) and (b - n) establish conditions that apply to all state-issued NPDES permits. These conditions must be incorporated into the permits either expressly or by reference. If incorporated by reference, a specific citation to the regulations must be included in the Order. 40 CFR 123.25(a)(12) allows the State to omit or modify conditions to impose more stringent requirements. In accordance with 40 CFR 123.25, this Order omits federal conditions that address enforcement authority specified in 40 CFR 122.41(j)(5) and (k)(2), because the enforcement authority under the Water Code is more stringent. In lieu of these conditions, this Order incorporates by reference Water Code Section 13387(e).

B. Special Provisions

1. Reopener Provisions

The Order may be modified in accordance with the requirements set forth at 40 CFR 122 and 124, to include appropriate conditions or limits based on newly available information, or to implement any, new State water quality objectives that are approved by the U.S. EPA. As effluent is further characterized through additional monitoring, and if a need for additional effluent limitations becomes apparent after additional effluent characterization, the Order will be reopened to incorporate such limitations.

2. Special Studies and Additional Monitoring Requirements

a. Toxicity Reduction Requirements

The requirement to maintain a Toxicity Reduction Work Plan is retained from Order No. R3-2007-0013. When toxicity monitoring measures acute or chronic toxicity in the effluent above the limitation established by the Order, the Discharger is required to resample and retest, if the discharge is continuing. When all monitoring results are available, the Executive Officer can determine whether to initiate enforcement action, whether to require the Discharger to implement toxicity reduction evaluation (TRE) requirements, or whether other measures are warranted.

3. Best Management Practices and Pollution Prevention

a. Pollutant Minimization Program

The 2009 California Ocean Plan establishes guidelines for the Pollutant Minimization Program (PMP). At the time of the proposed adoption of this Order no known evidence was available that would require the Discharger to immediately develop and conduct a PMP. The Central Coast Water Board will notify the Discharger in writing if such a program becomes necessary.

4. Construction, Operation, and Maintenance Specifications – Not Applicable

5. Special Provisions for Municipal Facilities (POTWs Only)

a. Biosolids Management

Provisions regarding sludge handling and disposal ensure that such activity will comply with all applicable regulations.

40 CFR 503 sets forth USEPA's final rule for the use and disposal of biosolids, or sewage sludge, and governs the final use or disposal of biosolids. The intent of this federal program is to ensure that sewage sludge is used or disposed of in a way that protects both human health and the environment.

USEPA's regulations require that producers of sewage sludge meet certain reporting, handling, and disposal requirements. As the USEPA has not delegated the authority to implement the sludge program to the State of California, the enforcement of sludge requirements that apply to the Discharger remains under USEPA's jurisdiction at this time. USEPA, not the Central Coast Water Board, will oversee compliance with 40 CFR 503.

40 CFR 503.4 (Relationship to other regulations) states that the disposal of sewage sludge in a municipal solid waste landfill unit, as defined in 40 CFR 258.2, that complies with the requirements in 40 CFR 258 constitutes compliance with section 405 (d) of the CWA. Any person who prepares sewage sludge that is disposed in a municipal solid waste landfill unit must ensure that the sewage sludge meets the applicable requirements of 40 CFR 503.

6. Other Special Provisions

a. Discharges of Storm Water

The Order does not address discharges of storm water from the treatment and disposal site, except to require coverage by and compliance with applicable provisions of General Permit No. CAS000001 - *Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities*.

b. Sanitary Sewer System Requirements

The Order requires coverage by and compliance with applicable provisions of General Waste Discharge Requirements for Sanitary Sewer Systems (State Water Board Order No. 2006-0003-DWQ). This General Permit, adopted on May 2, 2006, is applicable to all "federal and state agencies, municipalities, counties, districts, and other public entities that own or operate sanitary sewer systems greater than one mile in length that collect and/or convey untreated or partially treated wastewater to a publicly owned treatment facility in the State of California." The purpose of the General Permit is to promote the proper and efficient management, operation, and maintenance of sanitary sewer systems and to minimize the occurrences and impacts of sanitary sewer overflows.

7. Compliance Schedules

The Order does not establish interim effluent limitations and schedules of compliance with final limitations.

VIII. PUBLIC PARTICIPATION

The Central Coast Water Board is considering the issuance of waste discharge requirements (WDRs) that will serve as a National Pollutant Discharge Elimination System (NPDES) permit for the City of Scotts Valley Wastewater Treatment Facility. As a step in the WDR adoption process, the Central Coast Water Board staff has developed tentative WDRs. The Central Coast Water Board encourages public participation in the WDR adoption process.

A. Notification of Interested Parties

The Central Coast Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Notification was provided through the following: **the Scotts Valley Press Banner, a newspaper with regional circulation, beginning on October 26, 2012.**

B. Written Comments

Central Coast Water Board staff determinations are tentative. Interested persons are invited to submit written comments concerning these tentative WDRs. Comments must be submitted to the Executive Officer in person, via email (centralcoast@waterboards.ca.gov), or by mail at the address above on the cover page of this Order.

To receive a full response from the Central Coast Water Board staff and to be considered by the Central Coast Water Board, all written comments should be received at the Central Coast Water Board offices by 5:00 p.m. on **November 30, 2012.** Central Coast Water Board staff received no comments by the November 30, 2012 deadline.

C. Public Hearing

The Central Coast Water Board will hold a public hearing on the tentative WDRs during its regular Board meeting on the following date and time and at the following location:

Date:	**January 31-February 1, 2013**
Time:	**8:30 a.m.**
Location:	**Central Coast Water Board Offices** **895 Aerovista Place, Suite 101** **San Luis Obispo, CA 93401**

Interested persons are invited to attend.

Please be aware that dates and venues may change. Our Web address is http://www.waterboards.ca.gov/centralcoast/ where you can access the current agenda for changes in dates and locations.

D. Waste Discharge Requirements Petitions

Any aggrieved person may petition the State Water Resources Control Board to review the decision of the Central Coast Water Board regarding the final WDRs. The petition must be submitted within 30 days of the Central Coast Water Board's action to the following address:

State Water Resources Control Board
Office of Chief Counsel
P.O. Box 100, 1001 I Street
Sacramento, CA 95812-0100

E. Information and Copying

The Report of Waste Discharge (RWD), related documents, tentative effluent limitations and special provisions, comments received, and other information are on file and may be inspected at the address above at any time between 8:00 a.m. and 5:00 p.m., Monday through Friday. Copying of documents may be arranged through the Central Coast Water Board by calling (805) 549-3147.

F. Register of Interested Persons

Any person interested in being placed on the mailing list for information regarding the WDRs and NPDES permit should contact the Central Coast Water Board, reference this facility, and provide a name, address, and phone number.

G. Additional Information

Requests for additional information or questions regarding this Order should be directed to Michael Higgins at (805) 542-4649 (MHiggins@waterboards.ca.gov) or Sheila Soderberg at (805) 549-3592.

S:\NPDES\NPDES Facilities\Santa Cruz Co\City of Scotts Valley WWTP\R3-2013-0001\public draft\CA0048828 Scotts Valley_NPDES Permit Renewal_Draft.doc

Bill O'Brien

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION
81 Higuera Street
San Luis Obispo, California 93401

MASTER WATER RECYCLING REQUIREMENTS (PRODUCER) ORDER NO. 01-066

Waste Discharger Identification No. 3 449902003

Coliforms pg. 6

For

CITY OF SCOTTS VALLEY WASTEWATER TREATMENT PLANT
Santa Cruz County

The California Regional Water Quality Control Board, Central Coast Region, (hereafter the Regional Board) finds that:

SITE OWNER AND LOCATION

1. The City of Scotts Valley owns and operates a wastewater collection, treatment, disposal, and water recycling facility (hereafter referred to as the "Facility").

2. The Facility is located in the City of Scotts Valley at 700 Lundy Lane (See Attachments A and B).

PURPOSE OF ORDER

3. The primary objectives of this order are to: 1) Permit the reuse of tertiary treated domestic wastewater; 2) develop discharge limits; and 3) develop a monitoring program to evaluate the impact to water quality.

   [Note: Other prohibitions and conditions, definitions, and the method of determining compliance are contained in the attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements", dated January 1984. Applicable paragraphs are referenced in Provisions, Item C.11 of this Order.

   Throughout the Order superscripts (^{BP}) are provided to indicate requirements taken from the Water Quality Control Plan, Central Coastal Basin, (Basin Plan). Requirements not referenced are based on Regional Board staff's best professional judgment and recommendations from State and County Environmental Health agencies for protection of public health and the environment.]

SITE/FACILITY DESCRIPTION

Discharge Type

4. The Facility serves the commercial, industrial, and domestic sanitary wastewater needs of the City of Scotts Valley (hereafter the "City") and its vicinity. Commercial and Industrial users account for approximately 20% (15% commercial, 5% industrial) of the wastewater treatment plant flow. (The wastewater treatment facility, including wastewater pretreatment, collection, treatment, and disposal, is regulated under a separate Order No. 97-12 issued by the Regional Board and is not the subject of this Order.)

Design and Current Capacity

5. In September 1999, the City completed an upgrade that enables the Facility to produce up to 1.0 million gallons per day (MGD) of recycled water. The upgraded treatment unit includes coagulation/flocculation, filtration, denitrification, and disinfection.

6. The treatment unit receives secondary effluent and treats it to tertiary recycled water standards

in conformance with water recycling criteria contained in the California Code of Regulations, Title 22. The filtered wastewater is coagulated, as required under Section 60301.320(a) of the 2000 Water Recycling Criteria. Disinfection is achieved with a vertical low-pressure ultraviolet (UV) radiation system.

7. After tertiary treatment, the recycled water is stored in the on-site recycled water storage wet well. Tertiary treated effluent is delivered to the Scotts Valley Water District through an existing 8-inch effluent pipe to the distribution system.

8. The Facility will augment the water resource needs of the Scotts Valley Water District (hereafter referred to as the "Distributor") by supplying recycled water for distribution by the Distributor. Distribution by the Distributor is regulated under a separate Order No. 01-067 issued by the Regional Board and is not the subject of this Order.

MONITORING AND REPORTING PROGRAM (MRP)

9. The MRP requires influent monitoring, effluent monitoring, and system performance monitoring. No ground or surface water monitoring is proposed.

BASIN PLAN

10. The Water Quality Control Plan, Central Coastal Basin (Basin Plan), was adopted by the Regional Board on November 17, 1989, and approved by the State Water Resources Control Board on August 16, 1990. The Regional Board approved amendments of the Plan on February 11, 1994 and September 8, 1994. The Basin Plan incorporates statewide plans and policies by reference and contains a strategy for protecting beneficial uses of State waters. [BP]

11. Present and anticipated beneficial uses of Zayante Creek that could be affected by the discharge include: [BP]

    a. Municipal and Domestic Supply;
    b. Agricultural Supply;
    c. Ground Water Recharge;
    d. Industrial Service Supply;
    e. Water Contact Recreation;
    f. Non-Contact Water Recreation;
    g. Wildlife Habitat;
    h. Cold Freshwater Habitat;
    i. Migration of Aquatic Organisms;
    j. Spawning, Reproduction, and/or Early Development;
    k. Preservation of Biological Habitats of Special Significance;
    l. Rare, Threatened, or Endangered Species;
    m. Freshwater Replenishment; and
    n. Commercial and Sport Fishing.

12. Present and anticipated uses of groundwater in the vicinity of the discharge include: [BP]

    a. Domestic supply;
    b. Agricultural supply;
    c. Industrial process supply; and
    d. Industrial service supply.

13. The San Lorenzo Wastewater Management Plan (WWMP), adopted by Santa Cruz County Board of Supervisors, was approved by the Regional Board on April 5, 1995 as Resolution No. 95-04. The WWMP includes findings and recommendations resulting from investigation of elevated nitrate levels in surface water and groundwater in the San Lorenzo River watershed. The WWMP recommends the Regional Board require nitrogen control measures in the issuance of new or revised waste discharge requirements. The WWMP's goal is for at least 50 % reduction in nitrogen from onsite disposal systems. [BP]

14. This order requires 50 % reduction of nitrates in effluent, consistent with Resolution No. 95-04. [BP]

15. The surface water quality objectives specified in the Basin Plan for the Zayante Creek are: [BP]

Analyte	Value	Units
Total Dissolved Solids	500	mg/l
Sodium	40	mg/l
Chloride	50	mg/l
Boron	0.2	mg/l
Sulfate	100	mg/l

16. The range of median ground water quality objectives in the San Lorenzo Sub-Basin, as specified in the Basin Plan, are reported as follows: BP

Analyte	Range	Units
Total Dissolved Solids	100-250	mg/l
Sodium	10-20	mg/l
Chloride	20-30	mg/l
Nitrate (as N)	1-5	mg/l
Sulfate	10-50	mg/l

CEQA SUMMARY

17. These waste discharge requirements are for an existing facility and are exempt from the provisions of the California Environmental Quality Act (Public Resources Code, Section 21000, et seq.) in accordance with Section 15301, Chapter 3, Title 14, of the California Code of Regulations

EXISTING ORDERS AND GENERAL FINDINGS

18. Scott Hamby, Wastewater and Environmental Program Manager of the Scotts Valley Wastewater Treatment Plant (hereafter Producer) submitted a complete Report of Waste Discharge on February 18, 1999, in accordance with Section 13522.5 of the California Water Code (CWC). The report was filed for authorization to provide up to 1.0 MGD of disinfected tertiary recycled water for distribution by the Scotts Valley Water District (hereafter Distributor). The report constitutes consent by the Producer for the adoption of master water recycling requirements. The master water recycling requirements will become active upon the Producer's initial supplying of recycled water to the Distributor.

19. CWC Section 13512 states that it is the intention of the legislature that the State undertake all possible steps to encourage development of water recycling facilities so that recycled water may be made available to help meet the growing water demands of the State.

20. CWC Section 13523 provides that a regional board, after consulting with and receiving the recommendations of the State Department of Health Services, and if it determines such action to be necessary to protect the public health, safety, or welfare, shall prescribe water recycling requirements for water which is used or proposed to be used as recycled water. The use of recycled water could affect public health, safety, or welfare, and water recycling requirements for those uses are, therefore, necessary in accordance with the CWC.

21. In CWC Section 13550, the Legislature defines the use of potable domestic water for non-potable uses, including but not limited to cemeteries, golf courses, parks, highway landscaped areas, irrigation, and industrial uses as a waste or an unreasonable use of such water within the meaning of Section 2 of Article X of the California Constitution when suitable recycled water is available.

22. On July 14, 1992, the Governor approved Assembly Bill No. 3012 (AB 3012), which added Section 13523.1 to the CWC, and authorizes regional boards to issue master water recycling permits to a supplier and/or distributor of recycled water in lieu of prescribing water recycling requirements for a user of recycled water. AB 3012 also removes the requirement, except upon written request of a regional board, that the users file a report with a regional board to use recycled water from a supplier/distributor for whom a master water recycling permit has been issued. Similarly, AB 3012 exempts any such user of recycled water from the requirement to file a report with a regional board related to any material change in the character of the recycled water or its use. This Order is intended to be a master water recycling permit that is consistent with California Water Code (CWC) Section 13523.1.

23. CWC Section 13576(e) states that the use of recycled water has proven to be safe from a public health standpoint and that the State Department of Health Services (DHS) is updating regulations for the use of recycled water.

24. This Order's requirements conform with and implement the water recycling criteria of the

DHS (Title 22, Division 4, Chapter 3, Sections 60301-60355 of the California Code of Regulations [CCR]) to protect public health, safety, and welfare.

25. DHS's criteria for use of recycled water are contained in Title 22, Chapter 3, of the CCR. The Regional Board has consulted with the DHS regarding the regulation of this discharge.

26. Federal regulations require effluent limitations for all pollutants that are, or may be, discharged at a level that will cause or have reasonable potential to cause, or contribute to in-stream excursions above narrative or numerical water quality standards. Based on information submitted as part of the application, in studies, and as directed by monitoring and reporting programs, the Regional Board finds that the discharge does not have a reasonable potential to cause or contribute to an in-stream excursion above a water quality objective.

27. The authorized discharge of waste to waters of the State is a privilege, not a right. A permit and the privilege to discharge waste into waters of the State is conditional upon the discharge complying with provisions of Division 7 of the CWC, and of the Clean Water Act (as amended or as supplemented by implementing guidelines and regulations), and with any more stringent effluent limitations necessary to implement water quality control plans, protect beneficial uses, and prevent nuisance. Compliance with this Order should assure conditions are met and mitigate any potential changes in water quality due to the project.

28. On April 13, 2001, the Regional Board notified the Producer and interested persons of its intent to prescribe waste discharge requirements and water recycling requirements for the proposed discharges, and provided them with an opportunity for a public hearing and to submit their written views and recommendations.

29. The Regional Board, at a public meeting held July 13, 2001, heard and considered all comments pertaining to the discharge and found this Order consistent with the above findings.

IT IS HEREBY ORDERED, pursuant to authority in CWC Section 13377, that Scotts Valley Wastewater Treatment Plant, its agents, successors, and assigns, may discharge waste from its wastewater treatment plant providing it complies with the following:

A. PROHIBITIONS

1. The treatment, storage, distribution, or reuse of recycled water shall not create a nuisance as defined in CWC Section 13050(m).

2. Recycled water shall be confined to areas of authorized use without discharge to surface waters or drainage ways.

3. No recycled water shall be discharged from the treatment facilities, other than for irrigation reuse in accordance with this Order, Waste Discharge Requirements for the Producer, or for discharge to a municipal sewage collection system.
4. Personnel involved in producing, transporting, or using recycled water shall be informed of possible health hazards that may result from contact and use of recycled water.

5. Delivery of recycled water shall cease during any period that the water recycling specifications contained in or referred to by Order No. 01-066 cannot be met.

6. All recycled water reservoirs and other areas with public access, within the confines of the Scotts Valley Wastewater Treatment Facility, shall be posted (in English and Spanish) to warn the public that recycled wastewater is being stored or used.

7. Recycled water systems shall be properly labeled and regularly inspected to assure proper operation, absence of leaks, and absence of illegal connections within the Scotts Valley Wastewater Treatment Facility.

8. Recycled water shall not be impounded within 100 feet of any well used for domestic purposes.

9. There shall be no bypassing of untreated or partially treated wastewater from the recycled water plant or any intermediate unit processes to the on-site recycled water storage wet well.

10. Recycled water shall not be used for irrigation within 50 feet of any well used for domestic water supply, unless the user demonstrates to the Distributor that use area requirements of California Code of Regulations, Section 60310(a) are met.

B. RECYCLED WATER LIMITATIONS

1. The Producer shall ensure that treated effluent used for disinfected tertiary recycled water shall be an adequately oxidized, filtered, and disinfected water, as defined in California Code of Regulations (CCR) Title 22, Division 4, Chapter 3, Sections 60301-60335, or alternatively defined and approved by State Department of Health Services (DHS).

2. The Producer shall ensure the treated wastewater meets the following filtration requirements (based on the actual filtration process installed at the facility, and in accordance with recommendations by the DHS): Coagulation and flocculation processes shall be used at all times. Filtration of the treated wastewater shall be accomplished by using the TETRA Denite® System. The filter loading rate shall not exceed 2.6 gallons per minute per square foot (except during backwash events) and shall not exceed 5.0 gallons per minute per square foot at any time. During filter bumping, filtered water shall be diverted into the spent backwash water line.

3. The Producer shall ensure treated wastewater meets the following disinfection requirements (based on the actual UV disinfection process installed at the facility, and in accordance with recommendations by the DHS): Disinfection of tertiary treated wastewater shall be accomplished by using the Aquaray® 40 VLS System. A minimum of two UV modules shall be operated simultaneously. The delivered UV dose for disinfection shall not be less than 100 milliJoules per square centimeter. The operational UV dose equivalent to a delivered dose of 100 milliJoules per square centimeter shall be in accordance with the Operation Plan (comprised of the Engineering Report and the Operation and Maintenance Manual), as approved by DHS. Filtered water transmittance shall not be less than 55 percent. Water level in the disinfection channel shall not exceed 60 inches.

4. The Producer shall discontinue delivery of recycled water to Distributor during any period which it has reason to believe that the limits established in Section B of this Order are not being met. The delivery of recycled water shall not be resumed until all conditions that caused the limits to be violated have been corrected.

5. The State Department of Health Services revised and finalized Title 22 regulations for water reuse in 2000. The Regional Board Executive Officer may authorize changes to the restricted and unrestricted recycled water uses consistent with those regulations.

6. Maximum daily flow volumes shall not exceed 1.0 MGD.

7. Recycled water shall not have turbidity which exceeds the following limits:

   a. Daily average turbidity must be less than or equal to 2 NTU;

   b. Turbidity shall not exceed 10 NTU at any time; and

   c. Turbidity shall not exceed 5 NTU for more than five percent of the time within a 24-hour period.

8. Tertiary treated recycled water shall not exceed the limits of Table 1.

Table 1- Disinfected Tertiary Recycled Water Limits (mg/l)

Parameter	Daily Max	30-Day Mean	7-Day Mean
BOD_5	20	10	--
Total Suspended Solids	20	10	--
Nitrate as N	10	9	--

9. Total Nitrogen in wastewater shall be reduced by at least 50 percent prior to subsurface disposal. [BP] Compliance will be determined from samples taken at points before and after extended treatment.

10. Recycled water shall not contain total coliform concentrations exceeding the following limits:

    a. The seven-day median concentration must not exceed a Most Probable Number (MPN) of 2.2/100 ml;

    b. Concentrations must not exceed a MPN of 23/100 ml in more than one sample taken over a 30-day period; and

    c. Concentrations must be less than a MPN of 240/100 ml at all times.

C. PROVISIONS

1. This Order supersedes the Regional Board's October 29, 1997 temporary approval of secondary treated wastewater for construction uses.

2. The Producer will be responsible for ensuring that recycled water meets the quality standards of this Order. The Distributor will be responsible for the application of recycled water on their respective use areas and associated operations and maintenance.

3. The Producer shall maintain in good working order and operate as efficiently as possible, any facility or control system installed by the Producer to achieve compliance with the water recycling requirements.

4. The Producer and its employees shall receive training to assure proper operation of water recycling facilities, worker protection, and compliance with this Order.

5. The Producer shall assure that backflow preventers, located within the Scotts Valley Wastewater Treatment Facility, are in proper working order by testing initially and annually thereafter, in accordance with California Code of Regulations Title 17, Section 7605. Reports of testing and maintenance shall be maintained by the Producer.

6. The Producer shall assure that all above-ground equipment, including pumps, piping, storage reservoir, valves, etc. at the Scotts Valley Wastewater Treatment Facility, which may at any time contain recycled water, shall be adequately and clearly identified with warning signs.

7. The Producer shall provide disinfection of the filtered wastewater in accordance with an Operation Plan (Comprised of the Engineering Report and the Operation and Maintenance Manual). Changes to the Operation Plan shall be submitted to the California Department of Health Services (DHS) for review and approval prior to implementation.

8. The Producer shall submit a revised Engineering Report to DHS for review and approval prior to any modification of the treatment processes or expansion of treatment plant capacity.

9. The production, distribution, and use of recycled water shall comply with the Engineering Report as approved by the Regional Board and DHS.

10. The Producer shall permit the Regional Board or its authorized representative in accordance with California Water code section 13267(c):

    - Entry upon premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of the Order;

    - Access to and copy of any records that must be kept under conditions of this Order;

    - Inspection of any facility, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order;

- To photograph, sample, and monitor for the purpose of assuring compliance with this Order.

11. The Producer shall comply with all items of the attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements," dated January 1984 (also referred to as "Standard Provisions"), except Item Nos. A.11, A.14, and A.15.

12. The Producer shall comply with "Monitoring and Reporting Program No. 01-066," as specified by the Regional Board Executive Officer.

13. The Regional Board will revise this Order periodically and may revise these requirements when necessary.

14. Pursuant to Title 23, Division 3, Chapter 9 of the California Code of Regulations, the Discharger must submit a written report to the Regional Board Executive Officer not later than July 1, 2009 addressing:
    a. Whether there will be changes in the continuity, character, location, or volume of the discharge; and

    b. Whether, in the Discharger's opinion, there is any portion of the Order that is incorrect, obsolete, or otherwise in need of revision.

I, Roger W. Briggs, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Coast Region on July 13, 2001.

Executive Officer

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Task: 121-01
File: Discharger file; Scotts Valley WWTP, Master Reclamation Requirements

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION
81 Higuera Street
San Luis Obispo, California 93401

MASTER WATER RECYCLING REQUIREMENTS (DISTRIBUTOR) ORDER NO. 01-067

Waste Discharger Identification No. 3 449902002

For

SCOTTS VALLEY WATER DISTRICT
Santa Cruz County

The California Regional Water Quality Control Board, Central Coast Region, (hereafter the Regional Board) finds that:

SITE OWNER AND LOCATION

1. The Scotts Valley Water District (hereafter the "Distributor") owns and operates a recycled water storage and distribution system.

2. The distribution system is located in the City of Scotts Valley (see Attachment A).

PURPOSE OF ORDER

3. The primary objectives of this order are to: 1) regulate the reuse of tertiary treated domestic wastewater; 2) develop discharge limits; and 3) develop a monitoring program to evaluate potential impacts to water quality.

   [Note: Other prohibitions and conditions, definitions, and the method of determining compliance are contained in the attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements", dated January 1984. Applicable paragraphs are referenced in Provisions, Item C.3 of this Order.

   Throughout this Order superscripts (^{BP}) are provided to indicate requirements taken from the Water Quality Control Plan, Central Coastal Basin, (Basin Plan).

   Requirements not referenced are based on Regional Board staff's best professional judgment and recommendations from State and County Environmental Health agencies for protection of public health and the environment.]

SITE/FACILITY DESCRIPTION

Discharge Type

4. The Distributor proposes distributing recycled water from the Scotts Valley Wastewater Treatment Plant (hereafter Producer) tertiary treatment facility to users throughout the City of Scotts Valley and its vicinity (Attachment B and C).

Design and Current Capacity

5. The Producer received financing from the Distributor to upgrade the existing wastewater treatment plant to produce a tertiary effluent suitable for approved irrigation reuse. The Producer's treatment facility is regulated under Order No. 01-066, "Master Water Recycling Requirements for City of Scotts Valley Wastewater Plant, Santa Cruz County". Order No. 01-066 requires that the Producer treat wastewater to a level prescribed by Title 22 of

the California Code of Regulations, State Department of Health Services, and the uniform statewide water recycling criteria established pursuant to California Water Code Section 13521, for the following applications:

a. Irrigation of Landscape;
   - Parks and Playgrounds
   - School Yards
   - Golf Courses
   - Cemeteries
   - Freeways
   - Nursery and Sod Farms

b. Irrigation of Food Crops;

c. Irrigation of Pastures; and

d. Supply for Impoundments
   - Recreational Impoundments
   - Landscape Impoundments

6. Maximum daily flow of up to 1.0 million gallons per day (MGD) can be treated by the Producer and made available to the Distributor for approved uses for recycled water.

7. The Distributor will authorize future specific reuse projects on a case-by-case basis in accordance with the approved permit-based program of Rules and Regulations for Recycled Water Customers (Article 8 of Scotts Valley Water District's Ordinance 119-96). The Distributor will use existing and proposed transmission facilities as shown in Attachment B to transport recycled water to Users. The Distributor will also design and incrementally install recycled water transmission facilities to serve other future projects.

Geology

8. The City of Scotts Valley is located over the Scotts Valley Syncline. The area is underlain by seven major geologic units (Purisima Formation, Monterey Formation, Lompico Sandstone, Santa Cruz Mudstone, Santa Margarita Sandstone, Granite, and Alluvium).

Surface and Groundwater

9. Two surface water bodies flow through Scotts Valley – Bean and Carbonera Creeks.

10. The Scotts Valley Water District (SVWD) derives its water supply solely from ground water.

11. Two major aquifers in the SVWD distribution area (hereafter referred to as the basin) are the Santa Margarita Sandstone and Lompico Sandstone.

12. All water entering the ground water basin is derived from precipitation. Water discharging from the basin includes seeps and springs, surface flow through Bean and Carbonera Creeks, and ground water pumpage.

13. Ground water flow is generally in a North-West direction as shown on Attachment D.

14. Ground water depth varies from approximately 350° to 650° across the basin. Well locations and water levels are shown on Attachment D.

15. SVWD has documented Total Dissolved Solids (TDS) in Well 9 since the mid-1980's. The ground water TDS has ranged between 300 and 500 milligrams per liter.

A. MONITORING AND REPORTING PROGRAM (MRP)

16. The MRP requires effluent monitoring, and system performance monitoring. No ground or surface water monitoring is proposed.

BASIN PLAN

17. The Water Quality Control Plan, Central Coastal Basin, (Basin Plan) was adopted by the Regional Board on November 17, 1989 and approved by the State Board on August 16, 1990. Amendments and revisions to the plan were approved by the Regional Board on September 8, 1994. The Basin Plan incorporates statewide plans and policies by reference and contains a strategy for protecting beneficial uses of State waters.

18. Existing and anticipated beneficial uses of ground water in the vicinity of the discharge include:

a. Domestic water supply;
b. Agricultural water supply;
c. Industrial process supply; and
d. Industrial service supply.

19. Present and anticipated beneficial uses of Bear Creek that could be affected by the discharge include:

a. Municipal and Domestic Supply;
b. Agricultural Water Supply;
c. Groundwater Recharge;
d. Industrial Service Supply;
e. Water Contact Recreation;
f. Non-Contact Water Recreation;
g. Wildlife Habitat;
h. Cold Freshwater Habitat;
i. Migration of Aquatic Organisms;
j. Spawning, Reproduction, and/or Early Development;
k. Preservation of Habitats of Special Significance;
l. Rare, Threatened, or Endangered Species;
m. Freshwater Replenishment; and
n. Commercial and Sport Fishing.

20. The surface water quality objectives specified in the Basin Plan for the Zayante Creek, are: [BP]

Analyte	Value	Units
Total Dissolved Solids	500	mg/l
Sodium	40	mg/l
Chloride	50	mg/l
Boron	0.2	mg/l
Sulfate	100	mg/l

21. The range of median ground water quality objectives in the San Lorenzo Sub-Basin, as specified in the Basin Plan, are reported as follows: [BP]

Analyte	Range	Units
Total Dissolved Solids	100-250	mg/l
Sodium	10-20	mg/l
Chloride	20-30	mg/l
Nitrate (as N)	1-5	mg/l
Sulfate	10-50	mg/l

22. The San Lorenzo Wastewater Management Plan (WWMP), adopted by Santa Cruz County Board of Supervisors, was approved by the Regional Board on April 5, 1995 as Resolution No. 95-04. The WWMP includes findings and recommendations resulting from investigation of elevated nitrate levels in surface water and groundwater in the San Lorenzo River watershed. The WWMP recommends the Regional Board require nitrogen control measures in the issuance of new or revised waste discharge requirements. The WWMP's goal is for at least 50 % reduction in nitrogen from onsite disposal systems. [BP]

CEQA SUMMARY

23. The Scotts Valley Water District certified a final Environmental Impact Report on February 22, 1999 in accordance with the California Environmental Quality Act (Public Resources Code, Section 21000, et seq.) and the CCR.

EXISTING ORDERS AND GENERAL FINDINGS

24. Jon Sansing, General Manager for Scotts Valley Water District (Distributor), submitted a complete Report of Waste Discharge on February 18, 1999, in accordance with California Water Code Section 13522.5. The report was filed for authorization to distribute recycled water within the City of Scotts Valley and its vicinity. The report constitutes consent by the proposed permittee for adoption of a master water recycling permit. This master water recycling permit will become valid upon the Distributor's initial receipt of recycled water.

25. The Distributor has agreed to adopt a water recycling planning document designating current and potential areas for recycled water use. The planning document will be reviewed and updated as needed. The planning document will include, but not be limited to, plants and facilities, recycled water service areas, recycled water quality, and/or implementation schedules. Attachment C illustrates proposed users and possible future users upon completion of the tertiary treatment process at the Scotts Valley Wastewater Treatment Plant (Producer). Table 5-1 (Attachment C of this Order) defines present and future users.

26. Users will document compliance with all conditions of this Order and of Title 17 and Title 22 of the California Code of Regulations. Each User shall conduct self-monitoring and submit documentation annually to the Distributor as per the Recycled Water User's Self-Monitoring Report constructed by the Distributor. Users will demonstrate to the Distributor the absence of cross-connections before being issued a permit. The Scotts Valley Water District's Water Recycling Program will be the lead agency for conducting cross-connection testing. The Distributor will maintain this information at its facility.

27. The Distributor will provide oversight and control recycled water distribution by users in the City of Scotts Valley and its vicinity through the *Scotts Valley Water District Water Recycling Program Rules and Regulations for Recycled Water Customers*. The Distributor agrees that facilitation of recycled water use is best addressed by a master water recycling permit adopted by the Regional Board.

28. It is policy, as defined in California Water Code (CWC) Section 13512, that the state undertake all possible steps to encourage development of water recycling facilities so that recycled water may be made available to help meet growing water requirements of the state. Both the Producer and Distributor have expended resources toward the development of recycled water treatment and distribution facilities. This master water recycling permit will facilitate utilization of recycled water to the fullest extent possible, while providing adequate protection of public health and reducing the regulatory burden of present and future recycled water users.

29. CWC Section 13523 provides that a regional board may consult with the State Department of Health Services (DHS), and determine if action is necessary to protect public health, safety, or welfare. If such a determination is made, the Regional Board shall prescribe water recycling requirements for water that is used, or proposed to be used, that protect public health. In accordance with the CWC, the use of recycled water could affect public health, safety, or welfare. Water recycling requirements, therefore, are necessary for those uses.

30. On July 14, 1992, the Governor approved Assembly Bill No. 3012 (AB 3012), which added Section 13523.1 to the CWC, and authorizes regional boards to issue master water recycling permits to a supplier and/or distributor of recycled water in lieu of prescribing recycled water requirements for a user of recycled water. AB 3012 also removes the requirement, except upon written request of a regional board, that the users file a report with a regional board to use recycled water from a supplier/distributor for whom a master recycling permit has been issued. Similarly, AB 3012 exempts any such user of recycled water from the requirement to file a report with a regional board related to any material change in the character of the recycled water or its use. This Order is intended to be a master water recycling permit that is consistent with California Water Code (CWC) Section 13523.1.

31. In CWC Section 13550, the Legislature defines the use of potable domestic water for non-potable uses, including but not limited to cemeteries, golf courses, parks, highway landscaped areas, irrigation, and industrial uses as a waste or an unreasonable use of such water within the meaning of Section 2 of Article X of the California Constitution when suitable recycled water is available.

32. CWC Section 13576(e) states that the use of recycled water has been proven to be protective of public health, and that the DHS is updating regulations for the use of recycled water.

33. This Order's requirements conform with and implement the water recycling criteria of the DHS (Title 22, Division 4, Chapter 3, Sections 60301-60355 of the California Code of Regulations [CCR]) to protect public health, safety, and welfare.

34. DHS criteria for use of recycled water are contained in Title 22, Chapter 3, of the CCR. The Regional Board has consulted with DHS regarding regulation of this discharge.

35. Discharge of waste is a privilege, not a right, and authorization to discharge is conditional upon the discharge complying with provisions of Division 7 of the CWC and any more stringent effluent limitations necessary to implement water quality control plans, to protect beneficial uses, and to prevent nuisance. Compliance with this Order should assure this and mitigate any potential adverse changes in water quality due to the discharge.

36. On April 13, 2001, the Regional Board notified the Distributor and interested persons of its intent to issue Master Water Recycling requirements, provided them with an opportunity to submit their written views and recommendations, and scheduled a public hearing.

37. After considering all comments pertaining to this discharge during a public hearing on July 13, 2001, this Order was found consistent with the above findings.

IT IS HEREBY ORDERED, pursuant to authority in CWC Section 13523.1, that the Scotts Valley Water District, its agents, successors, and assigns, may distribute recycled water for irrigation, supply of impoundments, and other approved uses, providing they comply with the following:

PROHIBITIONS

1. Discharge of recycled water that degrades water quality and/or impacts beneficial uses of water is prohibited.

2. Discharge to other than approved recycling areas is prohibited (see the attached Standard Provisions and Reporting Requirements, General Permit Condition A.6).

3. No recycled water used for irrigation shall be applied during periods of rainfall or when soils are saturated such that runoff occurs.

4. No recycled water used for irrigation shall be allowed to escape to areas outside the designated use areas by surface flow or by airborne spray.

5. Recycled water shall be confined to areas of authorized use without discharge to surface waters or drainageways.

6. Spray, mist, or runoff shall not enter a dwelling or food handling facility, and shall not contact any drinking fountain, or designated outdoor eating areas.

7. There shall be no cross-connections between the potable water supply and pipes containing recycled water. Supplementing recycled water with water used for domestic supply shall not be allowed except through an air-gap separation. In accordance with California Code of Regulations (CCR) Title 17, Section 7604, a reduced pressure principle backflow device shall be provided at premises where recycled water is used and there is no interconnection with the potable water system. For individual residences using recycled water for landscape irrigation as part of an approved dual plumbed use area as defined in CCR Title 22, Section 60313, a double check shall be used unless the Distributor obtains State Department of Health Services (DHS) approval to use an alternate backflow protection plan that includes an annual inspection and annual shutdown test of the recycled water and potable water systems.

8. Personnel involved in producing, transporting, or using recycled water shall be informed of possible health hazards that may result from contact and use of recycled water.

9. Delivery of recycled water shall cease during any period that the water recycling specifications contained in or referred to by Order No. 01-067 cannot be met.

10. Spray irrigation of recycled water shall be accomplished at a time and in a manner to minimize ponding and the possibility of public contact with sprayed materials.

11. All recycled water reservoirs and other areas with public access shall be posted (in English and Spanish) to warn the public that recycled water is being stored or used.

12. Recycled water systems shall be properly labeled and regularly inspected to assure proper operation, absence of leaks, and absence of illegal connections.

13. Recycled water shall not be impounded within 100 feet of any well used for domestic purposes.

14. Hydraulic and constituent (Nitrogen, etc.) loading rates for recycled water uses shall be based on crop consumption and tolerance and shall not exceed what is reasonable for production of the crop.

15. Delivery of inadequately treated recycled water is prohibited.

16. Recycled water shall not be used for irrigation within 50 feet of any well used for domestic water supply, unless the user demonstrates to the Distributor that use area requirements of California Code of Regulations, Section 60310(a) are met.

B. MASTER WATER RECYCLING SPECIFICATIONS

1. The Distributor shall comply with the uniform statewide water recycling criteria established pursuant to California Water Code (CWC) Section 13521.

2. The Distributor and Users shall receive employee training to assure proper operation of water recycling facilities, worker protection, and compliance with this Order. In accordance with CCR Title 17, Section 7586, each User shall designate a Recycled Water Supervisor responsible for operation and maintenance of the recycled water system, and its continued compliance with permit conditions.

3. The Distributor shall assure that all above-ground equipment, including pumps, piping, storage reservoir, valves, etc. which may at any time contain recycled water shall be adequately and clearly identified with warning signs. The Distributor shall make all necessary provisions to inform the public that the liquid being distributed is recycled water and is unfit for human consumption.

4. The Distributor shall establish the *Scotts Valley Water District Water Recycling Program Rules and Regulations for Recycled Water Customers,* governing the design and construction of recycled water use facilities and the use of recycled water in accordance with the uniform statewide recycling criteria established pursuant to CWC Section 13521, and subject to the DHS and Regional Board Executive Officer review and approval. Changes to the *Scotts Valley Water District Water Recycling Program Rules and Regulations for Recycled Water Customers*, as approved on April 19, 2000 by the State Department of Health Services (DHS), shall be submitted to the DHS and the Regional Board Executive Officer for review and approval prior to implementation.

5. Recycled Water Use permits, issued by the Distributor in accordance with approved rules and regulations, form the basis of permitted recycled water use by specific Users. Recycled Water Use permits shall specify self-monitoring requirements for each User.

6. A copy of the Recycled Water Use permit and this Order must be provided to the Users by the Distributor. The Users must have these documents available at all times for inspection by Regional Board staff, the Distributor, or State/County Health Officers.

7. The Distributor is responsible for collecting reports from Users. Users are responsible for submitting on-site observation reports and use data to the Distributor, who will compile and file self-monitoring reports with the Regional Board. The Distributor, at its discretion, may assume the User's responsibility for on-site observation reports and use data.

8. The Distributor shall establish and enforce rules or regulations for recycled water users, governing the design and construction of recycled water use facilities and the use of recycled water, in accordance with the uniform statewide water recycling criteria established

pursuant to California Water Code (CWC) Section 13521.

9. The Distributor shall conduct periodic inspections of recycled water user facilities to monitor compliance by Users with the uniform statewide water recycling criteria established pursuant to CWC Section 13521 and the requirements of this Master Water Recycling Requirements Order.

10. Pursuant to CWC Section 13523.1(b)(4), the Distributor shall submit quarterly reports to the Regional Board summarizing recycled water use, including the total amount of recycled water supplied, the total number of recycled water use sites, and the locations of those sites, including the names of the hydrologic areas underlying the recycled water use sites.

11. The Distributor shall comply with the mitigative measures and plan and schedule contained in Table 4-2 of *Engineering Report for Scotts Valley Water Recycling Project*, dated January 2001.

C. PROVISIONS

1. The Distributor shall comply with "Monitoring and Reporting Program No. 01-067," as specified by the Regional Board Executive Officer.

2. Use of recycled water not addressed by the uniform statewide water recycling criteria shall be considered on a case-by-case basis and require approval by the Regional Board Executive Officer.

3. The Distributor shall comply with all items of the attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements," dated January 1984 (also referred to as "Standard Provisions"), except Item Nos. A.8, A.14, A.15, and A.17.

4. Pursuant to Title 23, Division 3, Chapter 9, of the California Code of Regulations, the Distributor must submit a written report to the Regional Board Executive Officer not later than July 1, 2009, addressing:

   a. Whether there will be changes in the continuity, character, location, or volume of the discharge; and

   b. Whether, in the Distributor's opinion, there is any portion of the Order that is incorrect, obsolete, or otherwise in need of revision.

5. The Distributor shall notify the Regional Board Executive Officer of any recycled water use that is not in compliance with the provisions of this Order. Such use shall constitute adequate grounds to initiate action for administrative civil liability, pursuant to California Water Code (CWC) Section 13323, or to request that the Attorney General take appropriate enforcement action against users pursuant to CWC Section 13350.

I, Roger W. Briggs, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Coast Region, on July 13, 2001.

Roger Briggs

Executive Officer

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Task: 121-01
File: Discharger file; Scotts Valley WD, Master Reuse Requirements

STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION
81 Higuera Street
San Luis Obispo, California 93401

MONITORING AND REPORTING PROGRAM NO. 01-067
Waste Discharger Identification No. 3 449902002

For

SCOTTS VALLEY WATER DISTRICT
DISTRIBUTOR OF RECYCLED WATER
Santa Cruz County

I. RECYCLED WATER MONITORING

The quantity of recycled water distributed to reuse sites shall be metered daily.

The Scotts Valley Water District (District) shall:

1. Document all sites receiving/using recycled water (include months of use).

2. Provide user guidelines to all recycled water users (Users), including the *Scotts Valley Water District Water Recycling Program Rules and Regulations for Recycled Water Customers* (Rules and Regulations).

3. Instruct all District employees who are routinely in the field, such as water meter readers, to report unauthorized irrigation activities and runoff from recycled water use areas to the District's Water Recycling Inspector. If it is determined that the irrigation is unauthorized, the inspector shall notify the Site Supervisor and the Regional Water Quality Control Board, Central Coast Region (Regional Board) by telephone within 24 hours, followed by a written report within 15 days describing the corrective action taken.

4. Set individual Recycled Water Customer monitoring requirements based on the site characteristics (i.e., size, volume used, complexity, etc.) of each use area, and ensure the Recycled Water Customer self-monitoring is conducted, at a minimum, annually.

5. Conduct periodic (at least quarterly) scheduled or random inspections of the Recycled Water Customers to ensure compliance with the Rules and Regulations. Inspections shall be performed when recycled water is being used and shall include, at a minimum:

   a. Visual inspection of all back-flow prevention devices, pump rooms, exposed piping, valves, pressure-reducing stations, points of connection, sprinklers, drip system emitters, controllers, lakes, storage facilities, signs, labeling, tags, etc.

   b. Interviews with each Recycled Water Customer Supervisor to: 1) determine whether system modifications and maintenance have been properly conducted; 2) solicit their assessment of system peculiarities; and 3) verify employee training.

c. Inspection of maintenance records to review all maintenance since the last inspection.

d. Review of the monthly recycled water meter readings to identify unusual usage behavior, with follow-up investigations if patterns change dramatically.

The District shall report unusual occurrences to the Regional Board within 48 hours of the inspection. Written confirmation describing the unusual occurrences, and the corrective action taken in response to the unusual occurrences, shall be submitted to the Regional Board no later than 15 days after the inspection.

Note that if no recycled water is used/applied at a site, no physical inspection is required.

6. Require the Users to conduct a complete inspection of all irrigation lines, sprinklers, and emitters at least once each year during the dormant season. A report of the findings of these inspections, including descriptions of any significant repairs or modifications made to the distribution systems, shall be submitted in the annual report (due February 1 of each year).

7. Perform a cross-connection test at each reuse site every four years.

II. STANDARD OBSERVATIONS

For each reuse site, document the following standard observations:

1. Runoff – Document evidence of recycled water runoff from each site. If runoff occurs, documentation shall include, at a minimum, a sketch of the affected area, the water bodies impacted by the runoff, and estimated runoff volume.

2. Odor – Document evidence of odors resulting from the application of recycled water at each site. If odors are present, documentation shall include, at a minimum, the apparent source, characterization of the odors, the odor's direction of travel, and any public use areas or offsite facilities affected by the odors.

3. Ponding – Document evidence of recycled water ponding, and/or evidence of mosquitoes breeding within the recycled water use site due to ponded water.

4. Failure – Document evidence of:

    - Leaks or breaks in system pipelines or tubing.

    - Plugged, broken, or otherwise faulty system emitters or sprinklers.

5. Public Notification – Properly post signs to inform the public that recycled water is being used and is not safe for drinking.

6. Land Observation Stations – Define station locations at a sufficient number of points in order to ensure compliance with all applicable recycled water requirements.

7. Impoundment Facilities Observation Stations – Define station locations at points along the periphery of each impoundment or pond (e.g., storage, ornamental, golf course, etc.).

III. RECYCLED WATER DISTRIBUTION SYSTEM

The District shall monitor the entire recycled water distribution system. This includes, but is not limited to, bi-annual inspections (June and September of each year) of pump stations, storage reservoirs, secondary transmission mains, and pipeline extensions. This information shall be included in the appropriate quarterly reports.

IV. REPORTING

The District shall submit quarterly reports summarizing recycled water use, including, but not limited to, the total volume of recycled water supplied, the total number of recycled water use sites, and recycled water use site locations, including the names of the hydrologic areas underlying the recycled water use sites. Reports shall include records of the User's reuse site inspections, results of the cross-connection tests, and recycled water storage tank monitoring results. Reports shall also include recycled water distribution system inspection information.

Reports shall be submitted by the first day of February, May, August, and November following the end of the preceding quarter (e.g., the 4th quarter monitoring report is due no later than February 1).

Ordered by: [signature]
Executive Officer

Date: 7-19-01

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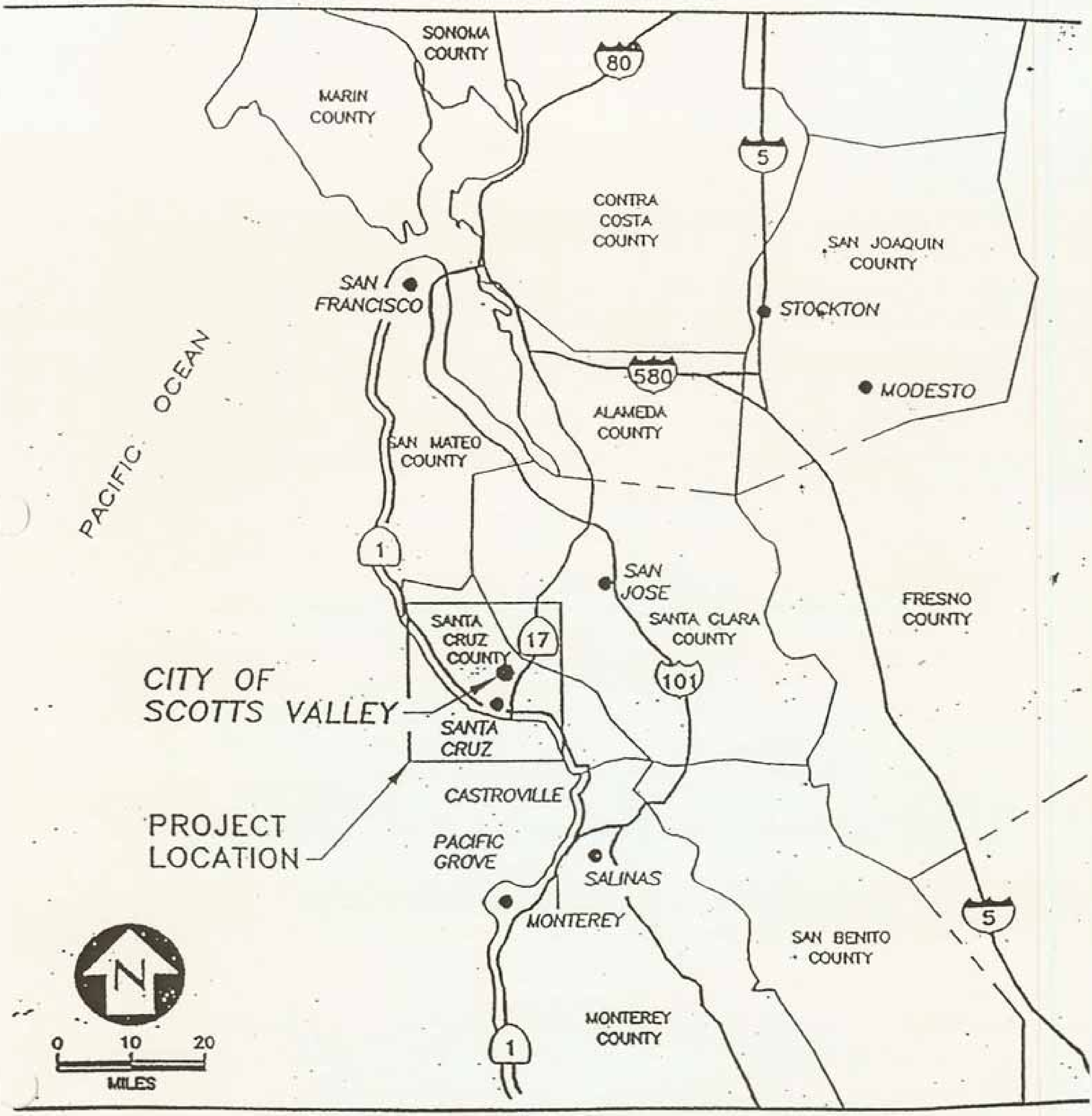
Task: 121-01
File: Discharger file; Scotts Valley WD, Master Reuse Requirements

ATTACHMENT A



VICINITY MAP

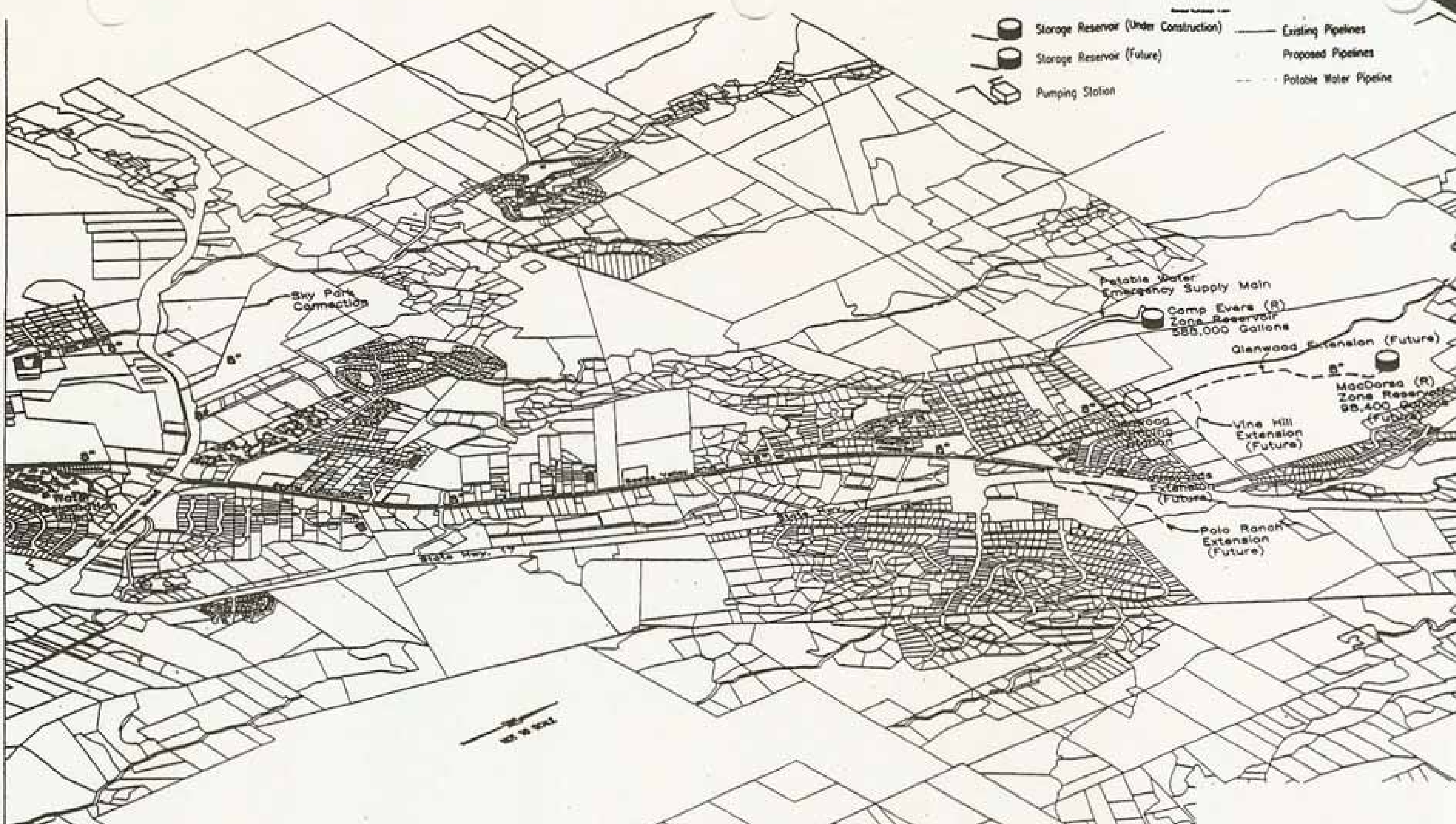
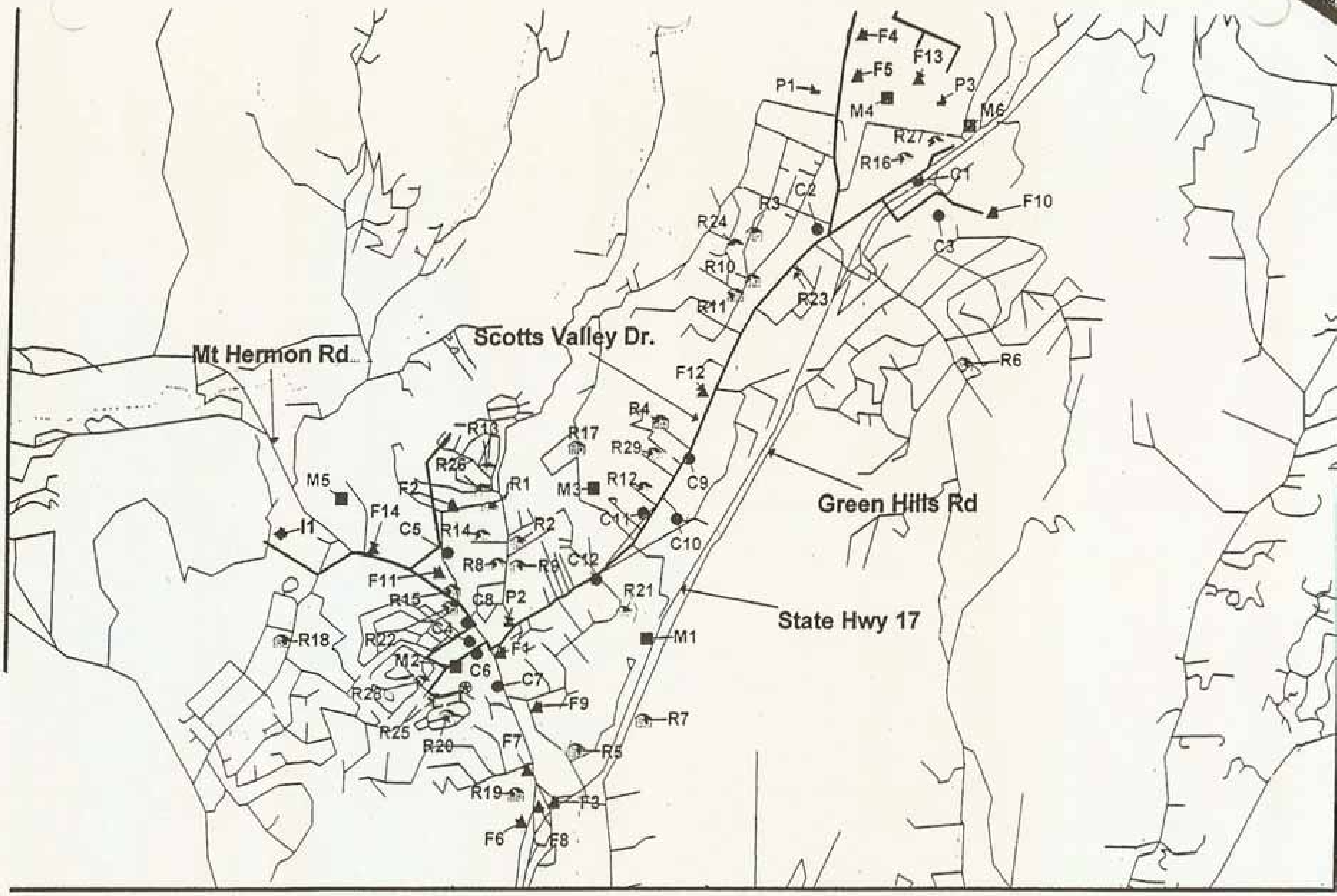


FIGURE 4-1
RECLAIMED WATER SYSTEM MASTER PLAN
RECOMMENDED PRIORITY 1
DISTRIBUTION SYSTEM

Attachment B



SVWD Water Recycling Program - Engineering Report
Location of Present Users and Future Users

Figure 5-1

Attachment B-1

TABLE 5-1
POTENTIAL RECYCLED WATER USERS
IRRIGATION DEMANDS

User ID	Customer	Address	Reference for Water Use Estimate		DEMAND ESTIMATE Annual (AFY)	Annual (gal/year)	Average (gpd)	Peak Month (gpd)
R1	Bean Creek HOA	311 Bean Creek Rd	1996 Report	metered	2.01	655,800	1,800	4,000
R2	Bean Creek Villas HOA	203 Bean Creek Rd	1996 Report	metered	1.03	334,500	900	2,600
R3	Country Terrace HOA	2 Fox Sparrow Ct	1996 Report	metered	6.43	2,096,000	5,700	8,900
R4	Dunslee Way HOA	29 Dunslee Way	1996 Report	metered	0.57	185,000	500	1,400
R5	Glen Canyon HOA	25 Sunridge Court	1996 Report	estimate	0.9	299,000	800	1,800
R6	Granite Creek Estate HOA	0 Lauren Circle	1996 Report	estimate	0.2	50,000	100	300
R7	Green Hills Estates HOA	Sidesaddle Cr./Elzer Drive	1997-98 Avg.	metered	5.49	1,789,100	5000	13,000
R8	Hidden Oaks HOA	111 Bean Creek Rd	1995-1998 Avg.	metered	14.55	4,741,000	13,000	32,000
R9	Hidden Pine HOA	146 Bean Creek Rd	1996 Report	metered	0.65	212,000	600	1,200
R10	Ken Bergman, Residential Property	104 San Augustine/LSP	1997-98 Avg.	metered	0.88	286,200	800	1,900
R11	M. Bergman, Residential Property	301 Grace Way	1996 Report	metered	0.50	164,000	400	500
R12	Mid-Peninsula Housing (Emerald Hills)	101 Civic Center Dr.	C2G Report	estimate	6.3	2,064,100	5,700	12,700
R13	Montevalle Mobile Home Park	552 Bean Creek Rd	1996 Report	estimate	7.9	2,588,000	7,100	17,000
R14	Oak Terrace HOA	211 Bean Creek Rd	1996 Report	estimate	0.6	186,000	500	1,000
R15	Orvick Property Mgmt (K. Bates)	226 Mt. Hermon Rd./LSP	1997-98 Avg.	metered	0.40	130,700	400	1,000
R16	Redwood Vista HOA (Townhomes)	6049 Scotts Valley Drive	1995-1998 Avg.	metered	0.38	125,100	300	1,300
R17	Ridgecrest Partners	32 Ridgecrest Way	1996 Report	estimate	0.2	49,000	100	200
R18	Rolling Green HOA	0 Lockwood	1996 Report	estimate	1.0	324,000	900	3,100
R19	Ryland Homes	Silverwood/LaMadrona/LSP	1997-98 Avg.	metered	0.36	116,800	320	800
R20	Scottsboro Townhomes	Arabian Way @ Lundy Lane	1996 Report	metered	14.33	4,670,000	12,800	24,000
R21	Shadow Oaks HOA	318 Oak Creek Blvd.	1996 Report	metered	1.76	574,000	1,600	2,700
R22	Sky Park Development	Skypark/Coast Range Dr/Airstream Ct	1997-98 Avg.	metered	3.47	1,132,000	3,101	10,800
R23	Spring Lakes Mobile Home Park	225 Mt. Hermon Rd	1996 Report	estimate	7.9	2,588,000	7,100	17,000
R24	Sunflower HOA	5525 Scotts Valley Dr	1995-1998 Avg.	metered	3.04	852,000	2,700	7,800
R25	Tuscany Hills HOA	Tuscany Hills/Grace Way	1997-98 Avg.	metered	0.53	174,100	500	3,285
R26	Valley Common HOA	Silver Birch @ Lundy Lane	1996 Report	metered	0.57	187,000	500	1,200
R27	Village Meadows HOA	106 Bluebonnet Ln	1996 Report	metered	0.77	251,000	700	1,900
R28	Vineyard Residential Assoc.	105 Bordeaux Ln	1995-1998 Avg.	metered	10.03	3,267,500	9,000	21,000
R29	Vista Del Lago Mobile Home Park	444 Whispering Pines Dr	1996 Report	estimate	7.9	2,588,000	7,100	17,000
R30	Woodhill Village HOA	Civic Center Dr. @ Cathy Lane	C2G Report	estimate	6.3	2,064,100	5,700	12,700
				TOTAL	107	34,744,000	95,722	224,085

Future Phases

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TABLE 5-1
POTENTIAL RECYCLED WATER USERS
IRRIGATION DEMANDS

User ID	Customer	Address	Reference for Water Use Estimate		DEMAND ESTIMATE			
					Annual (AFY)	Annual (gal/year)	Average (gpd)	Peak Month (gpd)
F1	Acorn Court Apts	4301-1 Scotts Valley Drive	Planning Dept.	estimate	3	818,000	2,200	5,300
F2	Blue Bonnet Cottages	Blue Bonnet Lane	Planning Dept.	estimate	2	510,000	1,400	3,400
F3	Glen Canyon Apartments	Mt. Hermon Road near Hwy 17 off ramp	Planning Dept.	estimate	5	1,582,000	4,300	10,300
F4	Glenwood Neighborhood Park		Planning Dept.	estimate	1	436,000	1,200	2,900
F5	Glenwood Subdivision	Glenwood Dr above Siltanen Park	Planning Dept.	estimate	107	34,848,000	95,500	229,200
F6	Inn at Scotts Valley	LaMadrona/Mt. Hermon LSP	Planning Dept. [3]	estimate	5	1,530,000	4,200	10,100
F7	La Madrona Terrace & Plaza	La Madrona Drive at Silverwood	Planning Dept.	estimate	30	9,800,000	26,800	64,320
F8	Latos Subdivision	Mt. Hermon Road near Hwy 17	Planning Dept.	estimate	2	568,000	1,600	3,840
F9	Oak Creek Business Center	Glen Canyon & Oak Creek Blvd.	Planning Dept.	estimate	14	4,417,000	12,100	29,040
F10	Polo Ranch Subdivision	off of Santa's Village Road	Planning Dept.	estimate	57	18,411,000	50,400	120,960
F11	Rite Aid Pharmacy	King's Village	Planning Dept.	estimate	1	337,000	900	2,160
F12	Scotts Valley Auto Mall	Scotts Valley Drive, across from El Pueblo	Planning Dept.	estimate	3	1,089,000	2,984	7,161
F13	Siltanen Park Expansion		Planning Dept.	estimate	27	8,712,000	23,900	57,360
F14	Skypark Commercial		Planning Dept.	estimate	10	3,267,000	9,000	21,600
				TOTAL	265	86,330,000	240,000	570,000

TOTAL	855 AFY	273,300,000 gal/year	764,700 avg. gpd	1,422,100 peak gpd

1 Recycled Water Study Project Report, May 1996. EOA, Inc., Todd Engineers and Kennedy/Jenks Consultants.
Where available, demand was estimated from meter readings from December 1993 to December 1994.
2 Based on readings of irrigation water meters for that time period.
3 Estimates based on land use and water application rate of 20 gal./sft/year.
4 Development of Reclaimed Water Distribution System Master Plan, (Table 2-2). October 1997. Civil Consultants Group.

Future Phases

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ch5 tables.xls\table 5-1

ATTACHMENT D

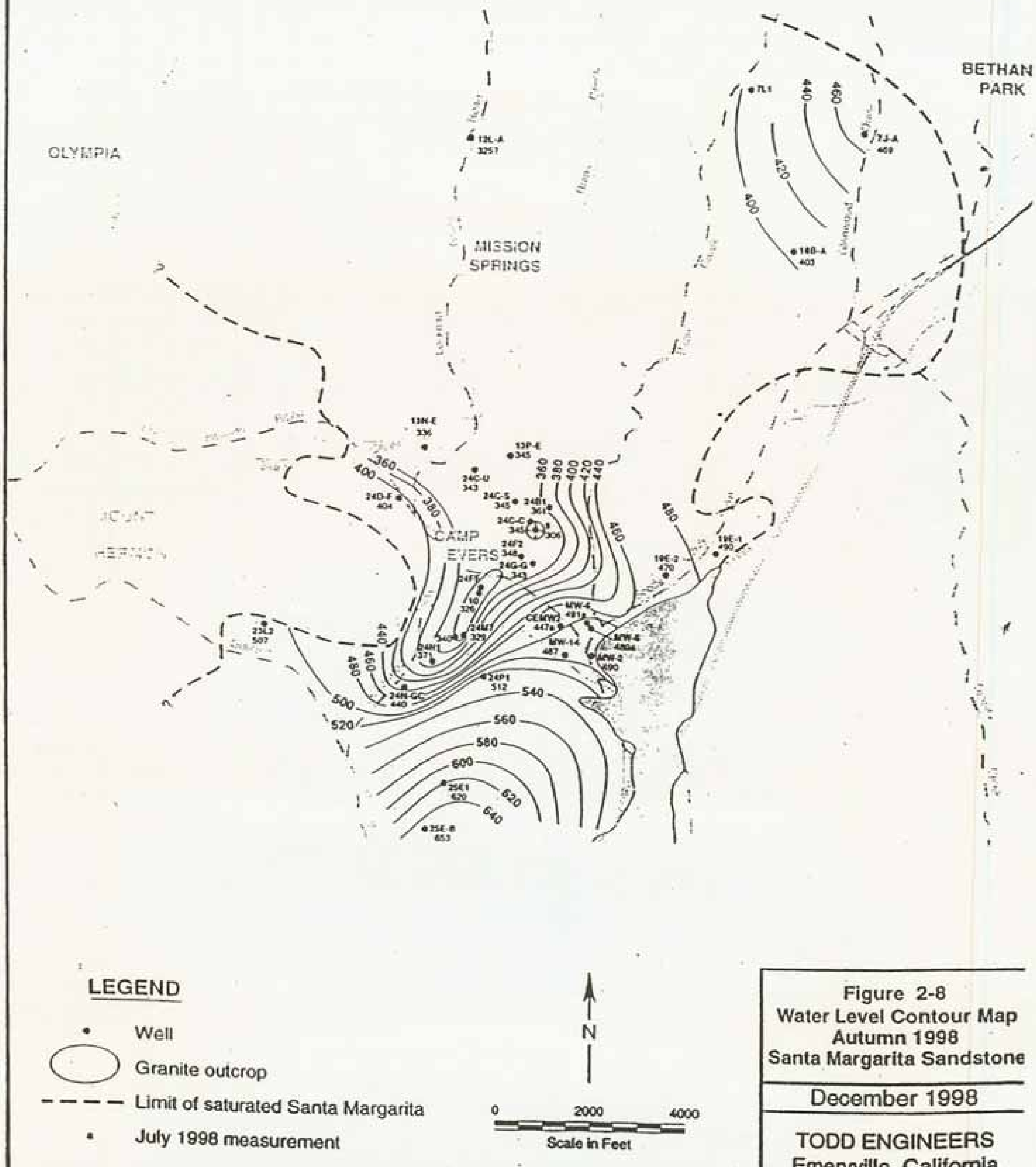

Figure 2-8
Water Level Contour Map
Autumn 1998
Santa Margarita Sandstone

December 1998

TODD ENGINEERS
Emeryville, California

Appendix C: Maximum Contaminant Levels

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MAXIMUM CONTAMINANT LEVELS AND REGULATORY DATES FOR DRINKING WATER U.S. EPA VS CALIFORNIA

LAST UPDATED JULY 2014

Contaminant	U.S. EPA		California	
	MCL (mg/L)	**Date**[a]	**MCL** (mg/L)	**Effective Date**
Inorganics				
Aluminum	0.05 to 0.2[b]	1/91	1 0.2[b]	2/25/89 9/8/94
Antimony	0.006	7/92	0.006	9/8/94
Arsenic	0.05 0.010	eff: 6/24/77 eff: 1/23/06	0.05 0.010	77 11/28/08
Asbestos	7 MFL[c]	1/91	7 MFL[c]	9/8/94
Barium	1 2	eff: 6/24/77 1/91	1	77
Beryllium	0.004	7/92	0.004	9/8/94
Cadmium	0.010 0.005	eff: 6/24/77 1/91	0.010 0.005	77 9/8/94
Chromium	0.05 0.1	eff: 6/24/77 1/91	0.05	77
Copper	1.3[d]	6/91	1[b] 1.3[d]	77 12/11/95
Cyanide	0.2	7/92	0.2 0.15	9/8/94 6/12/03
Fluoride	4 2[b]	4/86 4/86	2	4/98
Hexavalent Chromium	-	-	0.010	7/1/14
Lead	0.05[e] 0.015[d]	eff: 6/24/77 6/91	0.05 [e] 0.015[d]	77 12/11/95
Mercury	0.002	eff: 6/24/77	0.002	77
Nickel	Remanded		0.1	9/8/94
Nitrate	(as N) 10	eff: 6/24/77	(as N03) 45	77
Nitrite (as N)	1	1/91	1	9/8/94
Total Nitrate/Nitrite (as N)	10	1/91	10	9/8/94
Perchlorate	-	-	0.006	10/18/07
Selenium	0.01 0.05	eff: 6/24/77 1/91	0.01 0.05	77 9/8/94
Thallium	0.002	7/92	0.002	9/8/94
Radionuclides				
Uranium	30 ug/L	12/7/00	20 pCi/L 20 pCi/L	1/1/89 6/11/06
Combined Radium - 226+228	5 pCi/L	eff: 6/24/77	5 pCi/L 5 pCi/L	77 6/11/06
Gross Alpha particle activity (excluding radon & uranium)	15 pCi/L	eff: 6/24/77	15 pCi/L 15 pCi/L	77 6/11/06
Gross Beta particle activity	4 millirem/yr	eff: 6/24/77	50 pCi/L[f] 4 millirem/yr	77 6/11/06
Strontium-90	8 pCi/L	eff: 6/24/77 now covered by Gross Beta	8 pCi/L[f] 8 pCi/L[f]	77 6/11/06
Tritium	20,000 pCi/L	eff: 6/24/77 now covered by Gross Beta	20,000 pCi/L[f] 20,000 pCi/L[f]	77 6/11/06

Contaminant	U.S. EPA		California	
	MCL (mg/L)	**Date**[a]	**MCL** (mg/L)	**Effective Date**
VOCS				
Benzene	0.005	6/87	0.001	2/25/89
Carbon Tetrachloride	0.005	6/87	0.0005	4/4/89
1,2-Dichlorobenzene	0.6	1/91	0.6	9/8/94
1,4-Dichlorobenzene	0.075	6/87	0.005	4/4/89
1,1-Dichloroethane	-	-	0.005	6/24/90
1,2-Dichloroethane	0.005	6/87	0.0005	4/4/89
1,1-Dichloroethylene	0.007	6/87	0.006	2/25/89
cis-1,2-Dichloroethylene	0.07	1/91	0.006	9/8/94
trans-1,2-Dichloroethylene	0.1	1/91	0.01	9/8/94
Dichloromethane	0.005	7/92	0.005	9/8/94
1,3-Dichloropropene	-	-	0.0005	2/25/89
1,2-Dichloropropane	0.005	1/91	0.005	6/24/90
Ethylbenzene	0.7	1/91	0.68 0.7 0.3	2/25/89 9/8/94 6/12/03
Methyl-tert-butyl ether (MTBE)	-	-	0.005[b] 0.013	1/7/99 5/17/00
Monochlorobenzene	0.1	1/91	0.03 0.07	2/25/89 9/8/94
Styrene	0.1	1/91	0.1	9/8/94
1,1,2,2-Tetrachloroethane	-	-	0.001	2/25/89
Tetrachloroethylene	0.005	1/91	0.005	5/89
Toluene	1	1/91	0.15	9/8/94
1,2,4 Trichlorobenzene	0.07	7/92	0.07 0.005	9/8/94 6/12/03
1,1,1-Trichloroethane	0.200	6/87	0.200	2/25/89
1,1,2-Trichloroethane	0.005	7/92	0.032 0.005	4/4/89 9/8/94
Trichloroethylene	0.005	6/87	0.005	2/25/89
Trichlorofluoromethane	-	-	0.15	6/24/90
1,1,2-Trichloro-1,2,2-Trifluoroethane	-	-	1.2	6/24/90
Vinyl chloride	0.002	6/87	0.0005	4/4/89
Xylenes	10	1/91	1.750	2/25/89

Contaminant	U.S. EPA		California	
	MCL (mg/L)	**Date**[a]	**MCL** (mg/L)	**Effective Date**
SOCS				
Alachlor	0.002	1/91	0.002	9/8/94
Atrazine	0.003	1/91	0.003 0.001	4/5/89 6/12/03
Bentazon	-	-	0.018	4/4/89
Benzo(a) Pyrene	0.0002	7/92	0.0002	9/8/94
Carbofuran	0.04	1/91	0.018	6/24/90
Chlordane	0.002	1/91	0.0001	6/24/90
Dalapon	0.2	7/92	0.2	9/8/94
Dibromochloropropane	0.0002	1/91	0.0001 0.0002	7/26/89 5/3/91
Di(2-ethylhexyl)adipate	0.4	7/92	0.4	9/8/94
Di(2-ethylhexyl)phthalate	0.006	7/92	0.004	6/24/90
2,4-D	0.1 0.07	eff: 6/24/77 1/91	0.1 0.07	77 9/8/94
Dinoseb	0.007	7/92	0.007	9/8/94
Diquat	0.02	7/92	0.02	9/8/94
Endothall	0.1	7/92	0.1	9/8/94
Endrin	0.0002 0.002	eff: 6/24/77 7/92	0.0002 0.002	77 9/8/94
Ethylene Dibromide	0.00005	1/91	0.00002 0.00005	2/25/89 9/8/94
Glyphosate	0.7	7/92	0.7	6/24/90
Heptachlor	0.0004	1/91	0.00001	6/24/90
Heptachlor Epoxide	0.0002	1/91	0.00001	6/24/90
Hexachlorobenzene	0.001	7/92	0.001	9/8/94
Hexachlorocyclopentadiene	0.05	7/92	0.05	9/8/94
Lindane	0.004 0.0002	eff: 6/24/77 1/91	0.004 0.0002	77 9/8/94
Methoxychlor	0.1 0.04	eff: 6/24/77 1/91	0.1 0.04 0.03	77 9/8/94 6/12/03
Molinate	-	-	0.02	4/4/89
Oxamyl	0.2	7/92	0.2 0.05	9/8/94 6/12/03
Pentachlorophenol	0.001	1/91	0.001	9/8/94
Picloram	0.5	7/92	0.5	9/8/94
Polychlorinated Biphenyls	0.0005	1/91	0.0005	9/8/94
Simazine	0.004	7/92	0.010 0.004	4/4/89 9/8/94
Thiobencarb	-	-	0.07 0.001[b]	4/4/89 4/4/89
Toxaphene	0.005 0.003	eff: 6/24/77 1/91	0.005 0.003	77 9/8/94
2,3,7,8-TCDD (Dioxin)	$3x10^{-8}$	7/92	$3x10^{-8}$	9/8/94
2,4,5-TP (Silvex)	0.01 0.05	eff: 6/24/77 1/91	0.01 0.05	77 9/8/94

Contaminant	U.S. EPA		California	
	MCL (mg/L)	**Date**[a]	**MCL** (mg/L)	**Effective Date**
Disinfection Byproducts				
Total Trihalomethanes	0.100 0.080	11/29/79 eff: 11/29/83 eff: 1/1/02 [g]	0.100 0.080	3/14/83 6/17/06
Haloacetic acids (five)	0.060	eff: 1/1/02 [g]	0.060	6/17/06
Bromate	0.010	eff: 1/1/02 [g]	0.010	6/17/06
Chlorite	1.0	eff: 1/1/02 [g]	1.0	6/17/06
Treatment Technique				
Acrylamide	TT[h]	1/91	TT[h]	9/8/94
Epichlorohydrin	TT[h]	1/91	TT[h]	9/8/94

a. "eff." indicates the date the MCL took effect; any other date provided indicates when US EPA established (i.e., published) the MCL.
b. Secondary MCL.
c. MFL = million fibers per liter, with fiber length > 10 microns.
d. Regulatory Action Level; if system exceeds, it must take certain actions such as additional monitoring, corrosion control studies and treatment, and for lead, a public education program; replaces MCL.
e. The MCL for lead was rescinded with the adoption of the regulatory action level described in footnote d.
f. Gross beta MCL is 4 millirem/year annual dose equivalent to the total body or any internal organ; Sr-90 MCL = 4 millirem/year to bone marrow; tritium MCL = 4 millirem/year to total body
g. Effective for surface water systems serving more than 10,000 people; effective for all others 1/1/04.
h. TT = treatment technique, because an MCL is not feasible.

Table of Secondary Drinking Water Standards

Contaminant	Secondary MCL (Maximum Contaminant Level)	Noticeable Effects above the Secondary MCL (Maximum Contaminant Level) (Maximum Contaminant Level)
Aluminum	0.05 to 0.2 mg/L (Milligrams per Liter)* (Milligrams per Liter)	colored water
Chloride	250 mg/L (Milligrams per Liter)	salty taste
Color	15 color units	visible tint
Copper	1.0 mg/L (Milligrams per Liter)	metallic taste; blue-green staining
Corrosivity	Non-corrosive	metallic taste; corroded pipes/ fixtures staining
Fluoride	2.0 mg/L (Milligrams per Liter)	tooth discoloration
Foaming agents	0.5 mg/L (Milligrams per Liter)	frothy, cloudy; bitter taste; odor
Iron	0.3 mg/L (Milligrams per Liter)	rusty color; sediment; metallic taste; reddish or orange staining
Manganese	0.05 mg/L (Milligrams per Liter)	black to brown color; black staining; bitter metallic taste
Odor	3 TON (threshold odor number)	"rotten-egg", musty or chemical smell
pH	6.5 - 8.5	low pH: bitter metallic taste; corrosion high pH: slippery feel; soda taste; deposits
Silver	0.1 mg/L (Milligrams per Liter)	skin discoloration; graying of the white part of the eye
Sulfate	250 mg/L (Milligrams per Liter)	salty taste
Total Dissolved Solids (TDS (Total Dissolved Solids))	500 mg/L (Milligrams per Liter)	hardness; deposits; colored water; staining; salty taste
Zinc	5 mg/L (Milligrams per Liter)	metallic taste

*mg/L (Milligrams per Liter) is milligrams of substance per liter of water.

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Appendix D: APF Hydraulic Calculations

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APF Hydraulic Calculations

Process Point	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Process Name	**APF Feed**	**MF Unit Feed**	**Spent WW**	**MF Filtrate/ RO Feed**	**RO Unit Feed**	**RO Concentrate**	**RO Permeate/ AOP Unit Feed**	**Purified Product Water**	**Injection Well Unit Flow**
Max. Design Flowrate, gpm	700	700	35	665	222	113	552	552	184
Avg. Design Flowrate, gpm	420	420	21	399	200	68	331	331	110
Min. Design Flowrate, gpm	230	230	11.5	219	219	37	181	181	91
Typical TDS, mg/L	800	800	800	800	800	4706	30	60	60
Typical TOC, mg/L	15	15	15	11.3	11.3	66	0.5	0.5	0.5

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Appendix E: Detailed Cost Estimates

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SVWD Recycled Water Supply Alternatives

KENNEDY/JENKS CONSULTANTS

Project:	SMGB Groundwater Replenishment Program Facilities Planning Report	**Prepared By:**	JEG
Alternative:	Project Alternative #1. APF at SV WRF	**Date Prepared:**	Sep-2015
Area:	Scotts Valley, CA	**K/J Proj. No.**	1568002*01
Estimate:	Conceptual-Level	**Jul 15 ENR**	11155.07

Item No.	Description	Qty	Units	Total Costs: Unit Cost	Total Capital Cost (2015)	Annualized Cost
	Facility Capital Costs					
1.0	**Treatment Facility**					
1.1	Microfiltration/Reverse Osmosis/Advanced Oxidation	1.0	mgd	--	$1,980,000	
1.2	MF Building	4,000	sf	325	$1,300,000	
1.3	RO/UV Building	4,800	sf	325	$1,560,000	
	Subtotal Costs				$4,840,000	
	Taxes, Overhead, Markups, Contingency, etc				$2,221,560	
	Escalation to Midpoint of Construction				$564,925	
	Total Capital Costs				$7,630,000	
2.0	**Wells**					
2.1	Injection wells (3 @ 200 gpm each)	3		310,000	$930,000	
2.2	Monitoring wells	2		100,000	$200,000	
	Subtotal Costs				$1,130,000	
	Taxes, Overhead, Markups, Contingency, etc				$518,670	
	Escalation to Midpoint of Construction				$131,894	
	Total Capital Costs				$1,780,000	
3.0	**Pipelines**					
3.1	Purified Water Pipeline from SV WRF to HQ	6,875	lf	120	$830,000	
3.2	Purified Water Pipeline to Wells	1,600	lf	120	$190,000	
	Subtotal Costs				$1,020,000	
	Taxes, Overhead, Markups, Contingency, etc				$468,180	
	Escalation to Midpoint of Construction				$119,054	
	Total Capital Costs				$1,610,000	
4.0	**Pump Stations**					
4.1	Purified Water Pumps				$200,000	
	Subtotal Costs				$200,000	
	Taxes, Overhead, Markups, Contingency, etc				$91,800	
	Escalation to Midpoint of Construction				$23,344	
	Total Capital Costs				$320,000	
5.0	**Storage**					
5.1	New RW EQ/Storage, welded steel tank	225,000	gallons	1.5	$337,500	
5.2	RW EQ/RO break tank, below grade cement	50,000	gallons	2	$100,000	
5.3	Purified Tank at SV WRF, below grade cement	50,000	gallons	2	$100,000	
5.4	Purified Tank at HQ, welded steel tank	50,000	gallons	2	$100,000	
	Subtotal Costs				$637,500	
	Taxes, Overhead, Markups, Contingency, etc				$292,613	
	Escalation to Midpoint of Construction				$74,409	
	Total Capital Costs				$1,000,000	
	Subtotal Facility Costs				**$7,830,000**	

Additional Facility Capital Costs						
6.0	Site Development Costs	@	5%		$340,500	
7.0	Yard Piping	@	5%		$340,500	
8.0	Electrical, I&C, and Remote (low-tech) Control	@	20%		$1,234,500	
	Subtotal Additional Facility Costs				$1,920,000	
	Overhead, Contingency, etc				$806,400	
	Escalation to Midpoint of Construction				$218,112	
	Total Capital Costs				$2,940,000	
	Facility Direct Costs Subtotal				**$9,750,000**	
	Taxes	@	9.75%		$305,370	
	Mobilization/Bonds/Permits	@	5%		$487,500.00	
	Contractor Overhead & Profit	@	12%		$1,170,000	
	Estimate Contingency	@	25%		$2,437,500	
Subtotal with Contractor Markups and Contingency					**$14,150,000**	
	Escalation to Midpoint of Construction	@	8.0%		$1,130,000	
	Itemized Project Construction Cost Total				$15,280,000	
	Subtotal Engr/CM/Legal/Admin Costs				**$2,700,000**	
	CEQA/Permitting/Outreach				**$1,500,000**	
	Project Capital Cost Total				**$19,480,000**	

Annualized Capital Cost	**$680,000**
Annualized ($/MG)	$3,700
Annualized ($/1000 gal)	$4
Annualized Capital ($/AFY)	$1,210

Annual Operations and Maintenance	**Qty**	**Units**	**Total Annual Costs** **$/Unit**	**Total**	
Energy Costs					
Energy (Treatment)	270,000	KWh	0.16	$43,200	
Energy (conveyance to Injection field)	80,000	KWh	0.16	$12,800	
Energy (GW Injection)	60,000	KWh	0.16	$9,600	
Energy (other)	10,000	KWh	0.16	$1,600	
Subtotal Energy Costs				$67,200	
Labor Costs					
Labor at Treatment facility	3	staff	75,000	$225,000	
Other Labor (pipe, pump, discharge, monitoring)	0.5	staff	50,000	$25,000	
Subtotal Labor Costs				$250,000	
Chemicals	1.0	mgd	70,000	$70,000	
Subtotal Chemical Costs				$70,000	
Maintenance and Materials					
Membrane Replacement Accrual	1.0	mgd	22,000	$22,000	
Other Materials and Supplies	@	2.0%		$38,000	
Subtotal Maintenance Costs				$60,000	
Contingency	@	5.0%		$44,720	
		Annual O&M Costs		**$491,920**	**$491,920**
				Total O&M Costs	$14,760,000
				Annual O&M ($/MG)	$2,700
				Annual O&M ($/1000 gal)	$3
				Annual O&M ($/AFY)	$880

CEQA/Permitting/Outreach	@	10%		1,500,000	
Engineering/Construction Management	@	16%		2,300,000	
Legal	@	1%		100,000	
Administrative	@	2%		300,000	
Subtotal Engr/CM/Legal/Admin Costs				$2,700,000	

SVWD Recycled Water Supply Alternatives

Project:	SMGB Groundwater Replenishment Program Facilities Planning Report	**KENNEDY/JENKS CONSULTANTS** Prepared By:	JEG
Alternative:	Project Alternative #2a. APF HQ SV WRF--RW pipeline extension + Outfall tie-in at Graham Hill Rd	**Date Prepared:**	Sep-2015
Area:	Scotts Valley, CA	**K/J Proj. No.**	1568002*01
Estimate:	Conceptual-Level	**Jul 15 ENR**	11155.07

Item No.	Description	Qty	Units	Total Costs Unit Cost	Total Capital Cost (2015)	Annualized Capital Cost
	Facility Capital Costs					
1.0	**Treatment Facility**					
1.1	Microfiltration/Reverse Osmosis/Advanced Oxidation	1.0	mgd	--	$1,980,000	
1.2	Building	9,800	sf	250	$2,450,000	
	Subtotal Costs				$4,430,000	
	Taxes, Overhead, Markups, Contingency, etc				$2,033,370	
	Escalation to Midpoint of Construction				$517,069.60	
	Total Capital Costs				$6,980,000	
2.0	**Wells**					
2.1	Injection wells (3 @ 200 gpm each)	3		310,000	$930,000	
2.2	Monitoring wells	2		100,000	$200,000	
	Subtotal Costs				$1,130,000	
	Taxes, Overhead, Markups, Contingency, etc				$518,670	
	Escalation to Midpoint of Construction				$131,893.60	
	Total Capital Costs				$1,780,000	
3.0	**Pipelines**					
3.1	RW line extenstion from Valve Station to HQ	2,600	lf	150	$390,000	
3.2	Concentrate Line from APF at HQ to outfall at Graham Hill Rd	5,285	lf	90	$475,650	
3.3	Purified Water Pipeline to Wells	1,600	lf	120	$190,000	
	Subtotal Costs				$1,055,650	
	Taxes, Overhead, Markups, Contingency, etc				$484,543	
	Escalation to Midpoint of Construction				$123,215.47	
	Total Capital Costs				$1,660,000	
6.0	**Pump Stations**					
6.2	RW waterpump station				$210,000	
6.2	Concentrate disposal pumps				$140,000	
	Subtotal Costs				$350,000	
	Taxes, Overhead, Markups, Contingency, etc				$160,650	
	Escalation to Midpoint of Construction				$40,852.00	
	Total Capital Costs				$550,000	
7.0	**Storage**					
7.1	New RW EQ/Storage, welded steel tank	250,000	gallons	1.5	$375,000	
7.2	EQ at HQ, Welded Steel	50,000	gallons	2	$100,000	
7.3	RO feed/ break tank, plastic	10,000	gallons		$7,000	
7.4	Purified Tank, welded steel tank	50,000	gallons	2	$100,000	
	Subtotal Costs				$582,000	
	Taxes, Overhead, Markups, Contingency, etc				$267,138	
	Escalation to Midpoint of Construction				$67,931.04	
	Total Capital Costs				$920,000	
	Subtotal Facility Costs				**$7,550,000**	

Additional Facility Capital Costs						
8.0	Site Development Costs	@	8%		$519,548	
8.1	Property Aqusition				$350,000	
9.0	Yard Piping	@	5%		$324,718	
10.0	Electrical, I&C, and Remote (low-tech) Control	@	20%		$1,182,470	
	Subtotal Additional Facility Costs				$2,380,000	
	Overhead, Contingency, etc				$999,600	
	Escalation to Midpoint of Construction				$270,368.00	
	Total Capital Costs				$3,650,000	
	Facility Direct Costs Subtotal				**$9,930,000**	
	Taxes	@	9.75%		$294,450	
	Mobilization/Bonds/Permits	@	5%		$500,000.00	
	Contractor Overhead & Profit	@	12%		$1,191,600.00	
	Estimate Contingency	@	25%		$2,480,000	
Subtotal with Contractor Markups and Contingency					**$14,400,000**	
	Escalation to Midpoint of Construction	@	8%		$1,150,000	
	Itemized Project Construction Cost Total				$15,540,000	
	Subtotal Engr/CM/Legal/Admin Costs				**$2,700,000**	
	CEQA/Permitting/Outreach				**$1,500,000**	
	Total Project Cost				**$19,740,000**	

Annualized Capital Cost	**$690,000**
Annualized ($/MG)	$3,800
Annualized ($/1000 gal)	$4
Annualized Capital ($/AFY)	$1,230

Annual Operations and Maintenance	**Qty**	**Units**	**Total Annual Costs** **$/Unit**	**Total**	
Energy Costs					
Energy (Treatment)	270,000	KWh	0.16	43,200	
Energy (conveyance to injection field)	80,000	KWh	0.16	12,800	
Energy (GW Injection)	60,000	KWh	0.16	9,600	
Energy (other)	10,000	KWh	0.16	1,600	
Labor Costs					
Labor at Treatment facility	3	staff	75,000	225,000	
Other Labor (pipe, pump, discharge, monitoring)	0.5	staff	50,000	25,000	
Chemicals	1.0	mgd	70,000	70,000	
Treatment Supplies					
Membrane Replacement Accrual	1.0	mgd	22,000	22,000	
Other Materials and Supplies	@	3.5%		83,000	
Solids Disposal		LS		0	
Maintenance: Other		LS		0	
Contingency	@	5.0%		24,610	
Annual O&M Costs				**$516,810**	**$516,810**
				Total O&M Costs	$15,500,000
				Annual O&M ($/MG)	$2,800
				Annual O&M ($/1000 gal)	$3
				Annual O&M ($/AFY)	$920

CEQA/Permitting/Outreach	@	10%		1,500,000	
Engineering/Construction Management	@	16%		2,300,000	
Legal	@	1%		100,000	
Administrative	@	2%		300,000	
Subtotal Engr/CM/Legal/Admin Costs				$2,700,000	

SVWD Recycled Water Supply Alternatives

KENNEDY/JENKS CONSULTANTS

Project:	SMGB Groundwater Replenishment Program Facilities Planning Report	**Prepared By:**	JEG
Alternative:	Project Alternative #2b. APF HQ SV WRF--RW pipeline replacement + Outfall tie-in at Graham Hill Rd	**Date Prepared:**	Sep-2015
Area:	Scotts Valley, CA	**K/J Proj. No.**	1568002*01
Estimate:	Conceptual-Level	**Jul 15 ENR**	11155.07

Item No.	Description	Qty	Units	Total Costs Unit Cost	Total Capital Cost (2015)	Annualized Capital Cost
	Facility Capital Costs					
1.0	**Treatment Facility**					
1.1	Microfiltration/Reverse Osmosis/Advanced Oxidation	1.0	mgd	--	$1,980,000	
1.2	Building	9,800	sf	250	$2,450,000	
	Subtotal Costs				$4,430,000	
	Taxes, Overhead, Markups, Contingency, etc				$2,033,370	
	Escalation to Midpoint of Construction				$517,069.60	
	Total Capital Costs				$6,980,000	
2.0	**Wells**					
2.1	Injection wells (3 @ 200 gpm each)	3		310,000	$930,000	
2.2	Monitoring wells	2		100,000	$200,000	
	Subtotal Costs				$1,130,000	
	Taxes, Overhead, Markups, Contingency, etc				$518,670	
	Escalation to Midpoint of Construction				$131,893.60	
	Total Capital Costs				$1,780,000	
3.0	**Pipelines**					
3.1	New RW pipeline from SV WRF to HQ	6,875	lf	150	$1,030,000	
3.2	Brine Line from APF at HQ to outfall at Graham Hill Rd	5,285	lf	90	$475,650	
3.3	Purified Water Pipeline to Wells	1,600	lf	120	$190,000	
	Subtotal Costs				$1,695,650	
	Taxes, Overhead, Markups, Contingency, etc				$778,303	
	Escalation to Midpoint of Construction				$197,916.27	
	Total Capital Costs				$2,670,000	
4.0	**Pump Stations**					
4.1	RW waterpump station				$280,000	
4.2	Brine disposal pumps				$140,000	
	Subtotal Costs				$420,000	
	Taxes, Overhead, Markups, Contingency, etc				$192,780	
	Escalation to Midpoint of Construction				$49,022.40	
	Total Capital Costs				$660,000	
5.0	**Storage**					
5.1	New RW EQ/Storage, welded steel tank	250,000	gallons	1.5	$375,000	
5.2	EQ at HQ, Welded Steel	50,000	gallons	2	$100,000	
5.3	RO feed/ break tank, plastic	10,000	gallons		$7,000	
5.4	Purified Tank, welded steel tank	50,000	gallons	2	$100,000	
	Subtotal Costs				$582,000	
	Taxes, Overhead, Markups, Contingency, etc				$267,138	
	Escalation to Midpoint of Construction				$67,931.04	
	Total Capital Costs				$920,000	
	Subtotal Facility Costs				**$8,260,000**	

Additional Facility Capital Costs						
8.0	Site Development Costs	@	8%		$525,148	
8.1	Property Aqusition				$350,000	
7.0	Yard Piping	@	5%		$328,218	
8.0	Electrical, I&C, and Remote (low-tech) Control	@	20%		$1,196,470	
	Subtotal Additional Facility Costs				$2,400,000	
	Overhead, Contingency, etc				$1,008,000	
	Escalation to Midpoint of Construction				$272,640.00	
	Total Capital Costs				$3,680,000	
	Facility Direct Costs Subtotal				**$8,260,000**	
	Taxes	@	9.75%		$322,140	
	Mobilization/Bonds/Permits	@	5%		$413,000.00	
	Contractor Overhead & Profit	@	12%		$991,200.00	
	Estimate Contingency	@	25%		$2,065,000	
Subtotal with Contractor Markups and Contingency					**$12,050,000**	
	Escalation to Midpoint of Construction	@	8%		$960,000	
	Itemized Project Construction Cost Total				$16,690,000	
	Subtotal Engr/CM/Legal/Admin Costs				**$2,200,000**	
	CEQA/Permitting/Outreach				**1,500,000**	
	Project Capital Cost Total				**$20,390,000**	
					Annualized Capital Cost	**$580,000**
					Annualized ($/MG)	$3,200
					Annualized ($/1000 gal)	$3
					Annualized Capital ($/AFY)	$1,040

Annual Operations and Maintenance	Qty	Units	Total Annual Costs $/Unit	Total	
Energy Costs					
Energy (Treatment)	270,000	KWh	0.16	43,200	
Energy (conveyance to beneficial use)	180,000	KWh	0.16	28,800	
Energy (GW Injection)	60,000	KWh	0.16	9,600	
Energy (other)	10,000	KWh	0.16	1,600	
Labor Costs					
Labor at Treatment facility	3	staff	75,000	225,000	
Other Labor (pipe, pump, discharge, monitoring)	0.5	staff	50,000	25,000	
Chemicals	1.0	mgd	70,000	70,000	
Treatment Supplies					
Membrane Replacement Accrual	1.0	mgd	22,000	22,000	
Other Materials and Supplies	@	3.5%		84,000	
Contingency	@	5.0%		25,460	
		Annual O&M Costs		**$534,660**	**$534,660**
				Total O&M Costs	$16,040,000
				Annual O&M ($/MG)	$2,900
				Annual O&M ($/1000 gal)	$3
				Annual O&M ($/AFY)	$950
CEQA/Permitting/Outreach	@	10%		1,500,000	
Engineering/Construction Management	@	16%		1,900,000	
Legal	@	1%		100,000	
Administrative	@	2%		200,000	
Subtotal Engr/CM/Legal/Admin Costs				$2,200,000	

SVWD Recycled Water Supply Alternatives

KENNEDY/JENKS CONSULTANTS

Project:	SMGB Groundwater Replenishment Program Facilities Planning Report	**Prepared By:**	JEG
Alternative:	Project Alternative #2c. APF HQ SV WRF--RW pipeline extension + Outfall tie-in at Estrella Dr.	**Date Prepared:**	Sep-2015
Area:	Scotts Valley, CA	**K/J Proj. No.**	1568002*01
Estimate:	Conceptual-Level	**Jul 15 ENR**	11155.07

Item No.	Description	Qty	Units	Total Costs Unit Cost	Total Capital Cost (2015)	Annualized Capital Cost
	Facility Capital Costs					
1.0	**Treatment Facility**					
1.1	Microfiltration/Reverse Osmosis/Advanced Oxidation	1.0	mgd	--	$1,980,000	
1.2	Building	9,800	sf	250	$2,450,000	
	Subtotal Costs				$4,430,000	
	Taxes, Overhead, Markups, Contingency, etc				$2,033,370	
	Escalation to Midpoint of Construction				$517,069.60	
	Total Capital Costs				$6,980,000	
2.0	**Wells**					
2.1	Injection wells (3 @ 200 gpm each)	3		310,000	$930,000	
2.2	Monitoring wells	2		100,000	$200,000	
	Subtotal Costs				$1,130,000	
	Taxes, Overhead, Markups, Contingency, etc				$518,670	
	Escalation to Midpoint of Construction				$131,893.60	
	Total Capital Costs				$1,780,000	
3.0	**Pipelines**					
3.1	RW line extenstion from Valve Station to HQ	2,600	lf	150	$390,000	
3.2	Brine Line from APF at HQ to outfall at Estrella Dr.	3,540	lf	90	$318,600	
3.3	Purified Water Pipeline to Wells	1,600	lf	120	$190,000	
	Subtotal Costs				$900,000	
	Taxes, Overhead, Markups, Contingency, etc				$413,100	
	Escalation to Midpoint of Construction				$105,048.00	
	Total Capital Costs				$1,420,000	
4.0	**Pump Stations**					
4.1	RW waterpump station				$210,000	
4.2	Brine disposal pumps				$130,000	
	Subtotal Costs				$340,000	
	Taxes, Overhead, Markups, Contingency, etc				$156,060	
	Escalation to Midpoint of Construction				$39,684.80	
	Total Capital Costs				$540,000	
5.0	**Storage**					
5.1	New RW EQ/Storage, welded steel tank	250,000	gallons	1.5	$375,000	
5.2	EQ at HQ, Welded Steel	50,000	gallons	2	$100,000	
5.3	RO feed/ break tank, plastic	10,000	gallons		$7,000	
5.4	Purified Tank, welded steel tank	50,000	gallons	2	$100,000	
	Subtotal Costs				$582,000	
	Taxes, Overhead, Markups, Contingency, etc				$267,138	
	Escalation to Midpoint of Construction				$67,931.04	
	Total Capital Costs				$920,000	
	Subtotal Facility Costs				**$7,380,000**	
Additional Facility Capital Costs						
8.0	Site Development Costs	@	8%		$518,512	
8.1	Property Aqusition				$350,000	
9.0	Yard Piping	@	5%		$324,070	
10.0	Electrical, I&C, and Remote (low-tech) Control	@	20%		$1,296,280	
	Subtotal Additional Facility Costs				**$2,490,000**	
	Overhead, Contingency, etc				$1,045,800.00	
	Escalation to Midpoint of Construction				$282,864.00	
	Total Capital Costs				$3,820,000	
	Facility Direct Costs Subtotal				**$9,870,000**	
	Taxes	@	9.75%		$287,820	
	Mobilization/Bonds/Permits	@	5%		$493,500.00	
	Contractor Overhead & Profit	@	12%		$1,184,400.00	
	Estimate Contingency	@	25%		$2,467,500	
Subtotal with Contractor Markups and Contingency					**$14,300,000**	
	Escalation to Midpoint of Construction	@	8%		$1,140,000	
	Itemized Project Construction Cost Total				$15,460,000	
	Subtotal Engr/CM/Legal/Admin Costs				**$2,700,000**	
	CEQA/Permitting/Outreach				**$1,500,000**	
	Project Capital Cost Total				**$19,660,000**	

Annualized Capital Cost	**$690,000**
Annualized ($/MG)	$3,800
Annualized ($/1000 gal)	$4
Annualized Capital ($/AFY)	$1,230

Annual Operations and Maintenance	**Qty**	**Units**	**Total Annual Costs** $/Unit	**Total**	
Energy Costs					
Energy (Treatment)	270,000	KWh	0.16	$43,200	
Energy (conveyance to beneficial use)	70,000	KWh	0.16	$11,200	
Energy (GW Injection)	60,000	KWh	0.16	$9,600	
Energy (other)	10,000	KWh	0.16	$1,600	
Labor Costs					
Labor at Treatment facility	3	staff	75,000	$225,000	
Other Labor (pipe, pump, discharge, monitoring)	0.5	staff	50,000	$25,000	
Chemicals	1.0	mgd	70,000	$70,000	
Treatment Supplies					
Membrane Replacement Accrual	1.0	mgd	22,000	$22,000	
Other Materials and Supplies	@	3.5%		$87,000	
Solids Disposal		LS		$0	
Maintenance: Other		LS		$0	
Contingency	@	10.0%		$49,460	
		Annual O&M Costs		**$544,060**	**$544,060**
				Total O&M Costs	$16,320,000
				Annual O&M ($/MG)	$3,000
				Annual O&M ($/1000 gal)	$3
				Annual O&M ($/AFY)	$970

CEQA/Permitting/Outreach	@	10%		1,500,000
Engineering/Construction Management	@	16%		$2,300,000
Legal	@	1%		$100,000
Administrative	@	2%		$300,000
Subtotal Engr/CM/Legal/Admin Costs				$2,700,000

SVWD Recycled Water Supply Alternatives

KENNEDY/JENKS CONSULTANTS

Project:	SMGB Groundwater Replenishment Program Facilities Planning Report	**Prepared By:**	JEG
Alternative:	Project Alternative #2d. APF HQ SV WRF--RW pipeline replacement + Outfall tie-in at Estrella Dr.	**Date Prepared:**	Sep-2015
Area:	Scotts Valley, CA	**K/J Proj. No.**	1568002*01
Estimate:	Conceptual-Level	**Jul 15 ENR**	11155.07

Item No.	Description	Qty	Units	Unit Cost	Total Costs Total Capital Cost (2015)	Annualized Capital Cost
	Facility Capital Costs					
1.0	**Treatment Facility**					
1.1	Microfiltration/Reverse Osmosis/Advanced Oxidation	1.0	mgd	--	$1,980,000	
1.2	Building	9,800	sf	250	$2,450,000	
	Subtotal Costs				$4,430,000	
	Taxes, Overhead, Markups, Contingency, etc				$2,033,370	
	Escalation to Midpoint of Construction				$517,069.60	
	Total Capital Costs				**$6,980,000**	
2.0	**Wells**					
2.1	Injection wells (3 @ 200 gpm each)	3		310,000	$930,000	
2.2	Monitoring wells	2		100,000	$200,000	
	Subtotal Costs				$1,130,000	
	Taxes, Overhead, Markups, Contingency, etc				$518,670	
	Escalation to Midpoint of Construction				$131,893.60	
	Total Capital Costs				**$1,780,000**	
3.0	**Pipelines**					
3.1	New RW pipeline from SV WRF to HQ	6,875	lf	150	$1,030,000	
3.2	Brine Line from APF at HQ to outfall at Estrella Dr.	3,540	lf	90	$318,600	
3.3	Purified Water Pipeline to Wells	1,600	lf	120	$190,000	
	Subtotal Costs				$1,538,600	
	Taxes, Overhead, Markups, Contingency, etc				$706,217	
	Escalation to Midpoint of Construction				$179,585.39	
	Total Capital Costs				**$2,420,000**	
4.0	**Pump Stations**					
4.1	RW waterpump station				$280,000	
4.2	Brine disposal pumps				$130,000	
	Subtotal Costs				$410,000	
	Taxes, Overhead, Markups, Contingency, etc				$188,190	
	Escalation to Midpoint of Construction				$47,855.20	
	Total Capital Costs				**$650,000**	
5.0	**Storage**					
5.1	New RW EQ/Storage, welded steel tank	250,000	gallons	1.5	$375,000	
5.2	EQ at HQ, Welded Steel	50,000	gallons	2	$100,000	
5.3	RO feed/ break tank, plastic	10,000	gallons		$7,000	
5.4	Purified Tank, welded steel tank	50,000	gallons	2	$100,000	
	Subtotal Costs				$582,000	
	Taxes, Overhead, Markups, Contingency, etc				$267,138	
	Escalation to Midpoint of Construction				$67,931.04	
	Total Capital Costs				**$920,000**	
	Subtotal Facility Costs				**$8,090,000**	w/o contingency etc

Additional Facility Capital Costs						
8.0	Site Development Costs	@	8%		$524,112	
8.1	Property Aqusition				$350,000	
7.0	Yard Piping	@	5%		$327,570	
8.0	Electrical, I&C, and Remote (low-tech) Control	@	20%		$1,193,880	
	Subtotal Additional Facility Costs				**$2,400,000**	
	Overhead, Contingency, etc				$1,008,000.00	
	Escalation to Midpoint of Construction				$272,640.00	
	Total Capital Costs				**$3,680,000**	
	Facility Direct Costs Subtotal				**$10,490,000**	
	Taxes	@	9.75%		$315,510	
	Mobilization/Bonds/Permits	@	5%		$524,500.00	
	Contractor Overhead & Profit	@	12%		$1,258,800.00	
	Estimate Contingency	@	25%		$2,622,500	
Subtotal with Contractor Markups and Contingency					**$15,210,000**	

Escalation to Midpoint of Construction	@	8%	$1,220,000	
Itemized Project Construction Cost Total			$16,430,000	
Subtotal Engr/CM/Legal/Admin Costs			**$2,900,000**	
CEQA/Permitting/Outreach			**$1,500,000**	
Project Capital Cost Total			**$20,830,000**	
			Annualized Capital Cost	**$730,000**
			Annualized ($/MG)	$4,000
			Annualized ($/1000 gal)	$4
			Annualized Capital ($/AFY)	$1,300

Annual Operations and Maintenance	**Qty**	**Units**	**Total Annual Costs $/Unit**	**Total**	
Energy Costs					
Energy (Treatment)	270,000	KWh	0.16	43,200	
Energy (conveyance to beneficial use)	170,000	KWh	0.16	27,200	
Energy (GW Injection)	60,000	KWh	0.16	9,600	
Energy (other)	10,000	KWh	0.16	1,600	
Labor Costs					
Labor at Treatment facility	3	staff	75,000	225,000	
Other Labor (pipe, pump, discharge, monitoring)	0.5	staff	50,000	25,000	
Chemicals	1.0	mgd	70,000	70,000	
Treatment Supplies					
Membrane Replacement Accrual	1.0	mgd	22,000	22,000	
Other Materials and Supplies	@	3.5%		84,000	
Solids Disposal		LS		0	
Maintenance: Other		LS		0	
Contingency	@	5.0%		25,380	
Annual O&M Costs				**$532,980**	**$532,980**
				Total O&M Costs	$15,990,000
				Annual O&M ($/MG)	$2,900
				Annual O&M ($/1000 gal)	$3
				Annual O&M ($/AFY)	$950

CEQA/Permitting/Outreach	@	10%		1,500,000
Engineering/Construction Management	@	16%		$2,400,000
Legal	@	1%		$200,000
Administrative	@	2%		$300,000
Subtotal Engr/CM/Legal/Admin Costs				$2,900,000

SVWD Recycled Water Supply Alternatives

KENNEDY/JENKS CONSULTANTS

Project:	SMGB Groundwater Replenishment Program Facilities Planning Report	**Prepared By:**	MJG
Alternative:	Project Alternative #3. APF El Pueblo Rd. SV WRF--RW pipeline replacement + Outfall tie-in at Estrella D	**Date Prepared:**	Apr-2016
Area:	Scotts Valley, CA	**K/J Proj. No.**	1568002*01
Estimate:	Conceptual-Level	**Jul 15 ENR**	11155.07

Item No.	Description	Qty	Units	Unit Cost	Total Costs Total Capital Cost (2015)	Annualized Capital Cost
	Facility Capital Costs					
1.0	**Treatment Facility**					
1.1	Microfiltration/Reverse Osmosis/Advanced Oxidation	1.0	mgd	--	$1,980,000	
1.2	Building	9,800	sf	250	$2,450,000	
	Subtotal Costs				$4,430,000	
	Taxes, Overhead, Markups, Contingency, etc				$2,033,370	
	Escalation to Midpoint of Construction				$517,069.60	
	Total Capital Costs				$6,980,000	
2.0	**Wells**					
2.1	Injection wells (1 @ 200 gpm each)	1		310,000	$310,000	
2.2	Redevelopment of injection wells	2		50,000	$100,000	
2.3	Monitoring wells	1		100,000	$100,000	
	Subtotal Costs				$510,000	
	Taxes, Overhead, Markups, Contingency, etc				$234,090	
	Escalation to Midpoint of Construction				$59,527.20	
	Total Capital Costs				$800,000	
3.0	**Pipelines**					
3.1	New RW pipeline from Scotts Valley Dr. tertiary main (reclaimed water line) to El Pueblo Rd. APF	1,500	lf	150	$230,000	
3.2	Brine Line from APF to sewer lateral on El Pueblo Rd.	300	lf	90	$27,000	
3.3	Purified Water Pipeline to Wells #11A and #11B (replace existing 8" PVC and AC raw water lines)	4,500	lf	120	$540,000	
	Subtotal Costs				$797,000	
	Taxes, Overhead, Markups, Contingency, etc				$365,823	
	Escalation to Midpoint of Construction				$93,025.84	
	Total Capital Costs				$1,260,000	
4.0	**Pump Stations**					
4.1	RW waterpump station				$220,000	
4.2	Brine disposal pumps				$110,000	
	Subtotal Costs				$330,000	
	Taxes, Overhead, Markups, Contingency, etc				$151,470	
	Escalation to Midpoint of Construction				$38,517.60	
	Total Capital Costs				$520,000	
5.0	**Storage**					
5.1	New RW EQ/Storage, welded steel tank	250,000	gallons	0.25	$62,500	
5.2	EQ at El Pueblo, Welded Steel	50,000	gallons	2	$100,000	
5.3	RO feed/ break tank, plastic	10,000	gallons		$7,000	
5.4	Purified Tank, welded steel tank	50,000	gallons	2	$100,000	
	Subtotal Costs				$269,500	
	Taxes, Overhead, Markups, Contingency, etc				$123,701	
	Escalation to Midpoint of Construction				$31,456.04	
	Total Capital Costs				$420,000	
6.0	**Additional Alternative Costs**					
6.1	Additional Brine Line from APF to sewer main on Scotts Valley Dr.	1,200	lf	90	$108,000	
6.2	Injection wells (2 additional @ 200 gpm each)	2		310,000	$620,000	
6.3	Brine Line from APF to WRF (not likely)	8,900	lf	120	$1,068,000	
	Subtotal Costs (not including Item No. 6.4)				$728,000	
	Taxes, Overhead, Markups, Contingency, etc				$334,152	
	Escalation to Midpoint of Construction				$84,972.16	
	Total Capital Costs				$1,150,000	
	Subtotal Facility Costs				**$6,340,000**	
	Subtotal Facility Costs (including Alternative Costs)				**$7,060,000**	

Additional Facility Capital Costs						
					Subtotal Facility Costs	
7.0	Yard Piping	@	5%		$277,150	
8.0	Electrical, I&C, and Remote (low-tech) Control	@	20%		$1,054,700	
	Subtotal Additional Facility Costs				**$1,330,000**	
	Overhead, Contingency, etc				$558,600.00	
	Escalation to Midpoint of Construction				$151,088.00	
	Total Capital Costs				$2,040,000	
	Facility Direct Costs Subtotal				**$7,670,000**	
	Taxes	@	9.75%		$247,260	
	Mobilization/Bonds/Permits	@	5%		$383,500.00	
	Contractor Overhead & Profit	@	12%		$920,400.00	
	Estimate Contingency	@	25%		$1,917,500	
Subtotal with Contractor Markups and Contingency					**$11,140,000**	
	Escalation to Midpoint of Construction	@	8%		$890,000	
	Itemized Project Construction Cost Total				$12,020,000	
	Subtotal Engr/CM/Legal/Admin Costs				**$2,100,000**	
	CEQA/Permitting/Outreach				**$1,300,000**	
	Project Capital Cost Total				**$15,420,000**	
			Annualized Capital Cost		**$540,000**	
			Annualized ($/MG)		$3,000	
			Annualized ($/1000 gal)		$3	
			Annualized Capital ($/AFY)		$960	

Annual Operations and Maintenance	Qty	Units	Total Annual Costs $/Unit	Total	
Energy Costs					
Energy (Treatment)	270,000	KWh	0.16	43,200	
Energy (conveyance to beneficial use)	100,000	KWh	0.16	16,000	
Energy (GW Injection)	100,000	KWh	0.16	16,000	
Energy (other)	10,000	KWh	0.16	1,600	
Labor Costs					
Labor at Treatment facility	3	staff	75,000	225,000	
Other Labor (pipe, pump, discharge, monitoring)	0.5	staff	50,000	25,000	
Chemicals	1.0	mgd	70,000	70,000	
Treatment Supplies					
Membrane Replacement Accrual	1.0	mgd	22,000	22,000	
Other Materials and Supplies	@	3.5%		47,000	
Solids Disposal		LS		0	
Maintenance: Other		LS		0	
Contingency	@	5.0%		23,290	
Annual O&M Costs				**$489,090**	**$489,090**
				Total O&M Costs	$14,670,000
				Annual O&M ($/MG)	$2,700
				Annual O&M ($/1000 gal)	$3
				Annual O&M ($/AFY)	$870

CEQA/Permitting/Outreach	@	10%		1,300,000
Engineering/Construction Management	@	16%		$1,800,000
Legal	@	1%		$100,000
Administrative	@	2%		$200,000
Subtotal Engr/CM/Legal/Admin Costs				$2,100,000

Appendix F: SVWD Recycled Water Ordinances

Appendix F.1 - Excerpts from SVWD Ordinance No. 119-96 Rates, Rules and Regulations related to Recycled Water

- Article 4 Water Connection and Annexation Charges - Section 4.27 Water connection Charges
- Article 9 Water Recycling – Sections 8.1 to 8.7

Appendix F.2 – Memorandum of Agreement between Pasatiempo Golf Club and Scotts Valley Water District Expressing Intent to Implement "Pasatiempo Water conservation Initiative" In Cooperation with the City of Santa Cruz

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SCOTTS VALLEY WATER DISTRICT

ORDINANCE NO. 119-96,
RATES, RULES AND REGULATIONS

Adopted November 14, 1996

Amended January 9, 1997 By Ordinance 120-97
Amended February 13, 1997 By Ordinance 121-97
Amended October 9, 1997 By Ordinance 123-97
Amended February 12, 1998 By Ordinance 124-98
Amended June 11, 1998 By Ordinance 125-98
Amended November 12, 1998 By Ordinance 127-98
Amended August 12, 1999 By Ordinance 128-99
Amended September 9, 1999 By Ordinance 129-99
Amended April 18, 2000 By Ordinance 130-00
Amended January 9, 2001 By Ordinance 132-01
Amended June 13, 2002 By Ordinance 134-02
Amended April 10, 2003 By Ordinance 135-03
Amended February 12, 2004 By Ordinance 137-04
Amended July 8, 2004 By Ordinance 138-04
Amended October 14, 2004 by Ordinance 139-04
Amended February 10, 2005 by Ordinance 140-05
Amended April 13, 2006 by Ordinance 141-06
Amended May 18, 2006 by Ordinance 142-06
Amended February 15, 2007 by Ordinance 143-07
Amended April 12, 2007 by Ordinance 144-07
Amended October 11, 2007 by Ordinance 145-07
Amended March 11, 2008 by Ordinance 146-07

[See also, Ordinance 131-00 & its amendments concerning Replenishment Fees]

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ARTICLE FOUR

WATER CHARGES

District that abuts on or can be served by a water main or facility of the District constructed in August 1975 pursuant to the 6" ACP and 10" ACP, class 200, main extension required to serve Assessors Parcel No. 70-301-5 (SVCWD Service Order No. 1529) and for which the property on the other side of the street(s) was not assessed. The charge shall be the sum of One Thousand-six hundred-nineteen Dollars and Eighty-one cents ($1,619.81) as full and final payment to District. Such charge shall be payable in cash within ten (10) days of the date of the application to the District and prior to the connection to the District system or in such installments as may be provided in the event special assessment bond proceedings are conducted to finance the same.

Section 4.27 - Water Rates and Connection Charges[19]

(a) Regular water connection charges are hereby established as follows:

FIXED FEES PER EACH

SIZE (1)	*EFFECTIVE AS OF 7/1/93*	*EFFECTIVE AS OF 7/1/97*	*EFFECTIVE AS OF 7/1/01*	*EFFECTIVE AS OF 4/12/03*
5/8 x ¾"	$4,500	$5,250	$6,000	$6,000
1"	$11,250	$13,125	$15,000	$15,000
1-1/2"	$22,500	$26,250	$30,000	$30,000
2" Small System (Article 6)	N/A	N/A	N/A	$9,000
2"	$36,000	$42,000	$48,000	$48,000
3"	$67,500	$78,750	$90,000	$90,000
4"	$112,500	$131,250	$150,000	$150,000

(1) Cost increment by size based on Table 1 AWWA Section C700-77.

Surplus Water Connection Charges Are Established As Follows And In Effect Immediately

For any connections to areas beyond the District's boundaries, at one and one-half (1-1/2) times the regular water connection charges as set forth above.

[19] As Amended by Ordinances 127-98, 134-02, 135-03, 138-04, 140-05, 141-06 and 143-07; see also Ordinance 131-00 adopted August 1, 2000, establishing Replenishment Impact Fees.

(b) Water Connection Applications. In the event a water connection application is filed at any time within sixty (60) days prior to the effective date of a rate increase for Water Connection charges, and the application is completed and fees are paid not later than fifteen (15) days after the effective date of the rate increase, the fee to be charged for the Water Connection shall be the rate in effect at the time of filing the water connection application; otherwise, the fee to be charged in all cases shall be the rate in effect at the time of payment thereof is made.

(c) (1) Potable Water Commodity Charge.[20] The monthly rates for potable water consumed within the District are hereby established as follows:

MONTHLY WATER COMMODITY CHARGE, POTABLE WATER
(Rates Per Thousand Gallons of Consumption)

MONTHLY CONSUMPTION IN GALLONS	*Effective Feb. 15, 2007*	*Effective Dec. 15, 2007*	*Effective Dec. 15, 2008*
0 – 3,000	$2.81	$3.00	$3.19
3,001 - 7,000	$4.72	$5.03	$5.35
7,001 - 15,000	$5.73	$6.10	$6.50
15,001 - 25,000	$6.78	$7.22	$7.69
25,001 – 50,000	$8.52	$9.07	$9.66
Over 50,000	$9.09	$9.68	$10.31

(2) Recycled Water Commodity Charge. The monthly rates for recycled water consumed within the District are hereby established as 80% of the Monthly Water Commodity Charges for Potable Water.

(d) Surplus Water Commodity Charge. The monthly rates for all water consumed beyond the District's boundaries is hereby established as follows and in effect for all such consumption commencing with the District’s billing cycle on January 1, 1999:

One times the established water rate for service within the District boundaries.

[20] As amended most recently by Ordinance 143-07, adopted Feb. 15, 2007.

(e) (1) Potable Water Meter Service Charge.[21] The following monthly meter service charges are hereby established for each meter located within the District's boundaries, whether connected or not to the District's system, including meter order accounts held in reserve or otherwise not installed, according to meter size as follows:

MONTHLY METER SERVICE CHARGE

METER SIZE	*EFFECTIVE FEB. 15, 2007*	*EFFECTIVE DEC. 15, 2007*	*EFFECTIVE DEC. 15, 2008*
5/8 x 3/4”	$20.90	$22.26	$23.71
1”	$40.36	$42.99	$45.78
1-1/2”	$77.16	$82.18	$87.52
2” SMALL SYSTEM (ARTICLE 6)[22]	$30.58	$32.57	$34.69
2”	$115.96	$123.50	$131.53
3”	$175.79	$187.22	$199.39
4”	$266.17	$283.47	$301.90
6”	$528.61	$562.97	$599.56
PRIVATE FIRE PROTECTION SERVICE: Residential: Commercial:	 $9.68 $19.36	 $10.31 $20.62	 $10.98 $21.96

(2) Recycled Water Meter Charge: There will be no Monthly Service Charge for recycled water meters in the District.

(f) Surplus Meter Charge. The following monthly meter service charge is hereby established for each meter located beyond the District's boundaries, whether connected or not to the District's system, including meter order accounts held in reserve or otherwise not installed, according to meter size as follows:

One and one-half (1-1/2) times the established meter service charge for service within the District boundaries.

[21] As amended most recently by Ordinance 143-07, adopted February 15, 2007.
[22] Based on 5/8 x 3/4-inch meter charge plus private fire protection service charge.

(g) Other Charges.[23]

(1) Service Fees: District shall levy and collect a service fee for all projects requiring water service for the actual costs of any service provided by the District. The fees shall be paid in advance based upon a District estimate. Should actual District service fees be lesser or greater than estimated, the District will collect or refund the difference.

(2) The Board may establish other rates and charges as may, from time to time, be required.

(3) Connection Charge Adjustments. If regular connection charge fees are greater than those connection charge fees in force at the time that a meter(s) was ordered and for which a payment or deposit was made, the Applicant shall pay the lower fee plus one-half (1/2) the difference of the increased fee prior to actual installation of the meter.

(4) Unfixed Connection Charges. Where an Applicant desires a service connection for which a fee has not been established by the District, such connection charge shall be determined by written agreement with the District.

(5) Multiple Meters for Reliability. The District may require that two or more water meters be utilized to meet a particular demand so that repair work can be accomplished without a shutdown of water service. The Applicant shall pay for each of the smaller service connections at the fees established in Section 4.27.

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[23] Ordinance 130-00, adopted April 18, 2000, imposed Replenishment Assessment fees, but was not incorporated herein.

ARTICLE EIGHT

WATER RECYCLING

ARTICLE 8 - WATER RECYCLING

Section 8.1 - Findings, Purpose And Intent

(a) The people of the State of California and this District have a primary interest in recycling water to supplement existing surface and underground water supplies and to assist in meeting the future water requirements of the State (California Water Code Section 13510); and

(b) The maximum reuse of wastewater for beneficial purposes is required to conserve water resources (Water Code Section 461); and

(c) Where recycled water of suitable quality can be delivered at reasonable cost, continued irrigation and other uses of potable water for non-potable purposes constitutes an unreasonable use of water, and therefore is a nuisance.

Section 8.2 - Water Recycling Policy

It is the policy of the District that recycled water shall be used within its jurisdiction wherever feasible, and consistent with legal requirements, preservation of public health, safety and welfare, and the environment.

Section 8.3 - Administration

(a) General. The District shall construct a system of pipelines and appurtenances, separate from the potable water distribution system, to deliver recycled water for use at various locations in the District. The administration of this distribution system, of the sale of recycled water, and of Customer accounts, shall be subject to this Article.

(b) Recycled Water System Regulations. The Manager shall make and enforce regulations necessary to the administration of the recycled water system in accordance with state laws and guidelines, and may amend such regulations from time to time as conditions require. These regulations shall be consistent with the general policy established herein by the District.[28]

(c) Sales Agreements. The Manager may enter into agreements for the sale of recycled water to users outside the District's jurisdictional boundary. Such agreements shall contain conditions similar to those required of users within the

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[28] NOTE – see separately-bound Rules and Regulations adopted pursuant to Section 8.3(b), under Resolution 1-01, approved by DHS in April 2000 and adopted by SVWD Board February 2001.

District's jurisdiction that shall, however, be subject to the rates, charges and supply limitations as set forth in Section 8.6 (g).

Section 8.4 - Penalty For Violation

(a) Public Nuisance. The use of recycled water in any manner in violation of this ordinance, of any permit issued hereunder, or of the established Rules and Regulations is hereby declared a public nuisance and shall be corrected or abated as directed by the District. Any person creating such a public nuisance is guilty of a misdemeanor.

(b) Injunction. Whenever a use of recycled water is in violation of this Article or otherwise causes or threatens to cause a condition or nuisance, the District may seek injunctive relief as may be appropriate to enjoin such discharge or use.

(c) Permit Revocation. In addition to any other statute or rule authorizing termination of recycled water service, the District may revoke a permit issued hereunder if a violation of any provision of this ordinance is found to exist or if use of recycled water causes or threatens to cause a nuisance.

(d) Penalty. Any owner and/or operator who violates any penal provision of this ordinance shall, for each day of violation, or portion thereof, be subject to a fine not exceeding $600. In addition, recycled water and potable water service to the property may be discontinued.

Section 8.5 - Water Recycling Planning Document[29]

(a) General. Following adoption of this Article, District shall adopt a water recycling planning document to define, encourage, and develop the use of recycled water within its boundaries. The planning document shall be updated as appropriate. The planning may be covered in one or more documents covering specific portions of the planning area.

(b) Planning Document Contents. The planning document shall include, but not be limited to, the following:

(1) PLANTS AND FACILITIES. Evaluation of the location and size of present and future wastewater treatment and recycling

[29] See the "Engineering Report for Scotts Valley Water Recycling Project" by EOA, Inc., as revised January 2001.

plants, distribution pipelines, pump stations, reservoirs, and other related facilities, including cost estimates.

(2) RECYCLED WATER SERVICE AREAS. A designation of the areas within the District that can, immediately or in the future, use recycled water in lieu of potable water. Recycled water uses may include irrigation, industrial use and any other use permitted by state regulatory authorities.

(3) QUALITY OF WATER TO BE RECYCLED. An evaluation of recycled water quality with respect to its suitability for anticipated uses. If sufficient data is not available, the document may recommend sampling and monitoring programs to provide additional data.

(4) SCHEDULE. A schedule for implementation, including institutional arrangements, land acquisition, design, construction, startup, and facility phasing for each recycled water service area.

Section 8.6 - Mandatory Recycled Water Use

(a) General. No person or public agency, as used in Section 13551 of the California Water Code, shall use water from any source or of quality suitable for potable domestic use for irrigation of greenbelt areas, golf courses, agricultural, industrial, cleaning, toilet flushing (in nonresidential buildings) or similar non-potable uses, when non-potable recycled water of suitable quality can be supplied at reasonable cost.

(b) Identification of Users. Persons or agencies who are mandated to use recycled water are to be identified and permitted as described in this section.

(c) Existing Potable Water Service.

(1) PRELIMINARY DETERMINATION. Based upon the planning documents, the District shall make preliminary determinations as to which existing potable water Customers shall be converted to the use of recycled water. Each water Customer shall be notified of the basis for a determination that conversion to recycled water service will be required, as well as the proposed conditions and schedule for conversion.

(2) NOTICE. The notice of the preliminary determination, including the proposed permit conditions, time schedule for compliance and a recycled water permit application shall be sent to the water Customer by certified mail.

(3) OBJECTIONS. The water Customer may file a notice of objection with the Manager within thirty (30) days after any notice of determination to comply is delivered or mailed to the Customer, and may request reconsideration of the determination or modification of the proposed conditions or schedule for conversion. The objection must be in writing and specify the reasons for the objection. The preliminary determination shall be final if the Customer does not file a timely objection. The Manager shall review the objection and shall confirm, modify or abandon the preliminary determination. The Manager shall make a final determination within thirty (30) days of the filing of the notice of objection.

(d) <u>Development and Water Service Approvals</u>.

(1) CONDITIONS. Upon receipt of an application for potable water or other discretionary action, the District shall determine whether the proposed project shall be served with recycled water or must include provisions to allow future use of recycled water. Based upon such determination, an active Permit to Use Recycled Water may be a condition of approval of any such application, in addition to any other conditions of approval or service.

(2) CHANGES TO EXISTING SERVICES. Upon application for a change in water service, the District shall determine whether the subject change shall be served with recycled water or must include provisions to allow the future use of recycled water. Based upon such determination an active Permit to Use Recycled Water may be required as a condition of approval of the application.

(3) REQUESTED SERVICE. Upon application for a Permit to Use Recycled Water on a property not covered by Sections

(1) and (2) above, the District shall review the Project Report and make a determination whether the subject property shall be served with recycled water.

(e) Recycled Water Permit Process. Upon a final determination by the District that a property shall be served with recycled water, the water Customer, Owner or Applicant shall apply for and obtain a Permit to Use Recycled Water.

(1) PERMIT CONDITIONS. The permit shall specify the design and operational requirements for the Applicant's water distribution facilities and schedule for compliance, based on the provisions of this Article and adopted Rules and Regulations, and shall require compliance with all applicable regulatory requirements including the California Department of Health Services Wastewater Reclamation Criteria (see California Code of Administrative Regulations, Title 22), and requirements of the Regional Water Quality Control Board.

(2) PLAN APPROVAL. Plans for the recycled and potable water distribution systems for the parcel shall be reviewed by the District and a field inspection conducted before the permit is granted.

(3) PERMIT ISSUANCE. Upon approval of plans and fulfillment of other conditions specified in this Article and the Rules and Regulations, the permit shall be issued. Recycled water shall not be supplied to a property until inspection by the District determines that the Applicant is in compliance with the permit conditions.

(f) Temporary Use of Potable Water. At the discretion of the District, potable water may be made available for non-potable uses on a temporary basis, until recycled water is available. Before the Applicant receives temporary potable water, a recycled water permit, as described in Section (e), must be obtained for the on-site distribution facilities.

(g) Recycled Water Rate. The rate charged for recycled water shall be established by Resolution of the District.

Section 8.7 - Implementation Program

(a) Rules and Regulations. The District shall establish rules and regulations governing the use and distribution of recycled water.[30]

(b) Public Awareness Program. The District shall establish a comprehensive water recycling public awareness program.

(c) Coordination Among Agencies. The District shall coordinate efforts between the District, the City of Scotts Valley, and other regional agencies to share in the production and utilization of recycled water, where the potential exists.

(d) Financing Programs. The District may identify resources and adopt measures to assist water users in the financing of necessary conversions mandated by this Article

[30] NOTE – see separately-bound Rules and Regulations adopted pursuant to Section 8.3(b), under Resolution 1-01, approved by DHS in April 2000 and adopted by SVWD Board February 2001.

Appendix G: Table of Abbreviations

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Abbreviation	Description
ACH	Aluminum chlorohydrate
ADWF	Average dry weather flow
AF	acre-foot or acre-feet
AFY	acre-feet per year
AMBAG	Association of Monterey Bay Area Governments
AOP	Advanced oxidation process
APF	Advanced purification facility
Basin Plan	Central Coast Region Basin Plan
BMP	Best management practices
BOD	Biochemical Oxygen Demand
CCD	Closed circuit desalination
CCR	California Code of Regulations
CCRWQCB	Central Coast Regional Water Quality Control Board
CDPH	California Department of Public Health (predecessor agency to DDW)
CIP	Capital Improvement Plan
CIWMB	California Integrated Waste Management Board
City	City of Scotts Valley
County	County of Santa Cruz
CUWCC	California Urban Water Conservation Council
CY	Calendar Year
DBPs	Disinfection by products
District	Scotts Valley Water District
DDW	Division of Drinking Water
DPR	Direct Potable Reuse
EDCs	Endocrine disrupting compounds
FAT	Full advanced treatment

FOG	fat, oils and greases
FPR	Facilities Planning Report
GAC	Granular Activated Carbon
GIS	Geographic information system
gpd	Gallons per day
gpm	Gallons per minute
gpm/sf	Gallons per minute per square feet
GRRP	Groundwater Recharge Reuse Project
GWCUP	Groundwater Conjunctive Use Program
GWR	Groundwater Replenishment
IPR	Indirect potable reuse
IRWM	Integrated Regional Water Management
LID	Low Impact Development
MCLs	Maximum Concentration Levels
MF	Microfiltration
MG	Million gallons
mg/l	Milligrams per liter
MG	Million Gallons
MGD	Million gallons per day
MHA	Mount Hermon Association
ml	milliliters
MOA	Memorandum of Agreement
MPN	Maximum probable number
MRP	Monitoring and Reporting Program
NLs	Notification levels
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Units
O&M	Operation and Maintenance

pCi	Picocuries
Plan	Recycled Water Facilities Plan
PLC	Programmable logic controller
PPCPs	Pharmaceuticals and personal care products
ppm	Parts per million
PRV	Pressure reducing valve
psi	Pounds per square inch
PVC	Polyvinyl chloride
PWWF	Peak wet weather flow
RO	Reverse Osmosis
RW	Recycled Water
RWC	Recycled water contribution
RWQCB	Regional Water Quality Control Board
Santa Cruz	City of Santa Cruz
SB	Senate Bill
SCADA	Supervisory Control And Data Acquisition
Scotts Valley WRF	Scotts Valley Wastewater Reclamation Facility
SCWD	City of Santa Cruz Water Department
sf	square foot
SLVWD	San Lorenzo Valley Water District
SMGBAC	Santa Margarita Groundwater Basin Advisory Committee
SMGB	Santa Margarita Groundwater Basin
SVWD	Scotts Valley Water District
SWRCB	State Water Resources Control Board
TDH	total dynamic head
TDS	Total dissolved solids
TOC	Total Organic Carbon
TOrCs	Trace organic chemicals

TSS	Total Suspended Solids
UF	Ultrafiltration
USEPA	United States Environmental Protection Agency
UV	Ultraviolet
UWMP	Urban Water Management Plan
VOC	Volatile organic compounds
WDR	Waste Discharge Requirements
WQ	Water Quality
WQOs	Water Quality Objectives
WRF	Wastewater Reclamation Facility
WTPs	Water treatment plants

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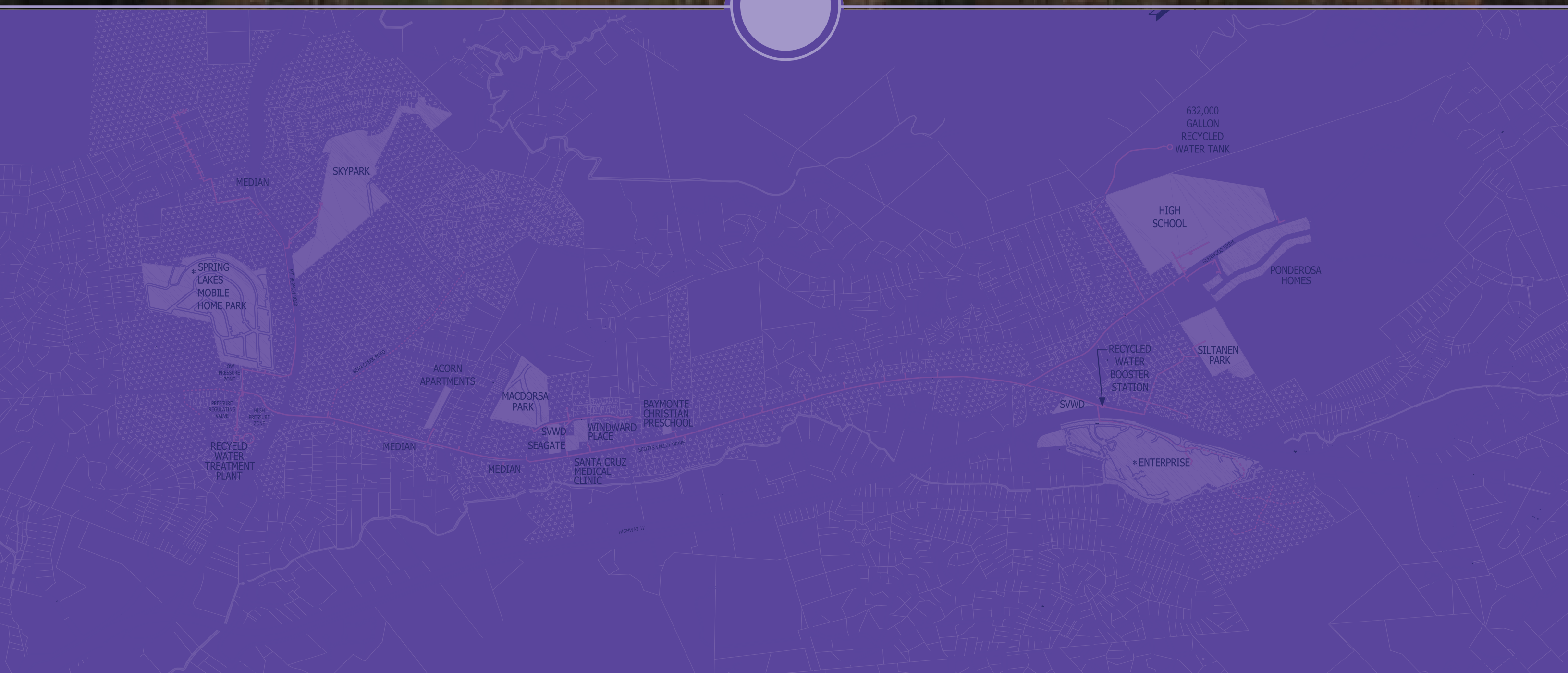
632,000 GALLON RECYCLED WATER TANK
MEDIAN
SKYPARK
HIGH SCHOOL
SPRING LAKES MOBILE HOME PARK
PONDEROSA HOMES
RECYCLED WATER BOOSTER STATION
SILTANEN PARK
ACORN APARTMENTS
MACDORSA PARK
BAYMONTE CHRISTIAN PRESCHOOL
SVWD
SVWD SEAGATE
WINDWARD PLACE
RECYELD WATER TREATMENT PLANT
MEDIAN
ENTERPRISE
MEDIAN
SANTA CRUZ MEDICAL CLINIC