

FINAL



City of Santa Ana Recycled Water Master Plan

March 2019



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SECTION 1 MAPS AND DIAGRAMS

This section presents maps and diagrams showing the vicinity of the study area, its water supply entities and proposed recycled water facilities.

1.1 Vicinity Map and Topographic Map

The vicinity map and topographic map are presented in Figure 1-1 and Figure 1-2 Topographic Map of the City of Santa Ana, respectively. Both maps provide a detailed delineation of the study area boundaries, which is the city boundary of the City of Santa Ana (City) in California.

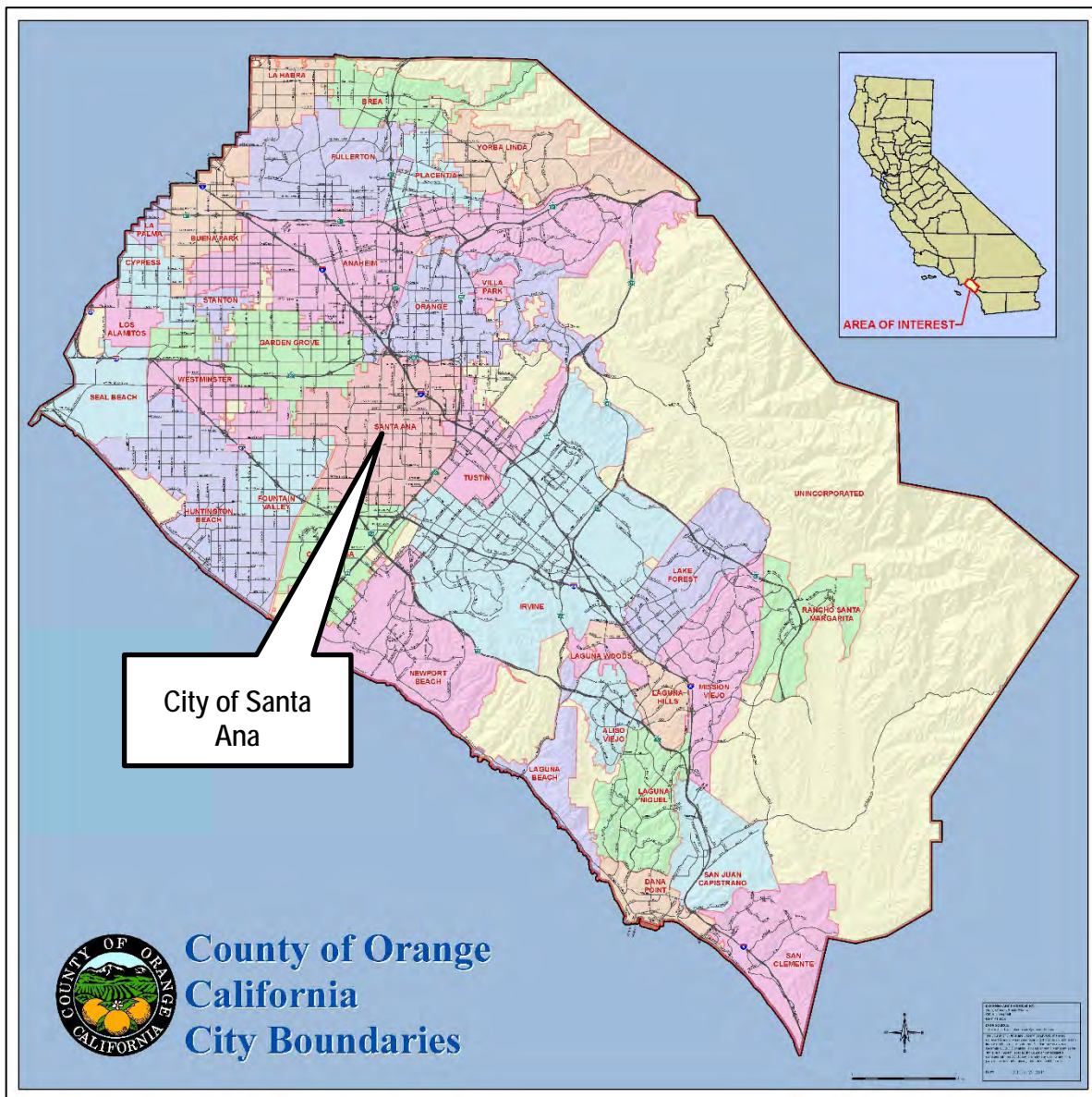


Figure 1-1 Vicinity Map of the City of Santa Ana

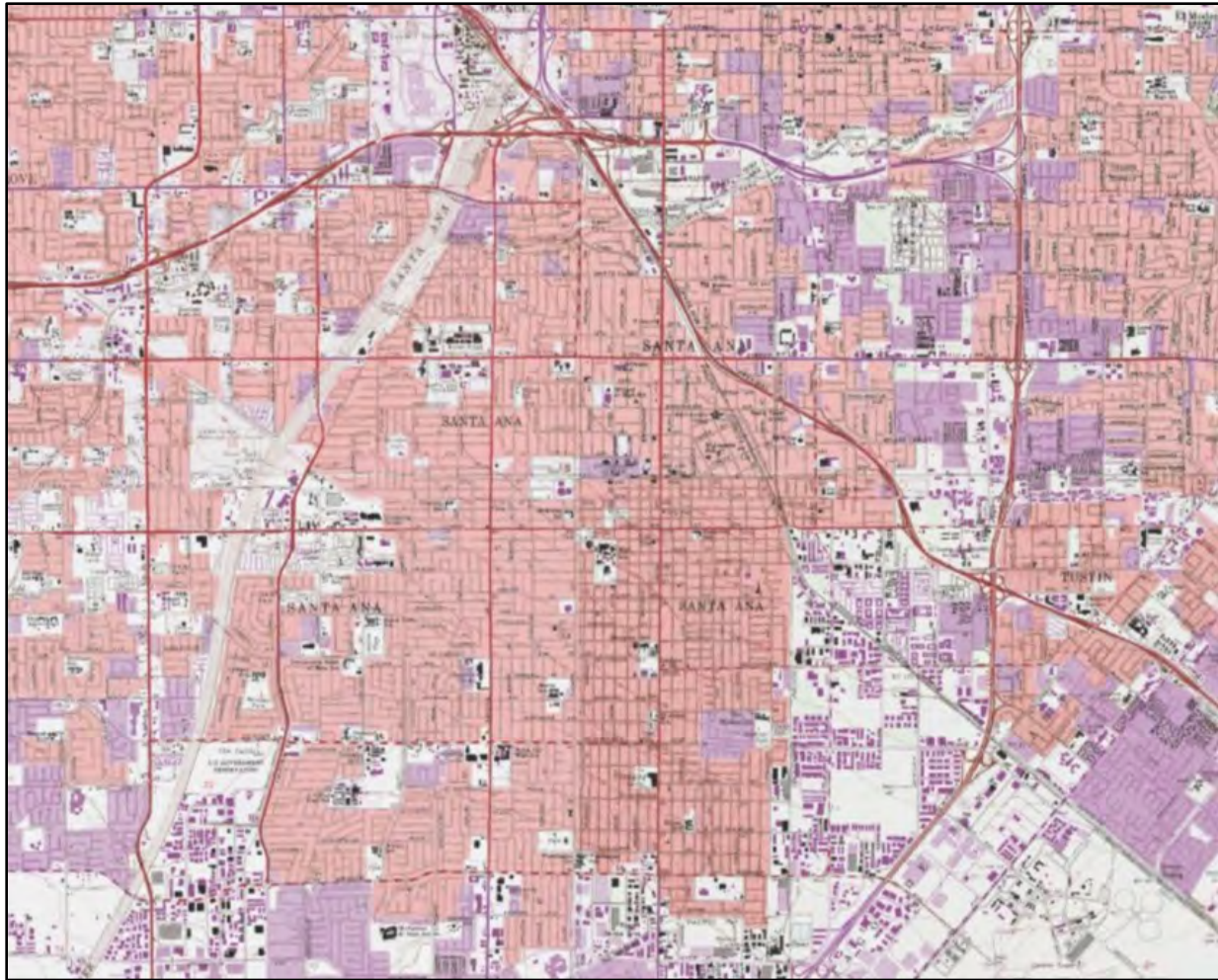


Figure 1-2 Topographic Map of the City of Santa Ana



1.2 Wholesale / Retail Water Supply Entity Boundaries Within Study Area and Adjacent to Study Area

The City's water supply consists of groundwater pumped from the Orange County Groundwater Basin and purchased treated surface water from the Metropolitan Water District (MWD). The City pays a replenishment assessment to the Orange County Water District (OCWD) for each acre-foot of water that is pumped out of the Orange County Groundwater Basin. The boundary of OCWD is shown in Figure 1-3. The City purchases treated surface water directly from MWD as a member agency. The boundary of MWD's member agencies and facilities is included in Figure 1-4. Orange County Water District's service area is presented in Figure 1-5.

The primary source of recycled water to the City will be from the OCWD Green Acres Project (GAP), and the OCWD Groundwater Replenishment System (GWRS). The Orange County Sanitation District's Fountain Valley Wastewater Treatment Facility is the source of the secondary effluent which OCWD treats to meet Title 22 requirements (tertiary disinfected recycled water). The GAP and GWRS pipelines, are presented in Figure 1-6 Orange County Water District's Green Acres Project (GAP) and Figure 1-7.

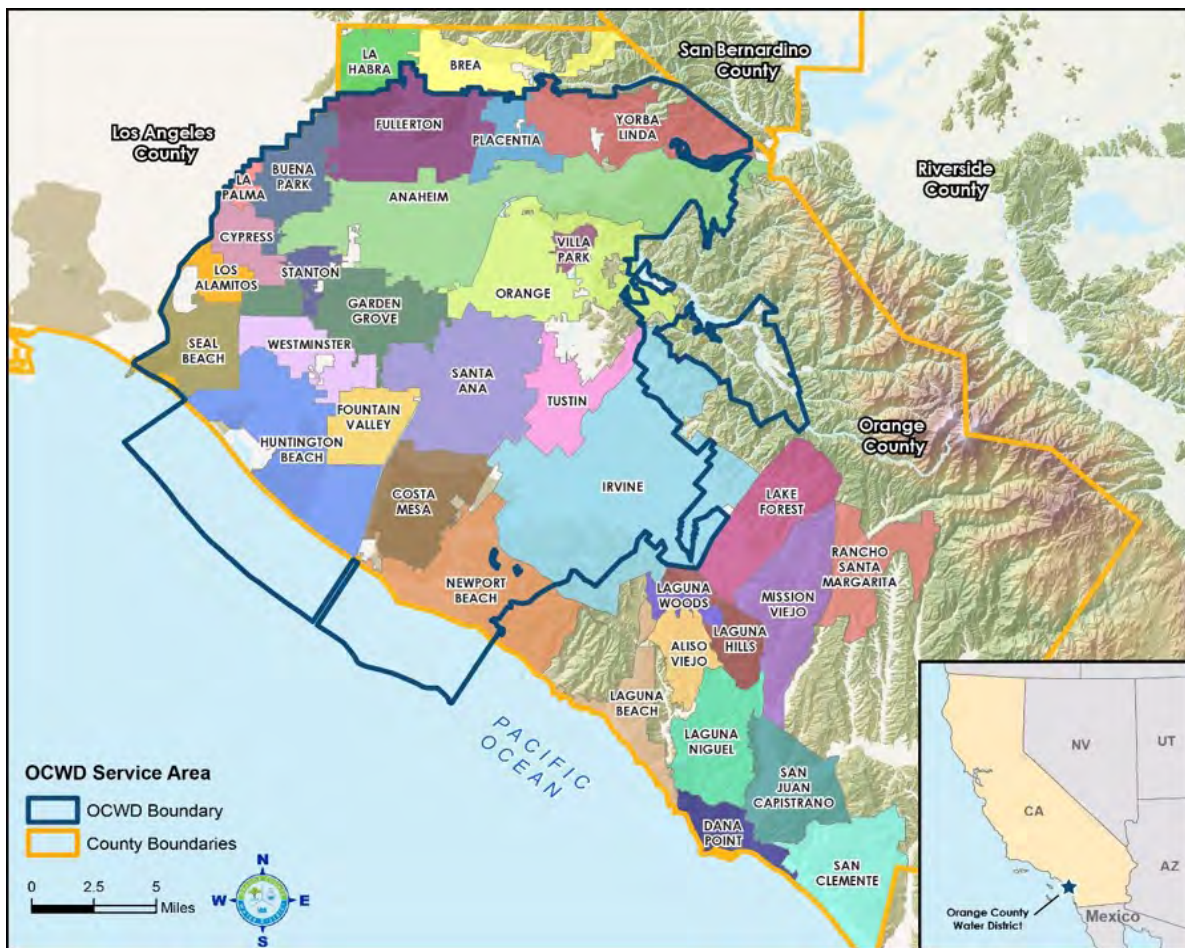


Figure 1-3 Boundary Map of the Orange County Water District



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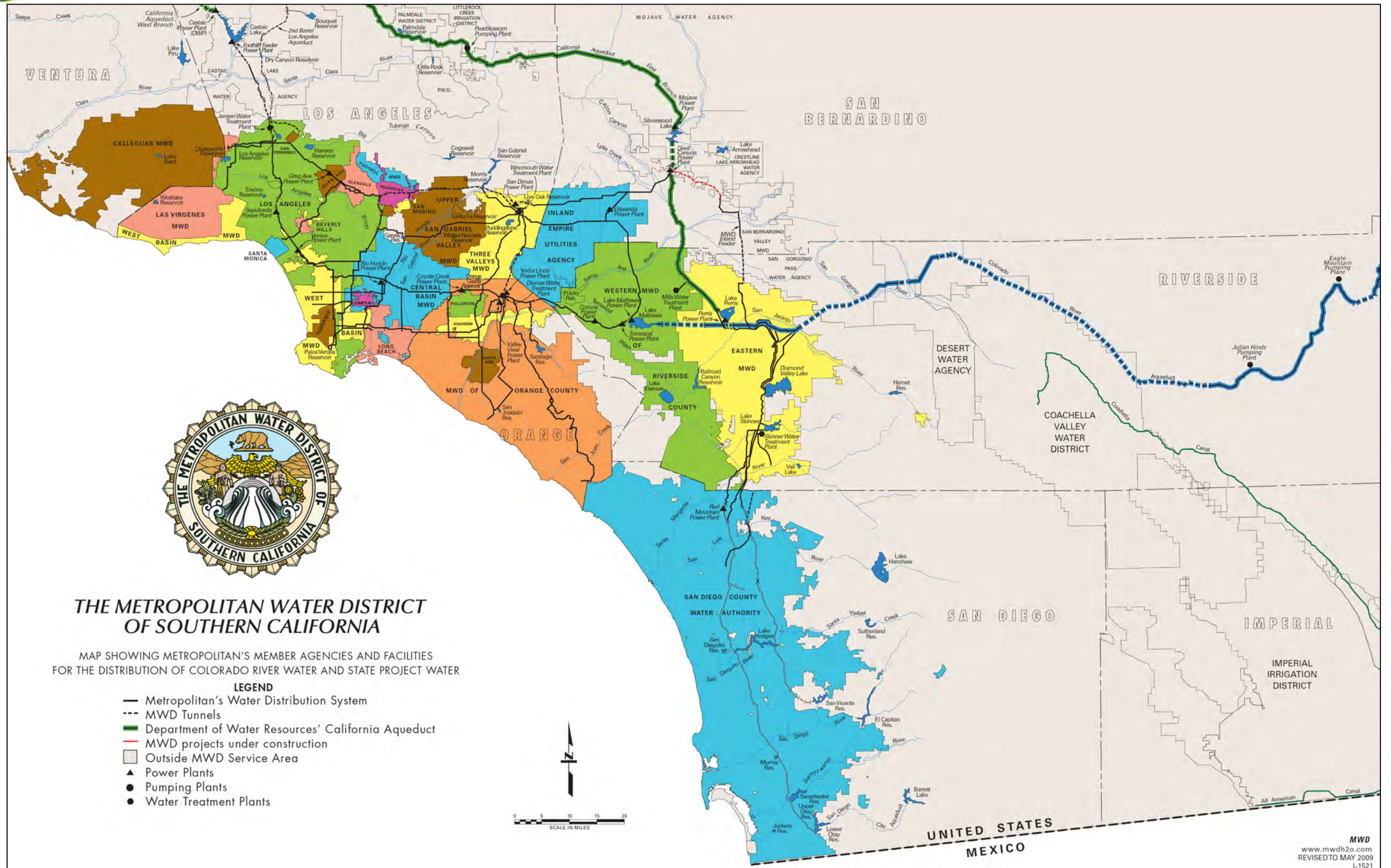


Figure 1-4 MWD's Service Area and Member Agencies



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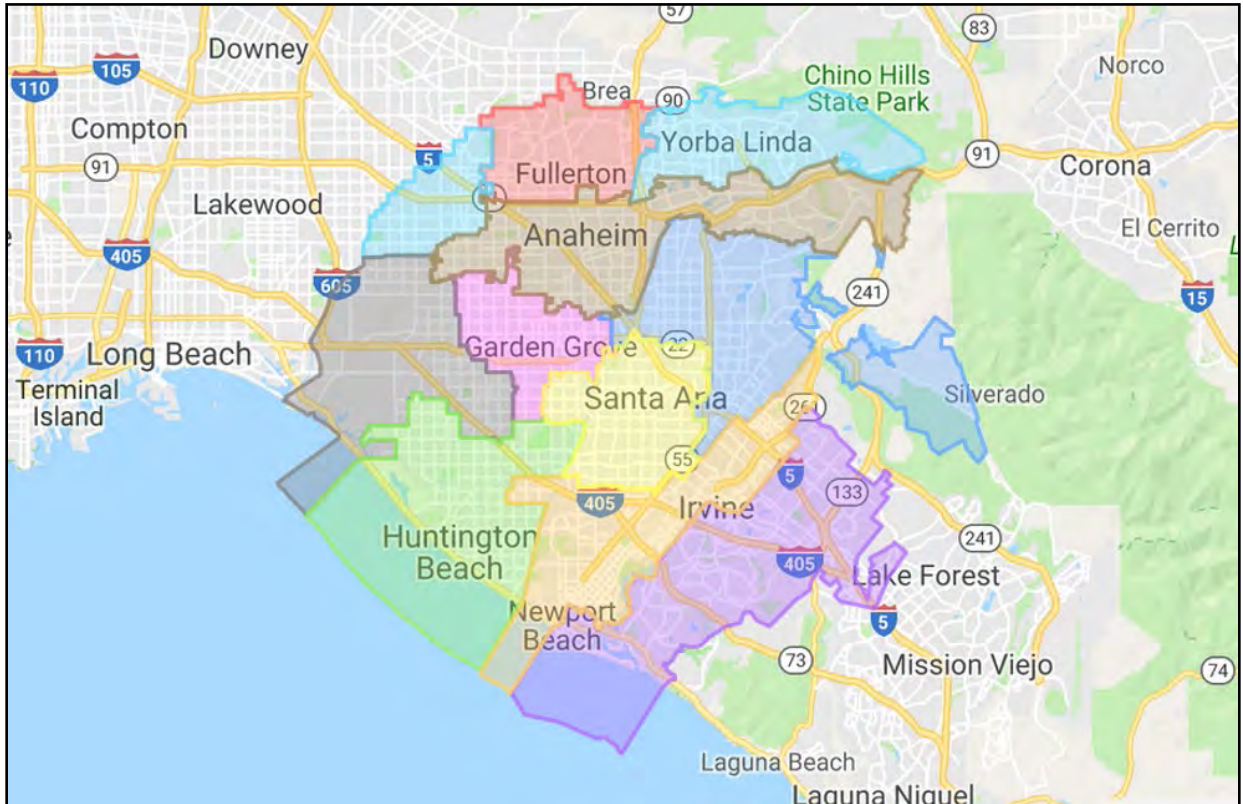


Figure 1-5 Orange County Water District Service Area



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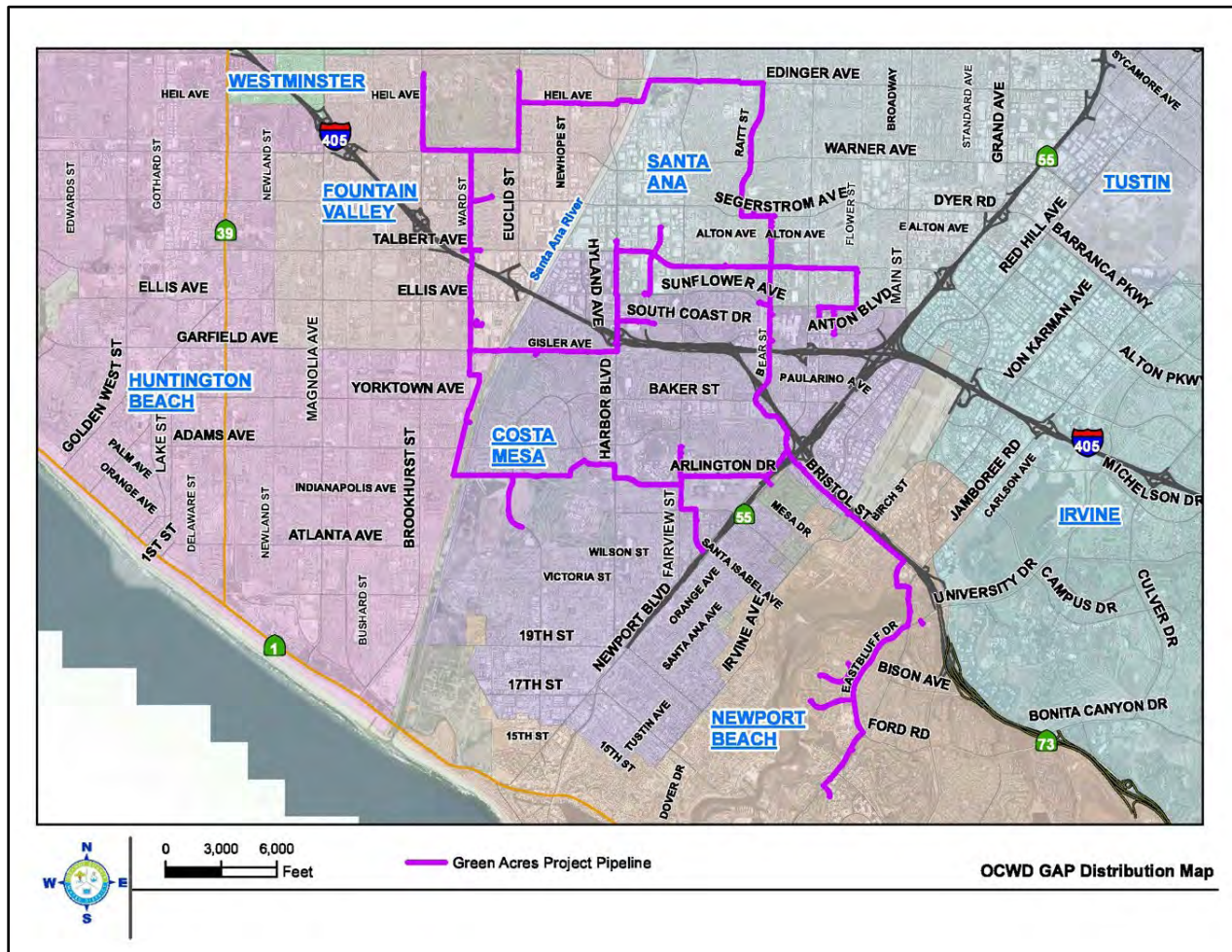


Figure 1-6 Orange County Water District's Green Acres Project (GAP)



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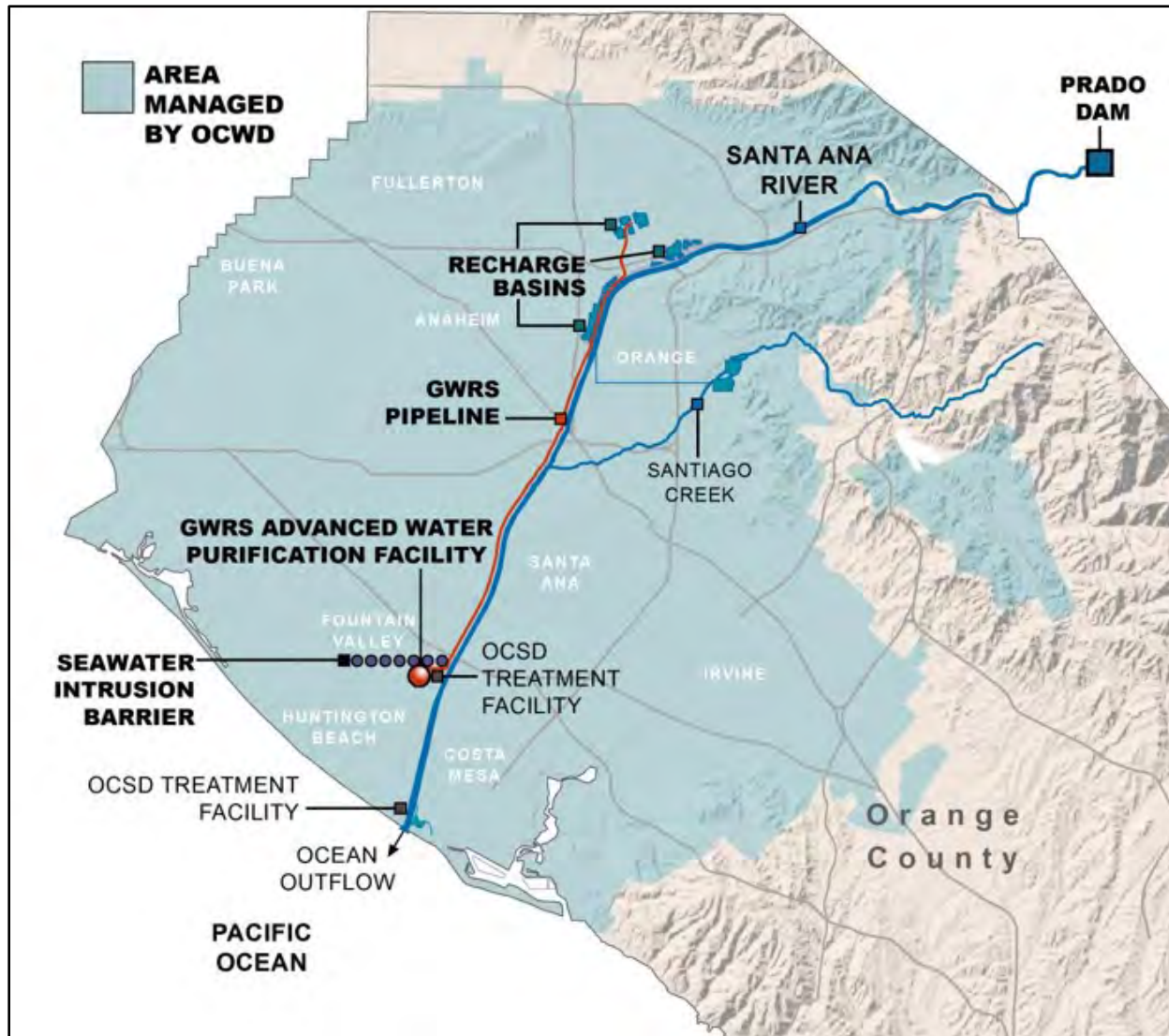


Figure 1-7 Orange County Water District's Groundwater Replenishment System (GWRS)



1.3 Wastewater Agency Boundaries Within and Adjacent to Study Area

Orange County Sanitation Districts (OCSD) provides wastewater and solid waste management services for approximately 2.6 million people throughout Orange County. OCSD's service area covers approximately 479 square miles and encompasses 20 cities, including the City of Santa Ana, two water districts, and unincorporated areas within the County. The City is served by the OCSD Regional Wastewater Plant located in Fountain Valley, CA. The OCSD service area is presented in Figure 1-8.

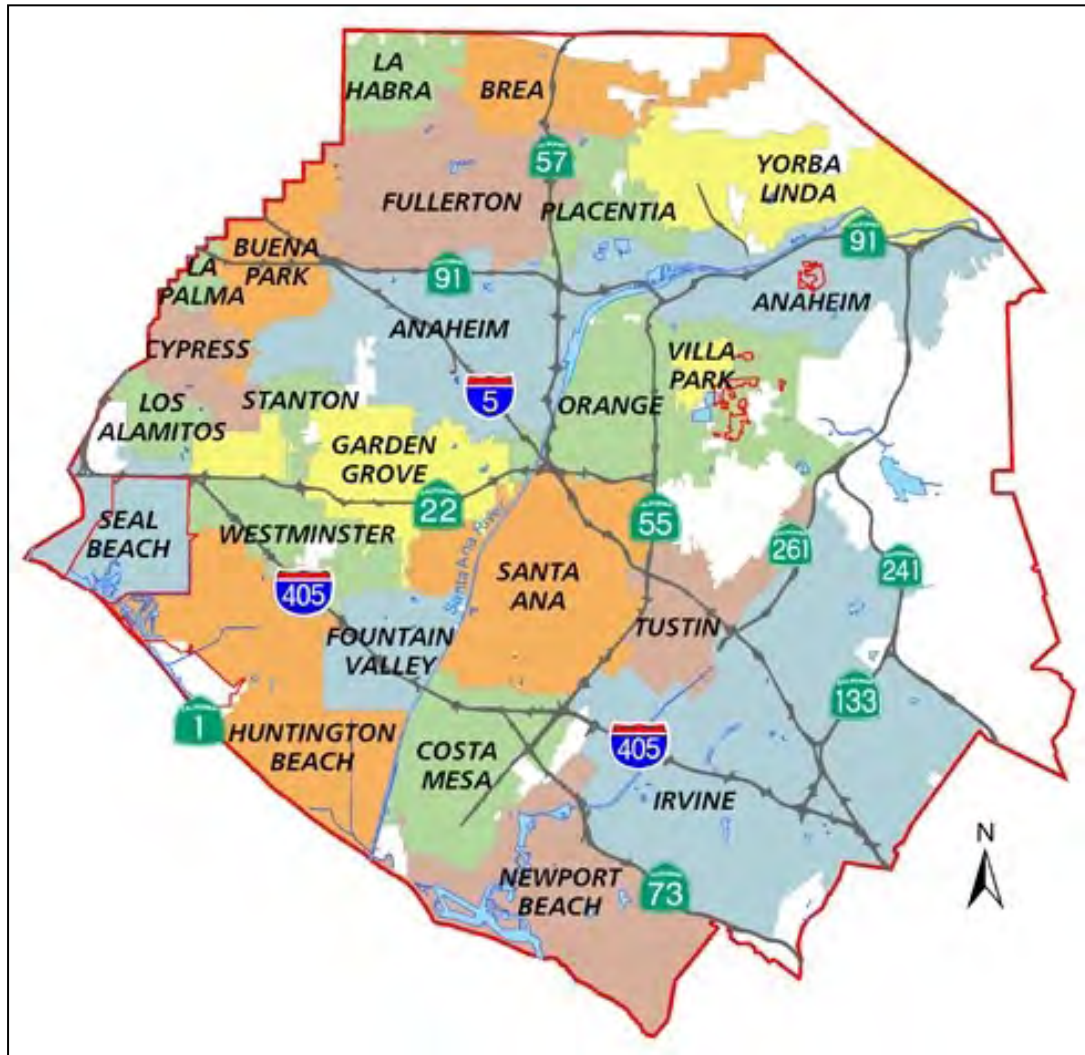


Figure 1-8 OCSD's Service Area

1.4 Potential Recycled Water Customers

There are several sites that are in Santa Ana that are served recycled water purchased from OCWD and distributed by OCWD through their GAP recycled water system. Figure 1-9 shows the shows the distribution of potential recycled water customers in the study area including parcels currently served recycled water.



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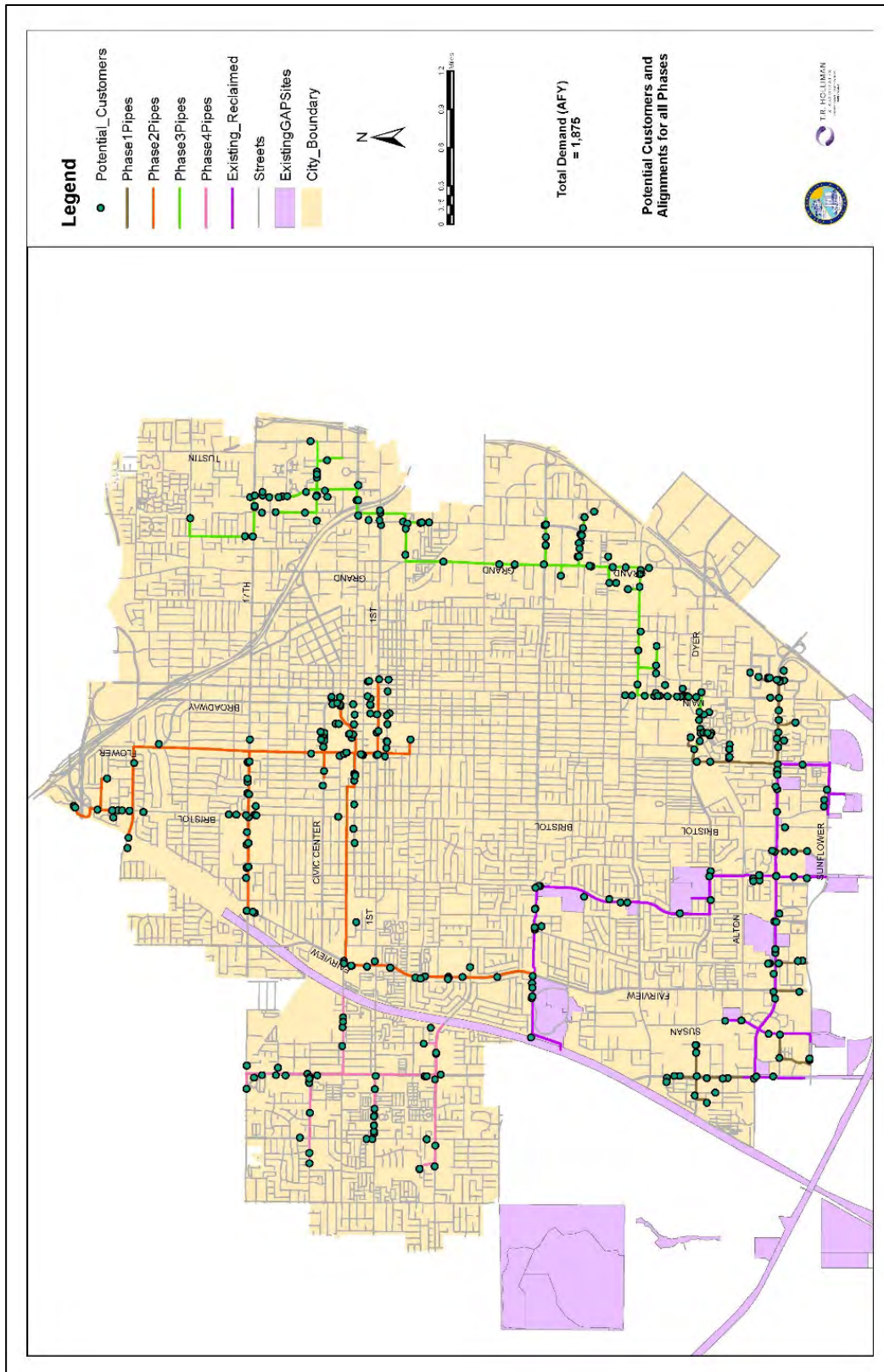


Figure 1-9 City of Santa Ana Potential Recycled Water Customers



1.5 Projected Land Use

A breakdown of existing land uses within the City of Santa Ana is listed in Section 2. Figure 1-10 City of Santa Ana General Land Use Map represents the City's most recent Land Use Map, which depicts the general pattern and boundaries of land use designations; however, it does not identify the timing or phasing of future development, as these are functions of the marketplace/economy.

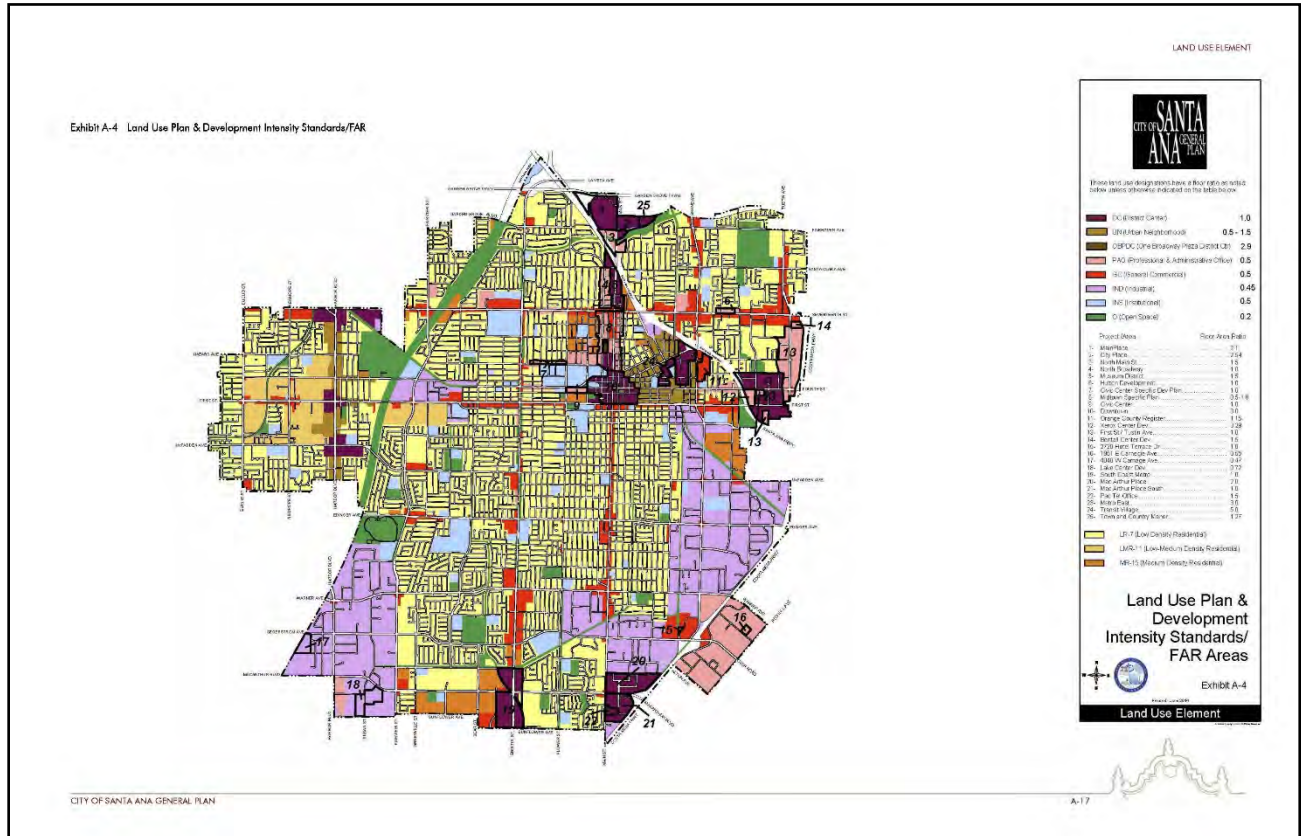


Figure 1-10 City of Santa Ana General Land Use Map

1.6 Recycled Water Facilities Alternatives

T.R. Holliman and Associates, Inc. (TRHA) considered two supply options for providing recycled water to the City:

1. Extending the existing OCWD GAP pipeline, and
2. Constructing a new turnout, reservoir, and pump station from the OCWD GWRS system.

TRHA developed four phases of recycled water conversions that are shown in Figure 1-11 City of Santa Ana Recycled Water System - Phase 1, Figure 1-12, Figure 1-13, and Figure 1-14. The total recycled water demand for that phase is also shown in the figures. TRHA recommends that the City only pursue Phase 1 based on the cost of service calculations prepared and shown in Section 7.



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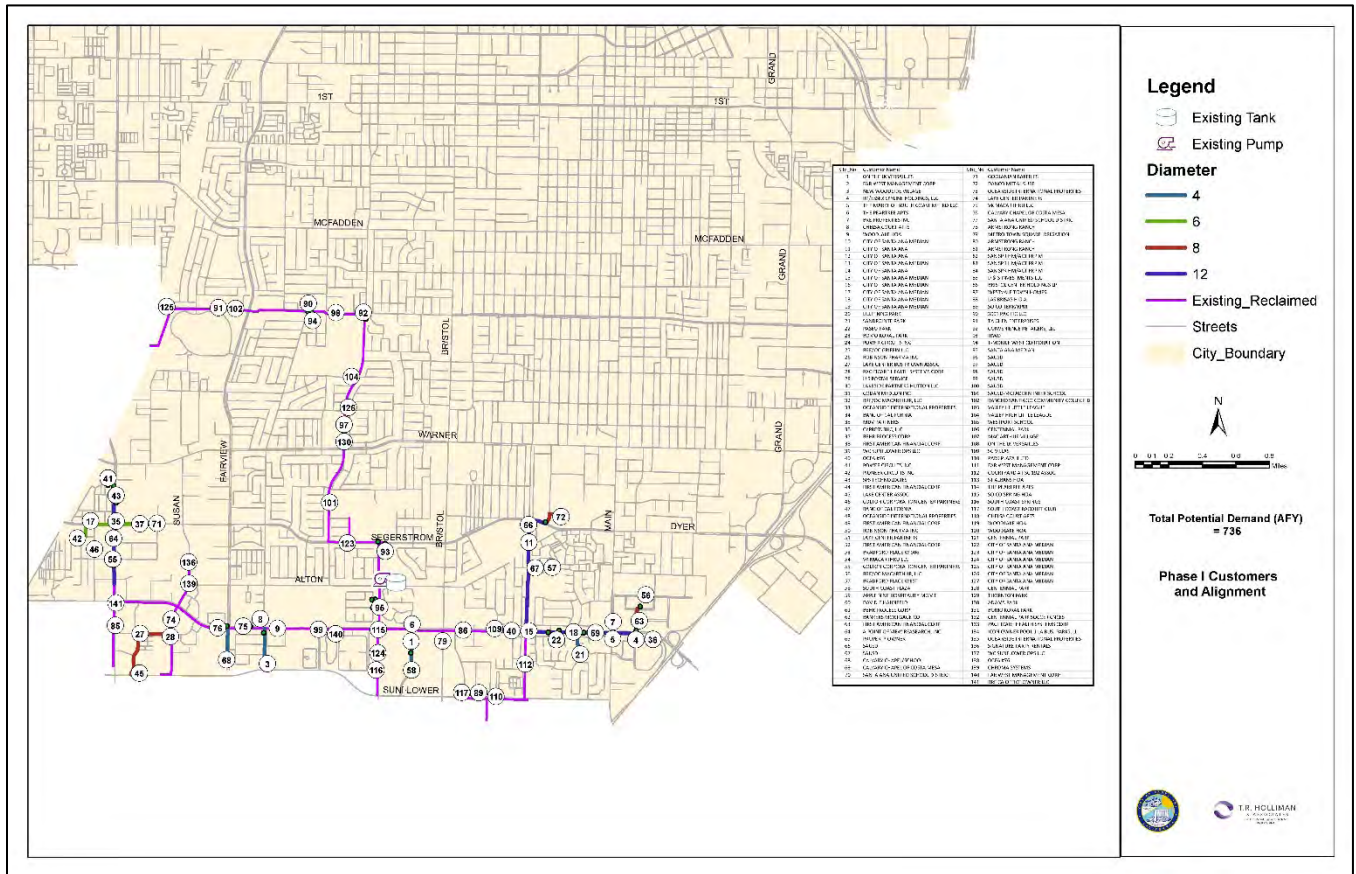


Figure 1-11 City of Santa Ana Recycled Water System - Phase I



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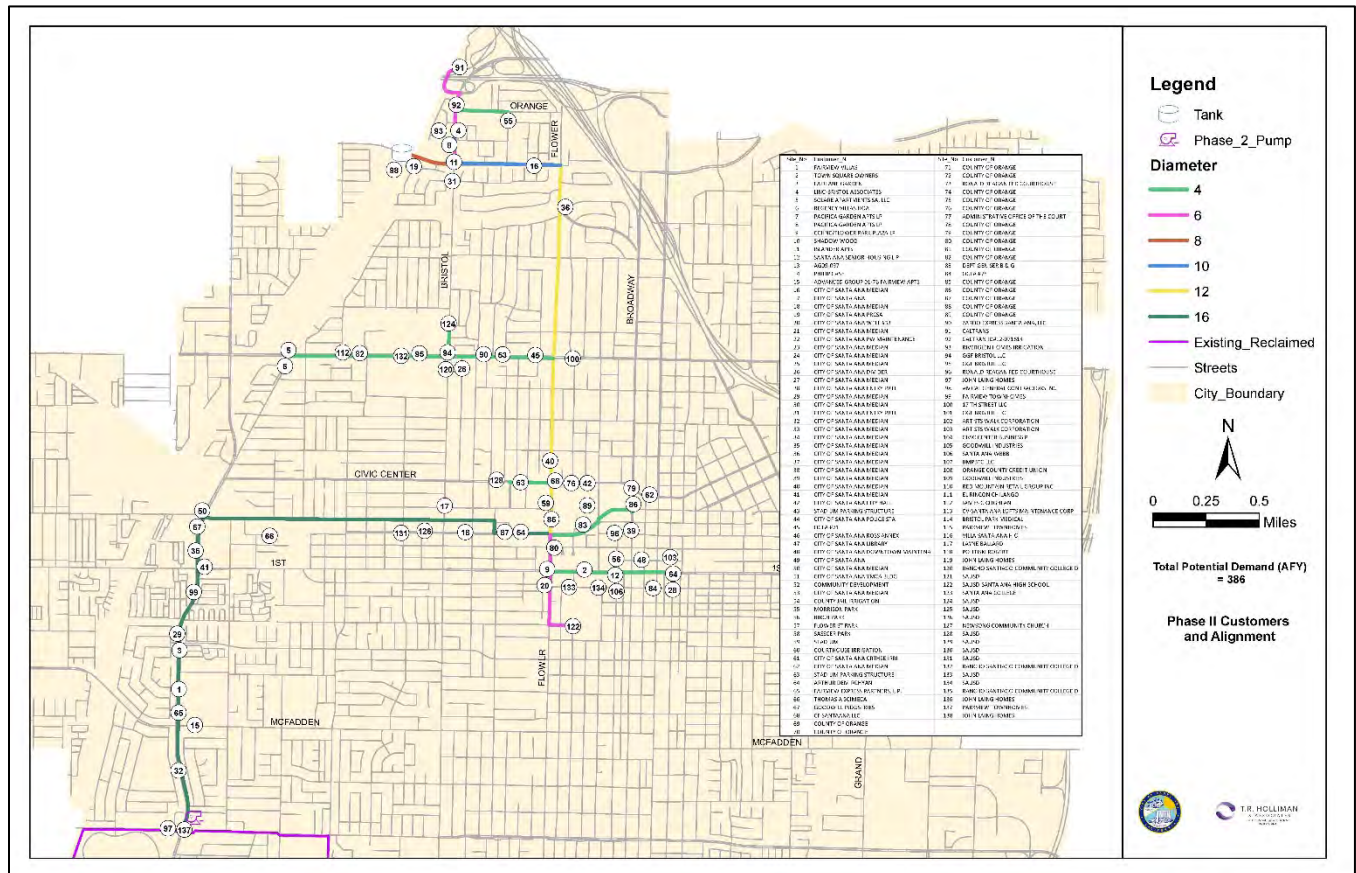


Figure 1-12 City of Santa Ana Recycled Water System - Phase 2



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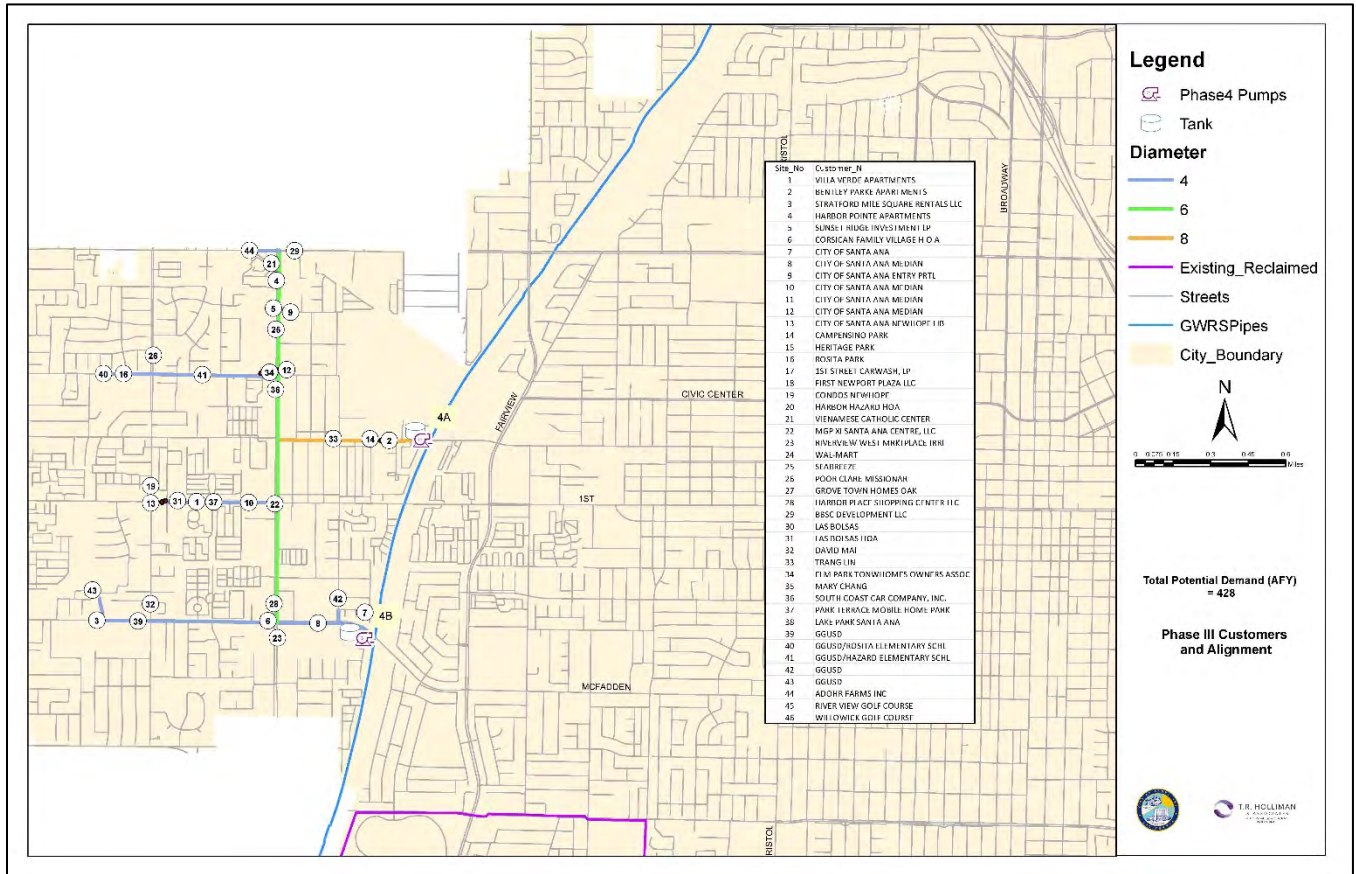


Figure 1-14 City of Santa Ana Recycled Water System - Phas3 4



1.7 Wastewater Treatment Schematic

The City's primary sources of recycled water are the OCWD Green Acres Project (GAP) and Groundwater Replenishment System (GWRS). The GAP and GWRS wastewater treatment schematics are shown in Figure 1-15 and Figure 1-16.

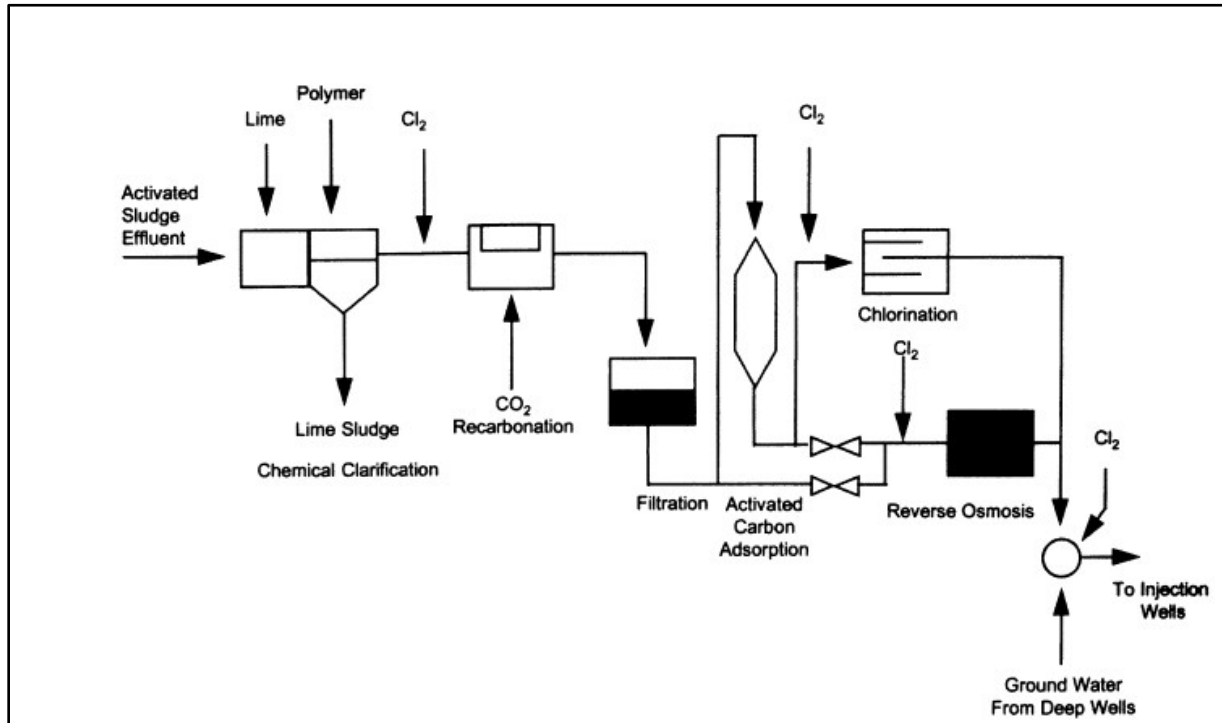


Figure 1-15 Process Train for Water Factory 21 (Green Acres Project - GAP)

The treatment process at Water Factory 21 (GAP) includes, activated sludge effluent, the addition of Lime and Polymer, chemical clarification, chlorination, CO₂ re-carbonation, filtration, activated carbon absorption, and reverse osmosis. The produced tertiary disinfected treated effluent meets all Title 22 requirements for reuse.



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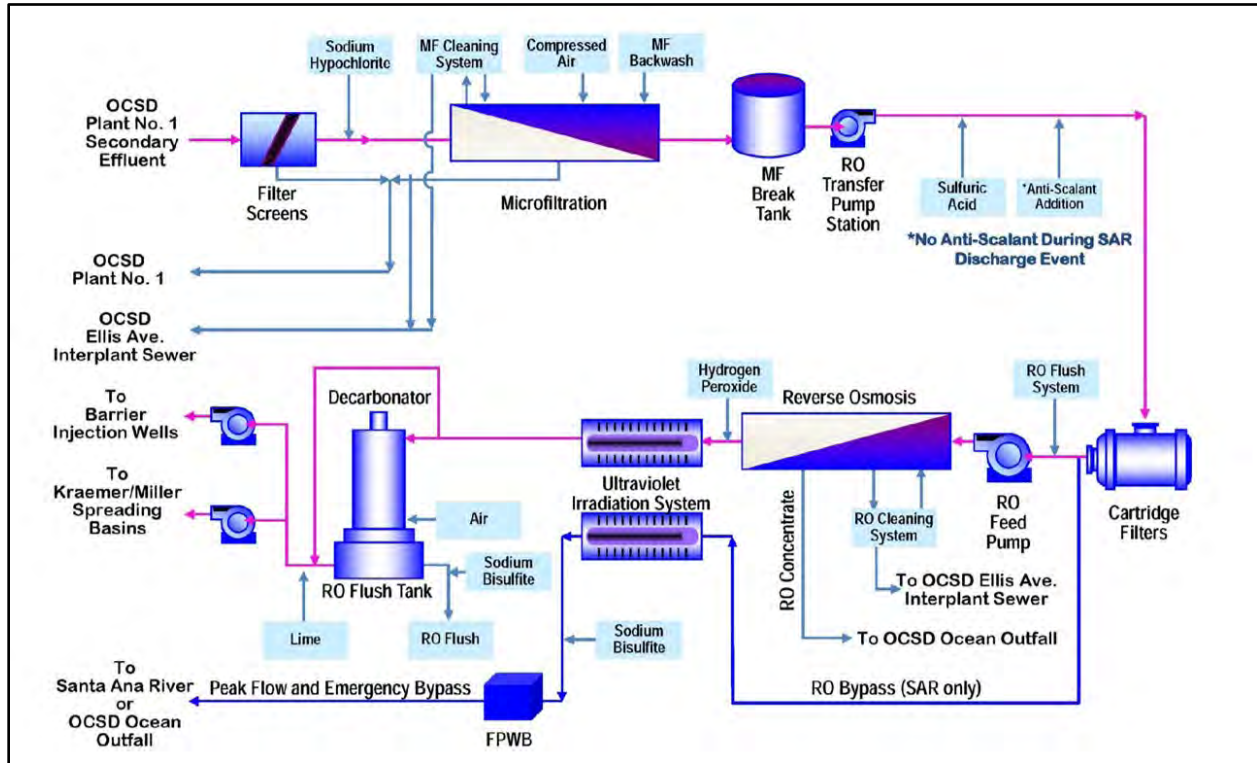


Figure 1-16 Process Train for Groundwater Replenishment System (GWRS)

The treatment process at the Groundwater Replenishment System (GWRS) includes, filtration, microfiltration, reverse osmosis, hydrogen peroxide, UV, and chemical addition of sodium hypochlorite, sulfuric acid, anti-scalant, sodium bisulfite, and lime. The produced tertiary disinfected treated effluent meets all Title 22 requirements for reuse and direct injection into the groundwater basin.



SECTION 2 STUDY AREA CHARACTERISTICS

This section summarizes the study area’s hydrologic features, information about the area’s groundwater basin, groundwater and surface water quality, land use trends, population projections, and information about beneficial uses of receiving waters.

2.1 Hydrologic Features

The principal surface water resource in the project area is the Santa Ana River which traverses the City from east to west. Surface water flow in the project area occurs as runoff, which generally follows the topographic features of the City flowing from north and south within the City’s boundary.

The City has an average annual rainfall of 13.6 inches for the 1981-2010 period. The region’s evapotranspiration (ET) rate is tracked through the California Irrigation Management Information System (CIMIS), a program in the Office of Water Use Efficiency (OWUE) of the California Department of Water Resources (DWR) that manages a network of over 120 automated weather stations throughout the state. ET is the loss of water to the atmosphere by the combined processes of evaporation (from soil and plant surfaces) and transpiration (from plant tissues). It is an indicator of how much water crops, lawn, garden, and trees need for healthy growth and productivity. ET from a standardized grass surface is commonly denoted as ETo. DWR considers the City as part of the Zone 6 – Upland Central Coast and Los Angeles Basin. Monthly average ETo’s for Zone 6, which includes the City, are shown in Table 2-1.

Table 2-1 Monthly Average ETo for Santa Ana Region

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.86	2.24	3.41	4.80	5.58	6.30	6.51	6.20	4.80	3.72	2.40	1.86

Source: CIMIS, 2012.

2.2 Groundwater Basin Information

Approximately 75 percent of the City’s water supply comes from its twenty groundwater production wells. The City pays a replenishment assessment to Orange County Water District (OCWD) for each acre-foot of water that is pumped out of the Orange County Basin. The amount of groundwater pumped by the City from 2011 to 2015 are presented in Table 2-2 Groundwater Pumped by the City of Santa Ana

Table 2-2 Groundwater Pumped by the City of Santa Ana

	2012/13	2013/14	2014/15	2015/16	2016/17
Groundwater Production (Acre-feet)	26,754	27,954	26,343	29,269	225,095

Source: Orange County Water District, “Engineers Report on the Groundwater Conditions, Water Supply and Basin Utilization in the Orange County Water District”, for 2012/13 through 2016/17



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The City relies on both groundwater and imported water for its potable supply. The City of Santa Ana 2017 Consumer Confidence Report, included in **Appendix A**, shows the results of the City's most recent testing of groundwater and surface water, performed in accordance with state and federal drinking water regulations.

2.3 City Land Use and Land Use Trends

2.3.1 Geographical Information

The City of Santa Ana is 27.5 square miles and located in Orange County, California. The City is bounded by the cities of Garden Grove, Tustin, Fountain Valley, Costa Mesa, and Irvine. Santa Ana is situated approximately 40 miles southeast of downtown Los Angeles and 10 miles east of the coast of California. The City is bounded approximately 1 mile north of the 405 Freeway and is bounded by the 22 Freeway on the north, and the 55 Freeway on the west, and is traversed by the 5 Freeway in the northern portion of the City. See **Figure 1-1** in **Section 1** for a map of the project area.

2.3.2 Historical Information

The Santa Ana area was explored in 1769 by a Spanish expedition led by Gaspar de Portolá. The first Spanish settlers who came to the area named the newly founded settlement Rancho Santiago de Santa Ana in honor of Saint Anne. It quickly became apparent that the ground was fertile for crops and cattle grazing. The city grew to become a farming community that fed the area.

As more people came to the area in the early 1860s, it was determined that the City would benefit from a planned layout. The community was officially laid out in 1869, and the plans for the city's development went into effect.

Following implementation of the plan, the city was renamed Santa Ana. With major growth from new arrivals to the area, local industries continued to grow. Santa Ana was selected to be the seat of Orange County.

Santa Ana quickly became a center for commercial, financial, and manufacturing businesses that today produce numerous electronic parts, sporting goods, and aerospace equipment. The city has become a major hub for much of the economic activity in southern California.

The city is home to numerous attractions. A sampler of places to visit might include the **Artists Village**, California State University - Fullerton, **Grand Central Art Center**, the **Santa Ana Zoo**, as well as a complex of artist residences, classrooms, and studios.

Santa Ana also is home to some of the finest artwork in the country. Examples of galleries include the **Bowers Museum of Cultural Art**, the **Discovery Museum of Orange County**, and the **Orange County Center for Contemporary Art**.



2.3.3 Existing Land Uses

The City is the fifth largest Orange County city in terms of land area, consisting of 27.3 square miles. Of this total, 58 percent is devoted to residential development, 15 percent to commercial uses, 14 percent to industrial, 11 percent to public and institutional uses, and two percent to public parkland and open space. The City's overall distribution of land use and development reflects its maturity as a commercial, employment, and governmental center. Land uses in Santa Ana are shown in Figure 2-1.

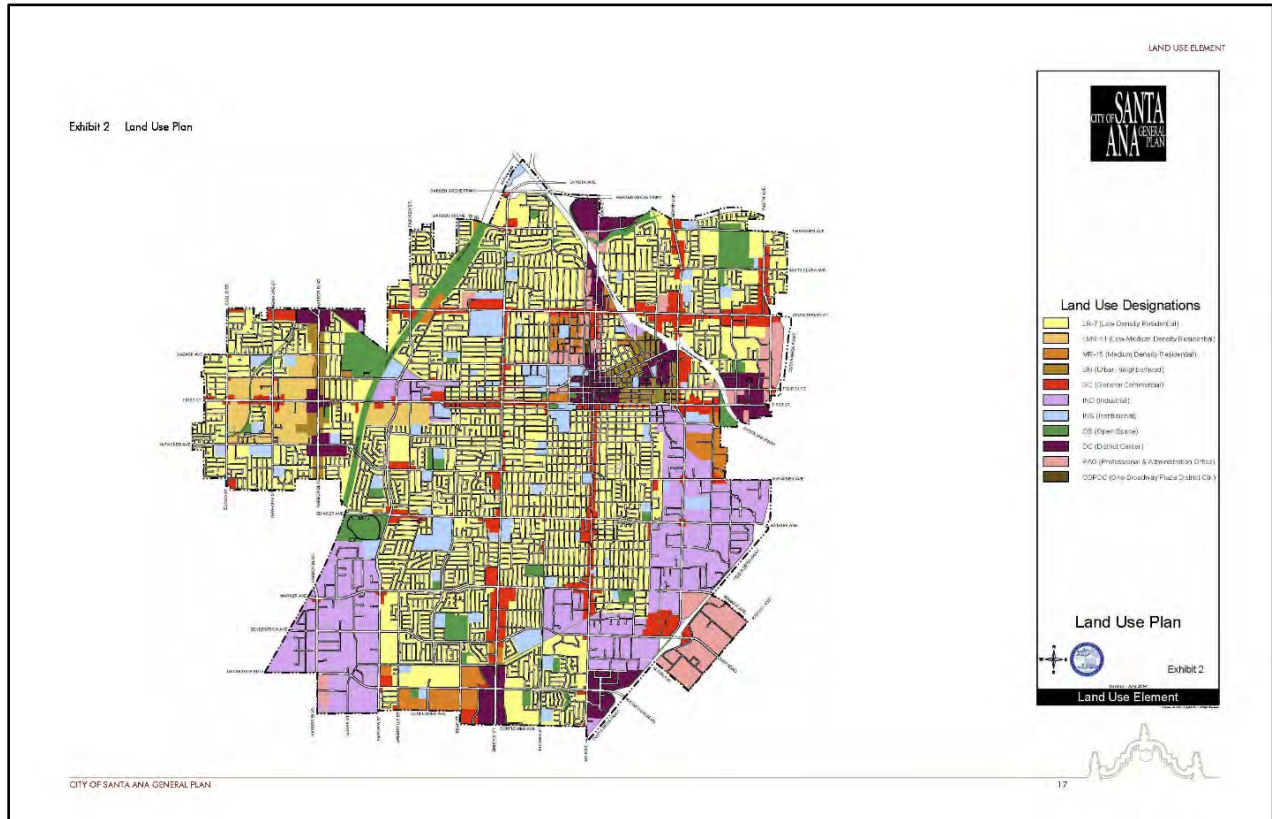


Figure 2-1 City of Santa Ana - Land Use Plan

2.3.4 Land Use Trends

As a historically mature settlement, the City of Santa Ana has been nearly fully developed for many years. As a result, any new development will necessarily consist of redevelopment, and infill on the remaining vacant and underutilized parcels. Many parcels with nonresidential land use designations will never be developed to the maximum population intensity permitted under the General Plan. The City is currently in the process of updating the General Plan.

The build-out for residential land uses considered two scenarios. Effective build-out for residential development is calculated by adding the 16,893 to 15,168 units possible in the areas designated as District Center to the existing 74,588 units presently found in the City per Census 2000. Theoretical build-out for residential development considered the development possible if all of the areas designated as residential were developed according to the permitted Land



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Use Plan intensities. Since the Land Use Element does not contemplate the elimination of existing housing in the City, the effective build-out figure represents a realistic estimate of future residential development.

Between 72,255 to 91,481 housing units are allowed by the Land Use Plan. The units which presently exist in the City, beyond the maximum number permitted under the theoretical buildout scenario, are a reflection of the higher density, multiple-family developments constructed in the 1970's and 1980's. However, the purpose of the Land Use Plan as it applies to the residential areas is to preserve and maintain the stability of existing neighborhoods, regardless of the character of development. The intent of the Plan is not to create any displacement nor decrease existing development densities. Rather, it is to ensure a safe, healthy, and livable environment for City residents. Existing residential development entitlements are protected through this Land Use Element, applicable Zoning regulations, and sections of the City code pertaining to legal nonconforming uses.

The Land Use Element's implementation may result in an increase in the amount of commercial, office, and industrial development in the City. Up to 33,678,013 square feet of commercial and office development, and 42,199,991 square feet of industrial development are possible under the effective capacity parameters of Land Use Plan.

2.4 Population Projections

The population of the City of Santa Ana was reported at 338,247 in 2018. Population for 2018 was obtained from the California State Department of Finance, Demographic Research Unit, 01/01/2018. The Southern California Association of Governments (SCAG) has forecasted the following population projections for the City of Santa Ana, according to SCAG's 2016-2040 RTP/SCS Final Growth Forecast by Jurisdiction. The years 2018 through 2040 are shown in **Table 2-3** City of Santa Ana Population Projections (2018-2040).

Table 2-3 City of Santa Ana Population Projections (2018-2040)

Year	2018	2020	2035	2040
Population	338,247	340,600	343,400	343,100
Year	2018	2020	2035	2040

Sources: SCAG 2016-2040 RTP/SCS Final Growth Forecast by Jurisdiction
California State Department of Finance, Demographic Research Unit, 01/01/2018

2.5 Beneficial Uses

The project area is located within the Santa Ana Region (Region 8) of the California Regional Water Quality Control Board. The Water Quality Control Plan is designed to preserve and enhance water quality, as well as protect the designated beneficial uses of the regional waters. However, there are no receiving waters within the City's boundaries and there are no anticipated impacts on the beneficial uses of the regional waters.



SECTION 3 WATER SUPPLY CHARACTERISTICS AND FACILITIES

3.1 Water Supply Wholesale and Retail Entities

The City operates its own municipal water system. Currently, the City relies on approximately 75 percent groundwater from its groundwater production wells, 28 percent imported water purchased from Metropolitan Water District of Southern California (MWD, METs, or Metropolitan), and 1 percent recycled water. The current recycled water demand within the City is approximately 320 acre-feet per year. The City pays a replenishment assessment to Orange County Water District (OCWD) for each acre-foot of water pumped out of the Orange County Groundwater Basin. OCWD is responsible for managing the water levels in the Orange County Groundwater Basin; overall, OCWD manages groundwater for nearly 2.4 million residents living within OCWD’s boundaries in Orange County supporting 19 major groundwater producers, including cities, water district and private water companies including the City of Santa Ana.

The actual sources and volume of water for the year 2015 to the City is displayed in **Table 3-1**.

Table 3-1 Water Supplies, Actual (AF)

Retail: Water Supplies — Actual			
Water Supply	Additional Detail on Water Supply	2015	
		Actual Volume	Water Quality
Groundwater	Orange County Groundwater Basin	26,351	Drinking Water
Purchased or Imported Water	Metropolitan	10,305	Drinking Water
Recycled Water	Green Acres Project (OCWD)	352	Recycled Water
Total		37,008	

The City does not have recycled water treatment plant within the City limits. There are two potential facilities that would provide additional recycled water to the City. The first system is the OCWD’s Green Acres Project (GAP) via the Bear Street Reservoir and pump station, which is owned and operated by the OCWD which current provides recycled water to the City and the second facility would be via the OCWD’s Groundwater Replenishment System (GWRS).

3.2 Sources of Water in Study Area and Major Facilities

The City supplements its water supply with imported water purchased from Metropolitan. Metropolitan’s principal sources of water are the Colorado River via the CRA and the Lake Oroville watershed in Northern California through the SWP. The water obtained from these sources is treated at the Robert B. Diemer Filtration Plant located north of



Yorba Linda. Typically, the Diemer Filtration Plant receives a blend of Colorado River water from Lake Mathews through the Metropolitan Lower Feeder and SWP water through the Yorba Linda Feeder. The City currently maintains seven imported water connections to the Metropolitan system.

3.3 Existing Conditions at Present Facilities

The City pumps groundwater through its twenty operating groundwater wells. A summary of the groundwater volume pumped by the City is shown in Table 3-2.

Table 3-2 Groundwater Volume Pumped (AF)

Retail: Groundwater Volume Pumped						
Groundwater Type	Location or Basin Name	2011	2012	2013	2014	2015
Alluvial Basin	Orange County Groundwater Basin	24,293	20,236	26,613	27,953	26,351
TOTAL		24,293	20,236	26,613	27,953	26,351

3.4 Groundwater Management, Recharge, and Overdraft Problems

3.4.1 Groundwater Management and Basin Production Percentage

The OC Basin is not adjudicated and as such, pumping from the OC Basin is managed through a process that uses financial incentives to encourage groundwater producers to pump a sustainable amount of water. The framework for the financial incentives is based on establishing the basin production percentage (BPP), the percentage of each Producer’s total water supply that comes from groundwater pumped from the OC Basin. Groundwater production at or below the BPP is assessed a Replenishment Assessment (RA). While there is no legal limit as to how much an agency pumps from the OC Basin, there is a financial disincentive to pump above the BPP. Agencies that pump above the BPP are charged the RA plus the Basin Equity Assessment (BEA), which is calculated so that the cost of groundwater production is greater than MWD’s full-service rate. The BEA can be increased to discourage production above the BPP. The BPP is set uniformly for all Producers by OCWD on an annual basis.

The BPP is set based on groundwater conditions, availability of imported water supplies, and basin management objectives. The supplies available for recharge must be estimated for a given year. The supplies of recharge water that are estimated are: 1) Santa Ana River stormflow, 2) Natural incidental recharge, 3) Santa Ana River baseflow, 4) GWRS supplies, and 5) other supplies such as imported water and recycled water purchased for the Alamitos Barrier. The BPP is a major factor in determining the cost of groundwater production from the OC Basin for that year.



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In some cases, OCWD encourages treating and pumping groundwater that does not meet drinking water standards in order to protect water quality. This is achieved by using a financial incentive called the BEA Exemption. A BEA Exemption is used to clean up and contain the spread of poor-quality water. OCWD uses a partial or total exemption of the BEA to compensate a qualified participating agency or Producer for the costs of treating poor quality groundwater. When OCWD authorizes a BEA exemption for a project, it is obligated to provide the replenishment water for the production above the BPP and forgoes the BEA revenue that OCWD would otherwise receive from the producer (OCWD, Groundwater Management Plan 2015 Update, June 2015).

3.4.1.1 2015 OCWD Groundwater Management Plan

OCWD was formed in 1933 by the California legislature to manage and operate the OC Basin in order to protect and increase the OC Basin's sustainable yield in a cost-effective manner. As previously mentioned, the BPP is the primary mechanism used by OCWD to manage pumping in the OC Basin. In 2013, OCWD's Board of Directors adopted a policy to establish a stable BPP with the intention to work toward achieving and maintaining a 75 percent BPP by FY 2015-16. Although BPP is set at 75 percent, based on discussions with OCWD a conservative BPP of 70 percent is assumed through 2040. Principles of this policy include:

- OCWD's goal is to achieve a stable 75 percent BPP, while maintaining the same process of setting the BPP on an annual basis, with the BPP set in April of each year after a public hearing has been held and based upon the public hearing testimony, presented data, and reports provided at that time.
- OCWD would endeavor to transition to the 75 percent BPP between 2017 and 2019 as construction of the GWRS Final Expansion Project is completed. This expansion will provide an additional 31,000 AFY of water for recharging the groundwater basin.
- OCWD must manage the OC Basin in a sustainable manner for future generations. The BPP will be reduced if future conditions warrant the change.
- Each project and program to achieve the 75 percent BPP goal will be reviewed individually and assessed for their economic viability.

The OC Basin's storage levels would be managed in accordance to the 75 percent BPP policy. It is presumed that the BPP will not decrease as long as the storage levels are between 100,000 and 300,000 AF from full capacity. If the OC Basin is less than 100,000 AF below full capacity, the BPP will be raised. If the OC Basin is over 350,000 AF below full capacity, additional supplies will be sought after to refill the OC Basin and the BPP will be lowered.

The OC Basin is managed to maintain water storage levels of not more than 500,000 AF below full condition to avoid permanent and significant negative or adverse impacts. Operating the OC Basin in this manner enables OCWD to encourage reduced pumping during wet years when surface water supplies are plentiful and increase pumping during dry years to provide additional local water supplies during droughts.

OCWD determines the optimum level of storage for the following year when it sets the BPP each year. Factors that affect this determination include the current storage level, regional water availability, and hydrologic conditions. When the OC Basin's storage approaches the lower end of the operating range, immediate issues that must be addressed



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include seawater intrusion, increased risk of land subsidence, and potential for shallow wells to become inoperable due to lower water levels (OCWD, Groundwater Management Plan 2015 Update, June 2015).

3.4.2 Groundwater Recharge Facilities

Recharging water into the OC Basin through natural and artificial means is essential to support pumping from the OC Basin. Active recharge of groundwater began in 1949, in response to increasing drawdown of the OC Basin and consequently the threat of seawater intrusion. The OC Basin's primary source of recharge is flow from the Santa Ana River, which is diverted into recharge basins and its main Orange County tributary, Santiago Creek. Other sources of recharge water include natural infiltration, recycled water, and imported water. Natural recharge consists of subsurface inflow from local hills and mountains, infiltration of precipitation and irrigation water, recharge in small flood control channels, and groundwater underflow to and from Los Angeles County and the ocean.

Recycled water for the OC Basin is from two sources. The main source of recycled water is from the GWRS and is recharged in the surface water system and the Talbert Seawater Barrier. The second source of recycled water is the Leo J. Vander Lans Treatment Facility which supplies water to the Alamos Seawater Barrier. Injection of recycled water into these barriers is an effort by OCWD to control seawater intrusion into the OC Basin. Operation of the injection wells forms a hydraulic barrier to seawater intrusion.

Untreated imported water can be used to recharge the OC Basin through the surface water recharge system in multiple locations, such as Anaheim Lake, Santa Ana River, Irvine Lake, and San Antonio Creek. Treated imported water can be used for in-lieu recharge, as was performed extensively from 1977 to 2007 (OCWD, Groundwater Management Plan 2015 Update, June 2015).

OCWD, MWDOC, and Metropolitan have developed a successful and efficient groundwater replenishment program to increase storage in the OC Basin. The Groundwater Replenishment Program allows Metropolitan to sell groundwater replenishment water to OCWD and make direct deliveries to agency distribution systems in lieu of producing water from the groundwater basin when surplus surface water is available. This program indirectly replenishes the OC Basin by avoiding pumping. In the in-lieu program, OCWD requests an agency to halt pumping from specified wells. The agency then takes replacement water through its import connections, which is purchased by OCWD from Metropolitan. OCWD purchases the water at a reduced rate, and then bills the agency for the amount it would have had to pay for energy and the RA if it had produced the water from its wells. The deferred local production results in water being left in local storage for future use.

3.4.3 Overdraft

Annual groundwater basin overdraft, as defined in OCWD's Act, is the quantity by which production of groundwater supplies exceeds natural replenishment of groundwater supplies during a water year. This difference between extraction and replenishment can be estimated by determining the change in volume of groundwater in storage that would have occurred had supplemental water not been used for any groundwater recharge purpose, including seawater intrusion protection, advanced water reclamation, and the in-Lieu Program.



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The annual analysis of basin storage changes and accumulated overdraft for water year 2015-16 has been completed. Based on the three-layer methodology, an accumulated overdraft of 342,000 AF was calculated for the water year ending June 30, 2016. The accumulated overdraft for the water year ending June 30, 2016 was 242,000 AF, which was also calculated using the three-layer storage method. Therefore, an annual decrease of 100,000 AF in stored ground-water was calculated as the difference between the June 2015 and June 2016 accumulated overdrafts (OCWD, 2015-2016 Engineer's Report, February 2017).

3.5 Water Use Trends and Future Demands, Prices and Costs

In the 2015 UWMP, the City may update its 2020 water use target by selecting a different target method than what was used in 2010. The target methods and determination of the 2015 and 2020 targets are described below:

3.5.1 SBx7-7 Target Methods

DWR has established four target calculation methods for urban retail water suppliers to choose from. The City is required to adopt one of the four options to comply with SBx7-7 requirements. The four options include:

1. Option 1 requires a simple 20 percent reduction from the baseline by 2020 and 10 percent by 2015.
2. Option 2 employs a budget-based approach by requiring an agency to achieve a performance standard based on three metrics:
 - Residential indoor water usage of 55 GPCD
 - Landscape water use commensurate with the Model Landscape Ordinance
 - 10 percent reduction in baseline commercial/industrial/institutional (CII) water use
3. Option 3 is to achieve 95 percent of the applicable state hydrologic region target as set forth in the State's 20x2020 Water Conservation Plan.
4. Option 4 requires the subtraction of Total Savings from the baseline GPCD:
Total savings includes indoor residential savings, meter savings, CII savings, and landscape and water loss savings.

With MWDOC's assistance in the calculation of the City's base daily per capita use and water use targets, the City selected to comply with Option 3 consistent with the option selected in 2010.

3.5.2 2015 and 2020 Targets

Under Compliance Option 3, to achieve 95 percent of the South Coast Hydrologic Region target as set forth in the State's 20x2020 Water Conservation Plan, the City's 2015 target is 123 GPCD and the 2020 target is 116 GPCD as summarized in **Table 3.3**. The 2015 target is the midway value between the 10-year baseline and the confirmed 2020 target. In addition, the confirmed 2020 target needs to meet a minimum of five percent reduction from the five-year baseline water use. In this case, the confirmed 2020 target is the five percent reduction from the five-year baseline.



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Table 3-3 Baselines and Targets Summary

Baselines and Targets Summary - Retail Agency or Regional Alliance Only					
Baseline Period	Start Year	End Year	Average Baseline GPCD*	2015 Interim Target	Confirmed 2020 Target*
10-15 year	1996	2005	130	123	116
5 Year	2004	2008	122		
*All values are in Gallons per Capita per Day (GPCD)					

Table 3.4 compares the City's 2015 water use target to its actual 2015 consumption. Based on this comparison, the City is following its 2015 interim target and has also already met the 2020 water use target.

Table 3-4 2015 Compliance

2015 Compliance Retail Agency or Regional Alliance Only		
Actual 2015 GPCD*	2015 Interim Target GPCD*	Did Supplier Achieve Targeted Reduction for 2015? Y/N
82	123	Yes
*All values are in Gallons per Capita per Day (GPCD)		

Per capita water use could decrease slightly because the population is anticipated to increase at a higher rate than new housing and the City continues to implement water conservation measures and programs. An increased population per household translates into less outside irrigation per person, which in turn would result in lower per-capita water use. Also, as general industry land uses shift to light industrial land uses, the demand for processing water will likely decrease; however, commercial landscaping irrigation will likely increase. Water conservation measures and programs include the distribution of water conservation kits and equipment, education programs at local schools and public presentations.

3.6 Quality of Water Supplies

As shown in the City of Santa Ana 2017 Consumer Confidence Report (**Appendix A**), the quality of the City's source water supplies is high. Therefore, the only water treatment the City performs is for disinfection. The City disinfects at each of its well sites through the injection of sodium hypochloride. Metropolitan's imported water has been disinfected by means of chloramination. A chlorine or chloramine residual of less than 0.5 milligram per liter (mg/l) is maintained in the distribution system.



SECTION 4 WASTEWATER CHARACTERISTICS AND FACILITIES

4.1 Wastewater Entities

The City operates and maintains the local sewer system consisting of over 390 miles of pipeline, 7,630 manholes, and two lift stations that connect to Orange County Sanitation District's (OCSD) trunk system to convey wastewater to OCSD's treatment plants. OCSD has an extensive system of gravity flow sewers, pump stations, and pressurized sewers. Collected wastewater is sent to OCSD's plants located in the Cities of Huntington Beach and Fountain Valley. OCSD's Reclamation Plant No. 1 in Fountain Valley has a capacity of 320 million gallons per day (MGD) and Plant No. 2 in Huntington Beach has a capacity of 312 MGD. Both plants share a common ocean outfall, but Plant No. 1 currently provides all of its secondary treated wastewater to OCWD's GAP and GWRS for beneficial reuse. The 120-inch diameter ocean outfall extends 4 miles off the coast of Huntington Beach. A 78-inch diameter emergency outfall also extends 1.3 miles off the coast.

The City joined the OCWD Joint Outfall System (JOS) in 1921 when it was formed. The Cities of Santa Ana and Anaheim agreed to construct an outfall extending into the Pacific Ocean. The JOS started construction in 1923 and the first sewage flow from the City was discharged into the system. The treated wastewater from OCWD Reclamation Plant No.1 is provided to wastewater to OCWD for both the GAP and GWRS which the GAP has been supplying recycled water to the City for over 25 years.

The City's primary source of recycled water is the OCSD's Reclamation Plant No. 1, located at 10844 Ellis Avenue in Fountain Valley. The OCSD Reclamation Plant No. 1 is also owned and operated by OCSD and GWP is owned and operated by OCWD. The GWP has complied with Title 22 requirements, the OCWD produces a tertiary treated effluent, which is stored in the Bear Street Reservoir owned and operated by OCWD.

4.2 Major Wastewater Facilities

The Orange County Sanitation District (OCSD) operates and maintains two treatment plants-- Reclamation Plant No. 1 and Treatment Plant No. 2, 552 miles of collection system sewers and 17 outlying pump stations. The treatment plants and pump stations are supervised, operated and maintained by highly trained professionals possessing the appropriate certification from the California State Water Resources Control Board for treatment plant operators, and the appropriate voluntary certification from the California Water Environment Association for maintenance staff. A process-flow diagram of the liquid and solids handling facilities at each treatment plant is shown in **Figure 4.1**.

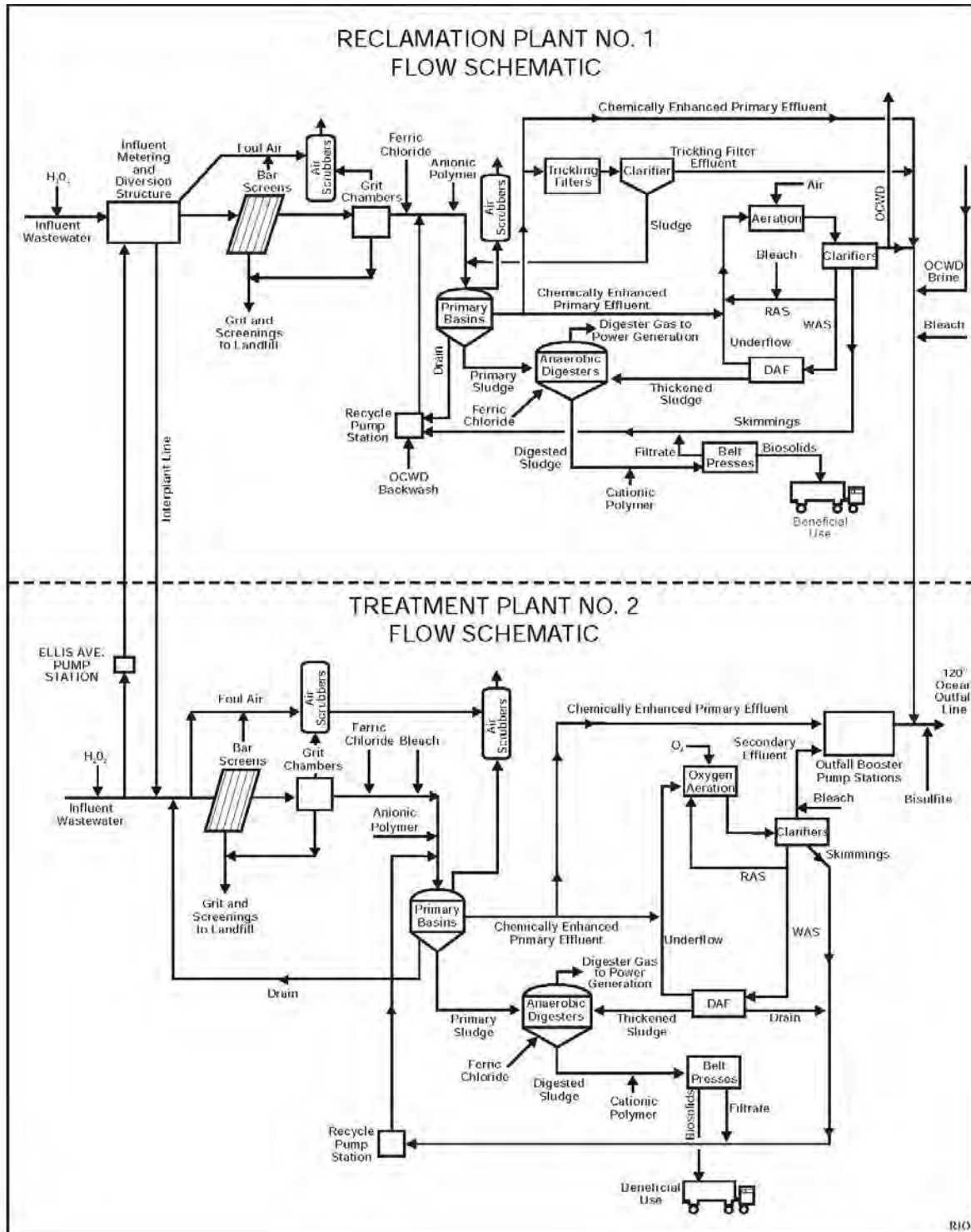
OCSD's Reclamation Plant No. 1 is located in the City of Fountain Valley. The metering and diversion structure, constructed in 1974, allows the wastewater from any of six sewers tributary to Plant No. 1 to be diverted to Plant No. 2 to match the incoming wastewater flow to the treatment capacity of Plant No. 1. The headworks contain pH meters, conductivity meters and flow meters to monitor the incoming wastewater on each trunk sewer. This operational flexibility also allows Plant No. 1 to provide the highest quality (lowest salt, lowest metal content) of wastewater for reclamation



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at the OCWD. Hydrogen peroxide is added to the plant influent to reduce the generation of hydrogen sulfide (H₂S) odors from the incoming trunk sewers.

Figure 4-1 OCSD Process Flow Diagram (Water and Solids) for Plants No. 1 and No. 2





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The wastewater flows through the bar screens where the large solids (e.g., rags, plastics and materials larger than ½ inch) are removed. In rare instances, debris such as construction lumber is captured by the screens. Wastewater is then pumped to an aerated grit chamber where the velocity of the water is slowed to allow coffee grounds, seeds, sand, gravel, and other heavy particulate debris to settle out. All the screenings and grit are hauled by contractors to a landfill for disposal. Foul air at the treatment plants is captured from the trunk sewers at the headworks buildings and grit chambers for treatment in the odor control chemical scrubbers.

To achieve chemically enhanced primary treatment (CEPT), ferric chloride and anionic polymer are added to the primary clarifiers to enhance the settling of the organic solids. The settled solids and floating particulates are pumped from the primary clarifiers to anaerobic digesters for stabilization. Each primary clarifier is covered to capture foul air for treatment in scrubbers. OCSD's Reclamation Plant No. 1 has a primary treatment capacity of 204 MGD.

During FY 2004/05, 81% of the Reclamation Plant No. 1 primary effluent received secondary (biological) treatment in the conventional air activated sludge (A.S.) secondary treatment process. Due to the Board of Director's decision on July 17, 2002, the A.S. secondary facilities operation has been increased from 30 MGD to the present 71 MGD. The trickling filters that had provided 20 MGD of secondary treatment were decommissioned on May 14, 2003 and a new 30 MGD trickling filter facility is scheduled for start-up in 2006. Approximately 8.4 MGD of the secondary treated water is pumped to OCWD's Water Factory 21 and the Green Acres Project for tertiary treatment. Tertiary treatment prepares the water for injection into the groundwater as a barrier against saltwater intrusion and for water reclamation and reuse. The balance of the Reclamation Plant No. 1 secondary effluent and the chemically enhanced primary treated effluent that has not undergone secondary treatment flows to Plant No. 2 where it is blended with treated wastewater from Plant No. 2 prior to ocean disposal. Plant No. 1 effluent is disinfected with bleach in the several-hour travel time to the Plant No.2 outfall booster station.

Solids collected in the primary and secondary clarifiers are pumped to anaerobic digesters for organic waste stabilization and pathogen destruction at 98°F. Stabilization results in the production of methane and carbon dioxide gas. The mix is called digester gas, a useable fuel. Digester gas is compressed and distributed to the Central Power Generation System (CGS) at each treatment plant as a fuel for energy generation.

At Reclamation Plant No. 1, natural gas and digester gas fuel the three internal combustion engines that power the 2,500 kilowatt (kW) electric generators. The FY 2004/05 Plant No. 1 electrical load averaged 6,190 kW. The air quality permits allow only two of the three engine generators to operate at one time, producing about 5,000 kW maximum. The engine generators produced an annual average of 4,840 kW and the remaining needed power was purchased from Southern California Edison.

OCWD GAP, the primary source of recycled water to the City, is located at 18700 Ward Street in the City of Fountain Valley.

4.2.1 Major Recycled Water Treatment Facilities

OCWD produces and distributes GAP water to local water retail agencies, which in turn sell the water to the customer. Businesses and residents of Orange County can purchase recycled water from their local water retailer. Check with



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your local water retailer about the possibility of connecting to the GAP distribution system and for available financial reimbursement programs to help offset capital investment.

Since 1991, the GAP has provided an alternate source of water to the cities of Costa Mesa, Fountain Valley, Huntington Beach, Newport Beach and Santa Ana. There are approximately 100 different sites currently using GAP water including: Mile Square Park and Golf Courses, Costa Mesa Country Club, Mount Olive Memorial Park, Centennial Park, Big Canyon Country Club, Newport Beach Country Club, Hyundai Motor America, Chroma Systems, IKEA, Kaiser Permanente, Plaza Tower, Caltrans, OC Performing Arts Center, South Coast Plaza, and OCSD. The total annual demand for GAP water in fiscal year 2016-17 was approximately 3,566 acre-feet (1.16 billion gallons), which equals 3.18 million gallons per day (MGD).

The GAP has a treatment plant design capacity of 7.5 MGD of recycled water. OCWD receives secondary treated wastewater effluent from the OCSD's Reclamation Plant No. 1 for use in both the Groundwater Replenishment System and the GAP system. For the GAP system, the OCSD flows are treated to a tertiary level (Title 22 of the California Code of Regulations) by mixing in coagulant, passing through flocculation paddles, filtration through dual-media beds (sand and anthracite), and finally spending time in a chlorine contact chamber before being discharged to a storage reservoir.

The GAP distribution system consists of two separate pump stations, two reservoirs with a combined storage capacity of 7.5 million gallons, approximately 37 miles of OCWD owned pipelines, a dedicated service pipeline to OCSD Plant #2, and an intertie pipeline to Irvine Ranch Water District's (IRWD) recycled water distribution system. Refer to **Figure 4.2** for a map of the GAP distribution system.



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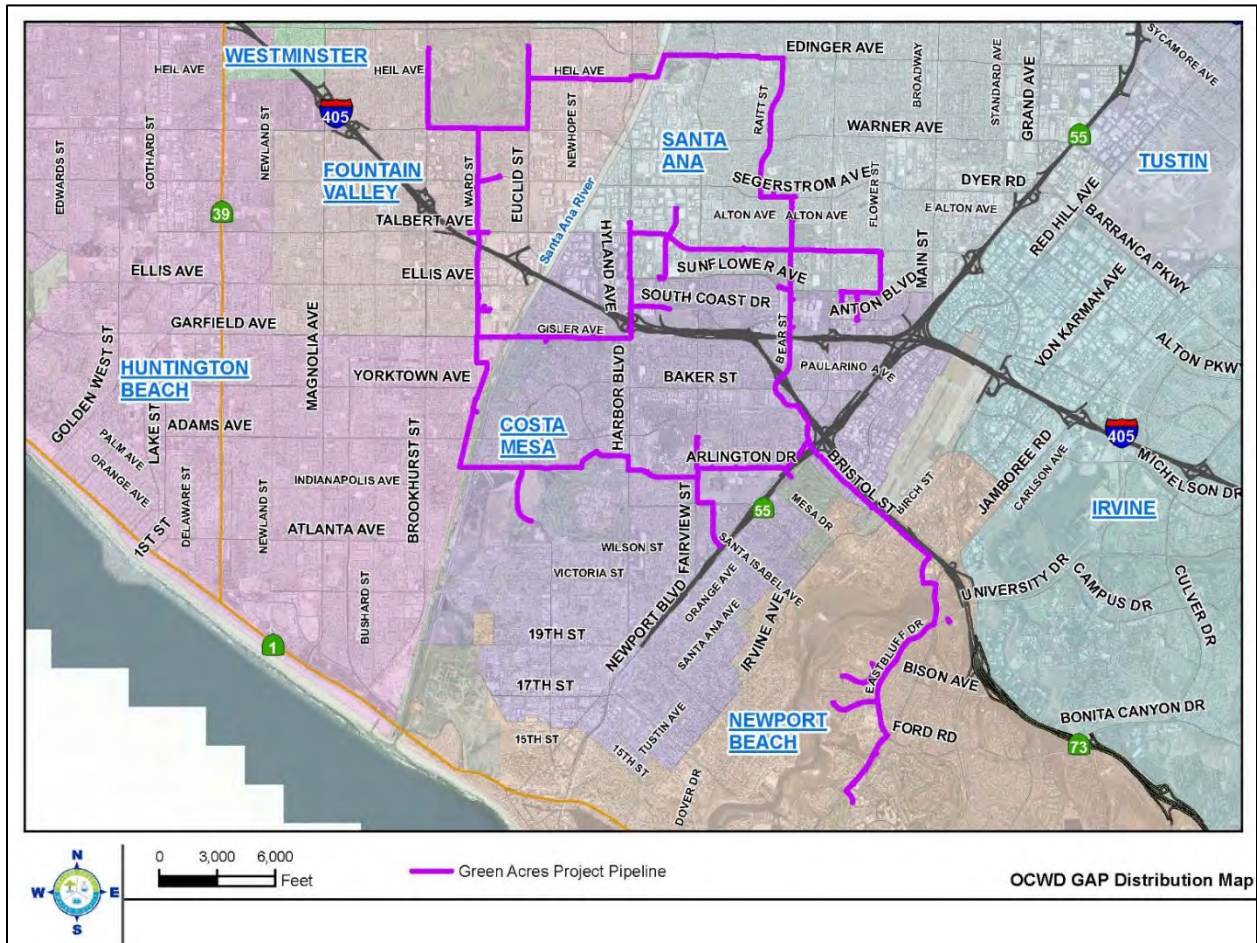


Figure 4-2 GAP Distribution System



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4.3 Water Quality of Effluent

The recycled water delivered to the City is in compliance with Title 22 requirements. The recycled water quality data of the GAP for calendar year 2017 is presented in Table 4-1..

Table 4-1 OCWD's Green Acres Project Water Quality from 2017

Abbreviation	Parameter Name	Units	Number of Analyses	Average RDL	Results			
					Minimum	Maximum	Average	Std. Dev.
Ag	Silver	ug/L	1	1	<1	<1	<1	
Al	Aluminum	ug/L	1	1	98.1	98.1	98.1	
APCOLR	Apparent Color (unfiltered)	UNITS	6	3	5	12	9.50	2.35
As	Arsenic	ug/L	1	1	<1	<1	<1	
B	Boron	mg/L	13	0.1	0.34	0.43	0.39	0.03
Ba	Barium	ug/L	1	1	32.3	32.3	32.3	
Be	Beryllium	ug/L	1	1	<1	<1	<1	
Br	Bromide	mg/L	3	0.1	<0.1	<0.1	<0.1	0.00
Ca	Calcium	mg/L	13	0.5	59.6	85.9	72.22	9.02
Cd	Cadmium	ug/L	1	1	<1	<1	<1	
Cl	Chloride	mg/L	13	0.5	251.0	307.0	278.00	17.76
CN	Cyanide	ug/L	1	5	<5	<5	<5	
Co	Cobalt	ug/L	4	1	<1	<1	<1	0.00
CODUNF	Unfiltered Chemical Oxygen Demand	mg/L	11	1	12	26	20.55	4.72
Cr	Chromium	ug/L	1	1	<1	<1	<1	
Cu	Copper	ug/L	1	1	1.9	1.9	1.9	
EC	Electrical Conductivity	um/cm	295	1	527	1,760	1,625.3	106.03
F	Fluoride	mg/L	1	0.1	0.88	0.88	0.88	
Fe	Iron	ug/L	4	5	101	197	132.75	44.29
HCO3	Bicarbonate (as HCO3)	mg/L	13	1.2	145.1	219.4	185.57	16.69
Hg	Mercury	ug/L	1	1	<1	<1	<1	
K	Potassium	mg/L	13	0.5	15.9	19.6	17.88	0.98
MBAS	Surfactants	mg/L	1	0.02	0.06	0.06	0.06	
Mg	Magnesium	mg/L	13	0.5	20.6	27.0	24.63	1.92
Mn	Manganese	ug/L	4	1	17.3	45.5	28.6	11.96
Na	Sodium	mg/L	13	0.5	196.0	237.0	219.85	13.41
NH3-N	Ammonia Nitrogen	mg/L	6	0.1	<0.1	<0.1	<0.1	0.00
Ni	Nickel	ug/L	1	1	3.5	3.5	3.5	
NO2-N	Nitrite Nitrogen	mg/L	6	0.00	<0.002	<0.002	<0.002	0.00
NO3-N	Nitrate Nitrogen	mg/L	6	0.1	9.91	14.60	11.94	1.66
ORG-N	Organic Nitrogen	mg/L	6	0.1	<0.1	0.30	0.11	0.12
Pb	Lead	ug/L	1	1	<1	<1	<1	
pH	pH	UNITS	294	1	7.1	8.4	7.43	0.13
PO4-P	Phosphate Phosphorus	mg/L	6	0.01	0.06	0.93	0.41	0.30
SAR	Sodium Adsorption Ratio	RATIO	11	0.1	5.0	6.3	5.74	0.39
SARADJ	Adjusted Sodium Adsorption Ratio	RATIO	11	0.1	8.8	12.7	11.50	1.20
Sb	Antimony	ug/L	1	1	<1	<1	<1	
Se	Selenium	ug/L	1	1	1.20	1.20	1.20	
SIO2	Silica	mg/L	1	1	18.6	18.6	18.6	
SO4	Sulfate	mg/L	6	0.5	160	205	182.33	18.01
TDS	Total Dissolved Solids	mg/L	13	1	912	1,050	970.00	48.04
TKN	Total Kjeldahl Nitrogen	mg/L	6	0.2	<0.2	0.30	0.10	0.12
Tl	Thallium	ug/L	1	1	<1	<1	<1	
TOC	Total Organic Carbon (Unfiltered)	mg/L	14	0.05	6.68	9.13	7.97	0.80
TOTALK	Total Alkalinity (as CaCO3)	mg/L	13	1	119.0	180.0	152.23	13.70
TOTHRD	Total Hardness (as CaCO3)	mg/L	13	1	252.0	320.0	281.77	21.64
TOT-N	Total Nitrogen	mg/L	7	0.2	10.2	14.6	11.76	1.58
Zn	Zinc	ug/L	1	1	16.8	16.8	16.8	



4.4 Additional Facilities

There are no additional facilities required for construction to comply with waste discharge requirements.

4.5 Sources of Industrial Constituents and Control Measures

OCSD Reclamation Plant No. 1 is the only the water reclamation plant operated by OCSD and treats municipal sewage for a population of approximately 2.0 million residences and commercial/industrial customers. There are no additional industrial constituents or control measures anticipated for OCSD before secondary effluent is provided to OCWD's to supply GAP and GWRS.

4.6 Existing Recycling

The City provides OCWD GAP recycled water to the southern part of the City. In FY 2014-15, approximately 352 AF of GAP water was used in the City's service area. The current users/uses of recycled water are as follows:

- Centennial Soccer Fields
- Bomo Koral Park
- Flower Street Bike Trail
- McFadden Intermediate School
- Adams Park
- Chroma Systems- Carpet Dyeing
- Chroma Systems- Landscape
- Kaiser Medical Office Landscape
- Chick-fil-A Landscape
- Santa Ana River Trail Landscape
- Godinez High School Landscape
- MacArthur Boulevard Median Landscape
- Bear Street Median Landscape
- Thornton Park
- Harbor Boulevard Median Landscape
- Santa Ana Valley High School Sports Complex Landscape

4.7 Existing Rights to use of Treated Effluent

The model public agency partnership between OCSD and OCWD began with Water Factory 21 (WF 21) in the mid-1970s. It was a world-renowned, and first-of-its-kind, water recycling facility that helped pave the way for many international projects and ultimately the Groundwater Replenishment System (GWRS). In the mid-1990s OCWD needed to expand WF 21 and address continued problems with seawater intrusion. At the same time, OCSD faced the challenge of having to build a second ocean outfall. The GWRS resolved these issues. Both agencies shared the cost of constructing the first phase of the GWRS (\$481 million US dollars). OCWD funded the initial expansion which cost \$142 million. OCSD supplied OCWD with stringently controlled, secondary treated wastewater at no charge. OCSD also invested resources to build a pump station to maximize wastewater flows to the GWRS. OCWD in turn agreed to



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manage and fund the GWRS operations. Through this collaboration, the GWRS emerged as one of the most celebrated civil engineering and water reuse projects in the world.

The cooperation between OCWD and OCSD was essential in designing and building the GWRS, which ensures north and central Orange County's water supplies remain reliable and safe. OCWD expanded the project from 70 million gallons (265,000 cubic meters) per day to 100 million gallons (379,000 cubic meters; 307 acre-feet) per day in mid-2015. The two agencies will undoubtedly continue to work together to make history in the world of water.

Based on an agreement between OCWD and OCSD, OCWD has the rights to all of the effluent from the OCSD's Reclamation Plant No. 1 at no cost to OCWD. The City has amended their recycled water agreement with OCWD which outlines the details of the recycled water usage, including rates and quantities. Refer to **Appendix F**.



SECTION 5 TREATMENT REQUIREMENTS FOR DISCHARGE AND REUSE

Production, discharge, distribution, and the use of recycled water are subject to federal, state, and local regulations, with the primary objective to protect public health. This section outlines the treatment requirements for discharge and reuse promulgated by these regulations.

5.1 Introduction to Requirements

Two federal acts regulate the discharge and use of recycled water:

- Clean Water Act (CWA) – contains federal requirements relevant to the discharge of recycled water, or wastewater, and any other liquid wastes to “navigable waters”. The US Environmental Protection Agency (USEPA) was created in conjunction with the development of the CWA. The National Pollutant Discharge Elimination System (NPDES) permit system was also established for the discharge of contaminants to navigable waters.
- Safe Drinking Water Act (SDWA) – contains federal requirements relative to the use of recycled water for groundwater recharge. The SDWA focuses on regulation of drinking water and control of public health risks by establishing and enforcing maximum contaminant levels (MCLs) for various compounds in drinking water. The SDWA also established requirements for protection of groundwater supplies through wellhead protection programs and regulation of underground injection of wastes.

State requirements for production, discharge, distribution, and use of recycled water include:

- California Health and Safety Code, Chapter 5, Article 2, Sections 116800-116820 – Cross-Connection Control by Water Users (Health and Safety Code)
- California Water Code, Division 7 – Water Quality, Section 13050-13583, 13627, 14875-14877.3 (Water Code)
- California Code of Regulations, Title 17 – Public Health, Chapter 5, Subchapter 1, Group 4 – Drinking Water Supplies, Sections 7583 through 7605 (Title 17)
- California Code of Regulations, Title 22 – Social Security, Division 4 – Environmental Health, Chapter 3 – Water Recycling Criteria, Section 60301 through 60355 (Title 22)

The State Water Resources Control Board Division of Drinking Water (SWRCB DDW) formally California Department of Public Health (CDPH) has published the *Statutes Related to Recycled Water June 2014*, which includes excerpts from the Health and Safety Code and the Water Code, as well as Regulations Related to Recycled Water June 2014, which includes excerpts from Title 17 and Title 22. These two documents are included together as **Appendix B**, respectively. SWRCB DDW has also posted draft revisions to the cross-connection regulation found in Title 17.

5.2 Required Water Quality for Potential Uses

The OCWD’s GAP, the primary source of recycled water for the City, produces a tertiary treated effluent categorized as “Disinfected Tertiary Recycled Water,” per Title 22, which meets the following definition:



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- According to Title 22, Section 60301.230, "Disinfected tertiary recycled water" means a filtered and subsequently disinfected wastewater that meets the following criteria:
 - A. The filter wastewater has been disinfected by either:
 - (1) 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
 - (2) 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 in the wastewater. A virus that is at least as resistant to disinfection as polio virus may be used for purposes of the demonstration.
 - B. The median concentration of total coliform bacteria measured in the disinfected effluent does not exceed an MPN of 2.2 per 100 milliliters 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 milliliters in more than one sample in any 30-day period. No sample shall exceed an MPN of 240 total coliform bacteria per 100 milliliters.

- According to Title 22, Section 60301.320, "Filtered wastewater" means an oxidized wastewater that meets the criteria in either one of the following:
 - A. Has been coagulated and passed through natural undisturbed soils or a bed of filter media pursuant to the following:
 - (1) At a rate that does not exceed 5 gallons per minute per square foot of surface area in mono, dual or mixed media gravity, upflow or pressure filtration systems, or does not exceed 2 gallons per minute per square foot of surface area in traveling bridge automatic backwash filters; and
 - (2) So that the turbidity of the filtered wastewater does not exceed any of the following:
 - a) An average of 2 NTU within a 24-hour period;
 - b) 5 NTU more than 5 percent of the time within a 24-hour period; and
 - c) 10 NTU at any time.
 - B. Has been passed through a microfiltration, ultrafiltration, nanofiltration, or reverse osmosis membrane so that the turbidity of the filtered wastewater does not exceed any of the following:
 - (1) 0.2 NTU more than 5 percent of the time within a 24-hour period; and
 - (2) 0.5 NTU at any time.

5.3 Required Health-Related Water Quality or Treatment Requirements for Potential Uses

In order to protect public health from risks associated with potential cross-connection and subsequent contamination of potable water systems, the City will need to implement backflow protection measures at new recycled water sites where recycled water is to be used, in accordance with Title 17 and the Health and Safety Code.



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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. The type of protective device that may be required (listed in an increasing level of protection) includes: Double Check Valve Assembly, Reduced Pressure Principle Backflow Prevention Device and an Air Gap Separation.

The City may choose a higher level of protection than required. The minimum types of backflow protection devices required to protect the public water supply at the City's connection to recycled water are shown in **Table 5-1** Minimum Backflow Prevention Device Required by CCR Title 17. Situations that are not covered will be evaluated on a case-by-case basis and the appropriate backflow protection shall be determined by the water supplier or health agency.

The backflow preventive devices are defined in Title 17 as follows:

- Air-gap separation – “a physical break between the supply line and a receiving vessel”
- Reduced pressure principle backflow prevention device – “a backflow preventer incorporating not less than two check valves, an automatically operated differential relief valve located between the two check valves, a tightly closing shut-off valve on each side of the check valve assembly, and equipped with necessary test cocks for testing”
- Double check valve assembly – “an assembly of at least two independently acting check valves including tightly closing shut-off valves on each side of the check valve assembly and test cocks available for testing the water-tightness of each check valve”

Table 5-1 Minimum Backflow Prevention Device Required by CCR Title 17

Situation	Description	Minimum Type of Backflow Preventive Device
1	Premises where the public water system is used to supplement the recycled water supply.	Air-gap Separation
2	Premises where recycled water is used, other than as allowed in paragraph (3), and there is no interconnection with the water system.	Reduced Pressure Principle Backflow Prevention Device
3	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 a approval of the local public water supplier, or the Department if the water supplier is also the supplier of the recycled water, to utilize an alternative backflow protection plan that includes an annual inspection and annual shutdown test of the recycled water and potable water systems pursuant to subsection 60316(a).	Double Check Valve Assembly

5.4 Wastewater Discharge Requirement

The use of recycled water from OCWD's GAP is permitted under Regional Watery Quality Control Board (RWQCB) – Santa Ana Region Order No. 97-072 for direct and non-potable reuse. A copy of the order is included in **Appendix C**.



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The State Water Resources Control Board (SWRCB) adopted General Waste Discharge Requirements for Landscape Irrigation Uses of Municipal Recycled Water (General Permit), which is included in **Appendix D**. Since most of the recycled water usage will be for landscape irrigation the City could submit a complete Notice of Intent (NOI) form, Operations and Maintenance Plan, and appropriate application fee to the SWRCB to obtain coverage under the General Permit. The General Permit employs a minimum treatment standard of disinfected tertiary recycled water, as well as exposure control measures that include minimum setback distances, signage, method of application and use restrictions.

The RWQCB adopted a Non-Irrigation General Water Reuse Order (General Order) in 2009 for the following uses of recycled water:

- Industrial boiler feed
- Nonstructural fire fighting
- Backfill consolidation around non-potable piping
- Soil compaction and mixing concrete
- Dust control on roads and streets
- Cleaning roads and outdoor work areas
- Industrial process water that will not come into contact with workers

The City could submit a complete NOI form to RWQCB to obtain coverage under the General Order for non-irrigation uses. A copy of the order is included in **Appendix E**.

5.5 Water Quality-Related Requirements of the RWQCB

The General Permit establishes terms and conditions of discharge to ensure that the discharge does not unreasonably affect present and anticipated beneficial uses of groundwater and surface water. RWQCB also states in the General Order that the specified uses of recycled water present a low risk to the beneficial uses of groundwater when they meet Title 22 requirements and are applied in a manner where runoff to surface waters or saturation of underlying soils does not occur.



SECTION 6 RECYCLED WATER MARKET

The City of Santa Ana currently serves potable water to industrial and irrigation customers within the City limits. This section outlines the market assessment procedures, the potential users, and the logical service area based on the market assessment.

6.1 Market Assessment Procedures

The recycled water market analysis conducted for this study is based on available consumption data (monthly billing records from 2014, 2015, and 2016) from the City's 43,000 potable water customers, including all potable irrigation customers.

6.2 User Types and Potential Recycled Water Use

The City has twenty-six (26) customer classifications as shown in **Table 6-1** and highlighted in yellow. A recycled water potential use percentage was assigned to each user category based on prior experience with recycled water conversions by the TRHA team, and the types of domestic water use. In order to be considered for conversion, the individual customer demand would have to be at least the amounts shown in **Table 6-1**. BU/yr. are billing units per year where one billing unit is equal to 748 gallons. The highlighted entries in **Table 6-1** are those customer classifications used by the City of Santa Ana.



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Table 6-1 Customer Types and Required Demand for Conversion

Type No.	User Type	Potential RW Use	Required DW Demand BU/yr.	Type No.	User Type	Potential RW Use	Required DW Demand BU/yr.
1	Agricultural	95%	1,800	33	Irrigation	100%	1,700
2	Apartments - 4 or more	40%	4,300	34	Laundromat - Commercial	90%	1,900
3	Apartments w/Dumpster	40%	4,300	35	Landscape	100%	1,700
4	Automobile Dealer	80%	2,200	36	Laundromat - General	10%	17,000
5	Bank	85%	2,000	37	Manufacturing	60%	2,900
6	Car Wash	90%	1,900	38	Medical	50%	3,400
7	Cemetery	95%	1,800	39	Metal Finishing	50%	3,400
8	Church	85%	2,000	40	Metal Plating	50%	3,400
9	City (Government)	90%	1,900	41	Mobile Home	40%	4,300
10	City Irrigation	100%	1,700	42	Multi-store Retail	50%	3,400
11	City Owned Property	90%	1,900	43	Nursery	95%	1,800
12	City Park	90%	1,900	44	Nursing Home	50%	3,400
13	Commercial Property	50%	3,400	45	Office	90%	1,900
14	Commercial w/Dumpster	50%	3,400	46	Paper Recycle	95%	1,800
15	Construction	50%	3,400	47	Post Office	85%	2,000
16	County	90%	1,900	48	Power Plant	90%	1,900
17	Day Care	50%	3,400	49	Property Mgt	85%	2,000
18	Dry Cleaner	20%	8,500	50	Recharge	100%	1,700
19	Duplex Dwelling	40%	4,300	51	Reclaimed Water	N/A	
20	Duplex Dwelling w/Dumpster	40%	4,300	52	Restaurant	5%	34,000
21	Fabric Dyeing	95%	1,800	53	Retail	50%	3,400
22	Fireline Only	N/A		54	School	75%	2,300
23	Food Establishment	5%	34,000	55	Single Family Dwelling	40%	4,300
24	Food Process	5%	34,000	56	Single Family Dwelling w/Dumpster	40%	4,300
25	Gas Station	20%	8,500	57	Single Family Expt Sani	40%	4,300
26	Golf Course	95%	1,800	58	Storage	90%	1,900
27	Government	90%	1,900	59	Supermarket	50%	3,400
28	Health Club	85%	2,000	60	Theater	90%	1,900
29	HOA	70%	2,500	61	Triplex Dwelling	40%	4,300
30	Hospital	20%	8,500	62	Triplex Dwelling w/Dumpster	40%	4,300
31	Hotel/Motel	20%	8,500	63	Warehouse	50%	3,400
32	Industrial w/Dumpster	50%	3,400	64	Water Only - Outside City	N/A	
				65	Water Purification	90%	1,900
				66	Wholesale Food	50%	3,400

Note: All values rounded up to nearest 100 BU, and 10-year payback of conversion and O&M costs.



6.2.1 Potential Use by Customer

By applying the recycled water potential use percentage to each customer's total annual usage, an estimated potential demand for each user was developed. Only those customers which met the screening threshold were included in the list of potential users.

6.2.2 Financial Evaluation Criteria

In order to perform a financial evaluation of each customer to determine if it is financially feasible to convert that customer's domestic water demand to recycled water, TRHA developed a demand threshold for each user type based on the cost criteria shown in **Table 6-2**. By combining the percent of domestic water potentially convertible to recycled water with the financial screening information a final screening table was developed for each user type. In order to be considered a viable conversion candidate the customer's demand would have to be equal to or greater than the quantities shown in **Table 6-2**. During the analysis it was assumed that the City would provide a financial incentive to customers to convert to recycled water. A 10% discount on the potable water rates was assumed to offset onsite retrofit costs by the customer. TRHA identified a total of 448 potential retrofit sites as shown in **Exhibit 1**.



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Table 6-2 Conversion Cost Payback Analysis

Required Demand Based on assumption that City would pay for onsite conversion costs and accept a 10-year payback.

1 BU 100 CF 748 gallons Rate Differential DW vs RW \$ 0.25 per BU

Conversion cost

Site Conversion	\$ 5,000	
New RPPD (2-inch)	\$ 3,500	
Backflow testing for 10 years	\$ 500	(assumed \$50.00/test/year) (assumed 3 inspections)
Site Inspection (every 4 years)	\$ 4,500	
10-yr Cost per Site (estimated)	\$ 13,500	

At \$0.80 per BU savings applied to conversion cost: \$ 16,875 BU of potable conversion needed
Over 10 years 1,688 BU per year

Existing PW rate =	Tier 1 (0-44 HCF or BU)	\$ 2.83	per BU
	Tier 2 (>45 HCF or BU)	\$ 3.40	per BU

Reclaimed Water rate = \$ 2.26 per BU

Assuming all RW will offset Tier 2 demand \$ 1.14 per BU savings

Assuming a 10% discount on potable rates to fund onsite conversions \$ 0.80 per BU savings

Rates per City of Santa Ana Final Rate Study, Rate Study, Rehabilitation/Replacement Program and prepared by Black and Veatch November 18, 2014, Table 23 - Proposed Rates for Scenario 1 - FY 16/17 through FY 18/19

Percent Use = Percentage of current consumption that may be converted to recycled water.



6.2.3 City Irrigation Meters

Because of the continuing drought in California, most of the City's irrigation meters were turned off to conserve water. Therefore, in the modeling of the proposed system TRHA assumed that the irrigation demands from FY2014/15 would return when recycled water was made available.

6.3 Potential Recycled Water Use

Exhibit 1 of this report presents a summary of potential recycled water customers identified in the market assessment. Among the original 43,000 customers at the start of the analysis, 448 customers were estimated to be potential customers. The potential customers are primarily irrigation, but also include some industrial/commercial users. Landscape irrigation is the most common use for recycled water. Parks, educational facilities, and other green spaces within the City are described in the following subsections.

6.3.1 Park and Median Irrigation

Thirty-three park and fifty-four greenbelt irrigation meters classified as City Irrigation were identified as potential conversion candidates with a total annual demand of 278.22 acre-ft/yr. These include: Centennial Park, Lillie King Park, Paseo Park, Sandpointe Park, Thornton Park, Birch Park, Flower Street Park, Morrison Park, Sasscer Park, Cabrillo Park, Delhi Park, Mabury Park, Portola Park, Prentice Park, Santiago Park, Campensino Park, Heritage Park, and Rosita Park. In addition, irrigation for Caltrans, medians, and the Santa Ana Zoo were included in this classification.

6.3.2 School Irrigation

A total of forty-three school irrigation meters were identified as potential conversions with a total annual demand of 124.45 acre-ft/yr. This included Rancho Santiago Community College, Santa Ana High School, middle schools, elementary schools, and private schools such as Newsong Community Church and Westport School.

6.3.3 Residential

No residential customers have been identified as potential recycled water customers. No individual customer's domestic water demand could yield enough potential recycled water demand based on the screening criteria.

6.3.4 Commercial/Industrial Facilities Irrigation

The commercial and industrial potential customers included twelve industrial customers with a total of 329.79 acre-ft/yr. of potential demand. The largest potential industrial customer is Chroma Systems (171.70 acre-ft/yr.). The commercial customers which could be converted included forty connections with a total annual demand of 312.70 acre-ft/yr. Power Circuits, Inc. is the largest potential commercial connection at 171.70 acre-ft/yr.

Potential medical facilities included Western Medical with a potential 3.91 acre-ft/yr. Two Mobile Home Parks, Lake Park Santa Ana and Park Terrace Mobile Home Park, were identified with a combined potential demand of 10.25 acre-ft/yr. Two Multistory Retail connections were identified including Brookhollow Office Park and Main Place Shopping



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Center with a total potential of 12.24 acre-ft/yr. Finally, Wholesale Food contained three potential use sites with a combined annual demand of 151.72 acre-t/yr.

6.3.5 Apartments with Dumpsters

Screening of the potential recycled water users identified 53 apartments with dumpsters which have enough demand to justify considering a recycled water retrofit. This group of potential users could use 661.46 acre-ft/yr. of recycled water. It is assumed that 40 percent of these facilities' potable water use will be offset by recycled water, primarily for irrigation.

6.3.6 City Irrigation

Screening of the potential recycled water users identified 54 City irrigation meters that could be connected to a recycled water pipeline. As a result of the recent years of drought these meters were shutdown. It is expected that when recycled water is available these meters would be re-activated with a total potential of 34.03 acre-ft/yr. based on historic use patterns from FY2014/15.

6.3.7 Government and City Property

Twenty-eight Government properties and fifteen City properties were identified as potential candidate sites with a combined annual demand of 279.72 acre-ft/yr. The largest users were the County of Orange (Government) and the Santa Ana Police Station (City Property).

6.3.8 Existing Irrigation Meters

It was assumed in the modeling of the system that all meters currently designated as "Irrigation" would be converted to recycled. Because the onsite systems are already separate from the domestic water supplies, the process of converting the site would be minimal. There are currently 160 connections designated as Irrigation with a total potential demand of 797.28 acre-ft/yr.

6.4 Logical Service Area

Based on the market assessment conducted as a part of the Study, the City has identified areas for the recycled water distribution system primarily:

- along MacArthur Blvd. and Flower Street for Phase 1 User;
- along Fairview, 1st, and Bristol for Phase 2 Users;
- along Grand Avenue for Phase 3 Users; and,
- along Harbor Blvd. for Phase 4 Users.

These final alignments would be subject to further analysis for constructability and coordination with other City projects.



6.5 On-Site Conversions

The new recycled water distribution system will only bring recycled water to the site via a new meter box to the recycled water customer. The site needs to be retrofitted to use recycled water then tested for cross-connections while simultaneously utilizing the potable system. Recycled water will be delivered after the on-site retrofit is completed, cross connections have been performed and County of Orange, Department of Public Health approves. On-site recycled retrofit includes the following components:

- Prepare an Industrial Engineering Report (IER) for industrial customers or retrofit drawings for all customers – approved by State of California Department of Public Health (IER only), Orange County Department of Public Health (retrofit drawings), and/or Division of State Architect (schools retrofits only);
- Perform preliminary cross connection testing to identify cross-connections and remove any improper connections;
- Install Orange County Department of Public Health approved backflow prevention assemblies and have the system tested by a certified tester;
- Identify all components that will be converted to recycled water, install labels and warning signs as appropriate;
- Perform final cross-connection test;
- Install recycled water meter; and
- Perform overspray inspection for irrigation services.



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SECTION 7 PROJECT ALTERNATIVE ANALYSIS

Design criteria and basic cost data presented in this study apply to concept level layout of major recycled water supply and distribution components. For planning purposes, an approximation of size, location, route and cost have been developed to compare alternatives on a consistent basis. Relocation and resizing of facilities may be required at a later date if detailed engineering design and construction are performed for any alternative. In that instance and costs will change accordingly. The conceptual costs presented here are for comparison purposes only.

Facility sizing is based on the average annual irrigation demands determined in previous sections for specific areas in the City's service area. An effort has been made to use existing recycled water pipelines to provide certain areas with recycled water that are near existing systems.

Recycled water source, delivery and treatment alternatives were evaluated and ranked to prioritize the alternatives developed. Section 7.6 provides the prioritization criteria and framework

7.1 Planning and Design Assumptions

The design criteria utilized for the pipeline sizing, summarized in Table 7-1 Pipeline Sizing and Evaluation Criteria, are similar to the OCWD's GAP recycled water system, since the City's system will be connected to OCWD's system.

Table 7-1 Pipeline Sizing and Evaluation Criteria

Item	Criteria
Pipeline Sizing Conditions	Peak hour demand (PHD) – for pipelines where irrigation demands govern
Maximum Pipeline Velocity	5 ft/sec under PHD conditions
Head loss	< 5 ft/1,000 feet preferred under PHD conditions (Head loss by itself does not govern pipeline sizing but is used as sizing indicator. Pressure and velocity govern pipeline sizing.)
Friction Factor	Refer to Technical Memorandum #2 – Hydraulic Model Development Best Practices by ID Modeling dated May 2014
Maximum Pressure	100 psi 150 psi (preferred)
Delivery Pressure	Refer to May 2014 Technical Memorandum #7 – Final technical Memorandum by ID Modeling dated August 2015

7.1.1 Pipeline Sizing

Pipeline sizing is based on a combination of the following factors:

- Demand conditions



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- Pipeline velocity
- Pipeline head loss
- System pressures
- Future phase Implementation

Since most of the potential customers would be using the recycled water to satisfy irrigation demands, the pipeline sizes are governed by PHD conditions due to the effect of night time demand for irrigation. Peaking factors used to calculate various demand conditions are similar to the ones used for OCWD's GAP recycled water distribution system. The peaking factors for irrigation and industrial uses are 5.75 and 1.65 respectively. Pipelines are also sized based on a maximum velocity of 6 ft/sec occurring during PHD conditions. A pipeline segment would be upsized to the next standard size if the pipeline velocity exceeded the velocity criterion under the governing demand condition. Planned pipeline diameters are 4-inch, 6-inch, 8-inch, 10-inch, 12-inch and 16-inch.

Pressure governs pipeline sizing; however, head loss is factored into the selection, as it is used as a sizing indicator. A maximum head loss of 6 ft/1,000 feet is preferred under PHD conditions.

7.1.2 Delivery and System Pressure

The minimum system pressure for irrigation and industrial customers is 40 psi; however, in some cases, it will not be possible to deliver a minimum of 40 psi without additional infrastructure. In cases where pressures will be less than 40 psi, a booster pump will be required at the customer's service connection. It is recommended that pipeline pressures do not exceed 150 psi where possible to avoid the need for high-pressure class piping and appurtenances. In cases where pressures will be more than 100 psi, a pressure relief valve will be required at the customer's service connection.

7.1.3 Storage Criteria

In order to maintain supply reliability, the installation of a storage facility is recommended. The four (4) reservoir locations (one for Phase 2, one for Phase 3 when supplied from Irvine Ranch Water District, and two for Phase 4 and all are small reservoirs with a combined storage volume of 200,000 gallons. The proposed storage reservoir due to the following factors:

- Vacant land space
- Land surface elevation
- Central location within the proposed system
-

The storage reservoirs will intake recycled water during off-peak use time to take advantage of supply availability and provide reliability during peak use times. AWWA M-32 does not apply since recycled water is not a drinking water system.



7.1.4 Pump Stations

Where some irrigation sites are at much higher elevations than their supply source, pump stations are required to increase water pressure to those use sites. As the demands are minimal in the City's service area, the pump stations will be small and located below-grade. No standby power is assumed due to small user demands.

7.1.5 Hydraulic Modeling

TRHA utilized KYPIPE to model the recycled water distribution system alternatives. Because the recycled water will be replacing existing potable water supplies, the hydraulic criteria used in the modeling matched the potable water service criteria. The results of the hydraulic modeling are contained in **Appendix I**.

7.1.6 Cost Basis and Planning Period

The cost for the proposed project is presented in this section. A Class 5 opinion of probable construction costs (i.e., a conceptual level estimate) is provided for the recommended projects based on very limited available information. According to the Association for the Advancement of Cost Engineering (AACE):

"Class 5 estimates are generally prepared based on very limited information, and subsequently have wide accuracy ranges. Typically, engineering is from 2% to 10% complete. They are often prepared for strategic planning purposes, market studies, assessment of viability, project location studies, and long-range capital planning. Virtually all Class 5 estimates use stochastic estimating methods such as cost curves, capacity factors, and other parametric techniques. Expected accuracy ranges are from -20% to -50% on the low side and +30% to 100% on the high side, depending on technological complexity of the project, appropriate reference information, and the inclusion of an appropriate contingency determination. Ranges could exceed those shown in unusual circumstances."

A planning period of 25 years was used for the economic cost analysis.

7.2 Water Recycling Alternatives to be Evaluated

Project cost is the total capital investment necessary to complete a project, including costs for land acquisition, all necessary engineering services, construction, contingencies, and overhead items such as legal and administrative services, and financing. Concept level costs developed in this study include 30 percent construction contingency and 20 percent implementation costs which include overhead items. Components of project costs are described in further detail below.

7.2.1 Treatment Alternatives

The City only has two sources of water (potable water and groundwater) and do not own the sanitary sewer flows so alternative treatment such as a satellite treatment plant are not feasible. In addition, alternative levels of treatment on the recycled water is not necessary since OCWD provided fully treated Title 22 water currently to the City and would continue via their GAP or GWRS system.



7.2.2 Land Acquisition

In most cases, construction of proposed recycled water distribution system improvements should not require purchases of privately-owned land. Pipeline routes typically follow existing public streets and roads, except in a few instances where an easement would be required. Land acquisition costs are included as part of contingency and implementation costs.

A scalping plant would require purchase of land which has not been considered because locating a treatment plant within the city would be challenging due to lack of available space, odor and aesthetics.

7.2.3 Construction Costs

Concept level costs include materials, labor and services necessary to construct the project. The costs are derived from current cost information and past project experience and are intended to represent conditions expected in Santa Ana. Cost estimating guides, previous studies, cost curves, and recent local contract bids were used to develop cost information for scalping plants, pipelines, pump stations, storage facilities, and stormwater capture with groundwater recovery.

7.2.3.1 Cost Index and Price Escalation

Construction costs typically undergo long-term changes in keeping with corresponding changes in the regional and national economy. A commonly accepted barometer of these changes is Engineering News- Record's (ENR) Construction Cost Index (CCI) that is computed from prices of construction materials and labor and based on a value of 100 in the year 1913. Project costs in this study are based on an ENR CCI of 10,092 from November 2017.

7.2.3.2 Pipelines

Costs for recycled water pipelines include trenching, placing and jointing pipe, installing valves and fittings, placing imported initial backfill, placing native material for subsequent backfill, pavement replacement, and testing. For pipe located within major roads and highways a higher unit cost was considered but a uniform unit cost was assumed to include all the necessary items including traffic control and utility conflicts are expected. Cost for pipeline construction was estimated at \$15 per inch-diameter foot.

7.2.3.3 Pump Stations

Pumping station costs vary considerably depending on factors such as architectural design, pump type, driver type, pumping head, need for standby power, and station capacity. Pump station costs were determined from Pumping Station Design (Jones, et al. 2008) construction cost curves for booster pump stations shown on **Figure 7.1**. The higher curve was used to determine the costs for a particular capacity as the pump stations are small and are assumed to be constructed below grade. Costs for pump, motors, minimal site piping and appurtenances, instrumentation and electrical controls are included. The cost of the pump station was updated for the current ENR CCI value. Small packaged pump stations with capacities smaller than that shown on the pumping station curves were assumed to cost \$30,000 to \$50,000 and would be below grade.

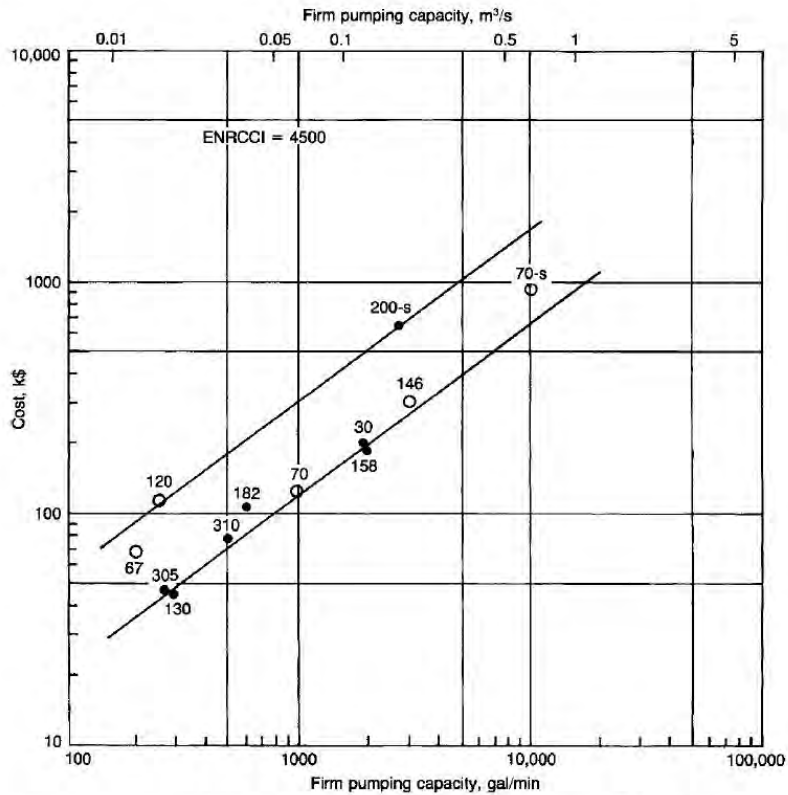


Figure 29-7. Construction costs of booster pumping stations. In-line booster = solid circles; residential booster = open circles; standby power = -s. The numbers are TDH in feet.

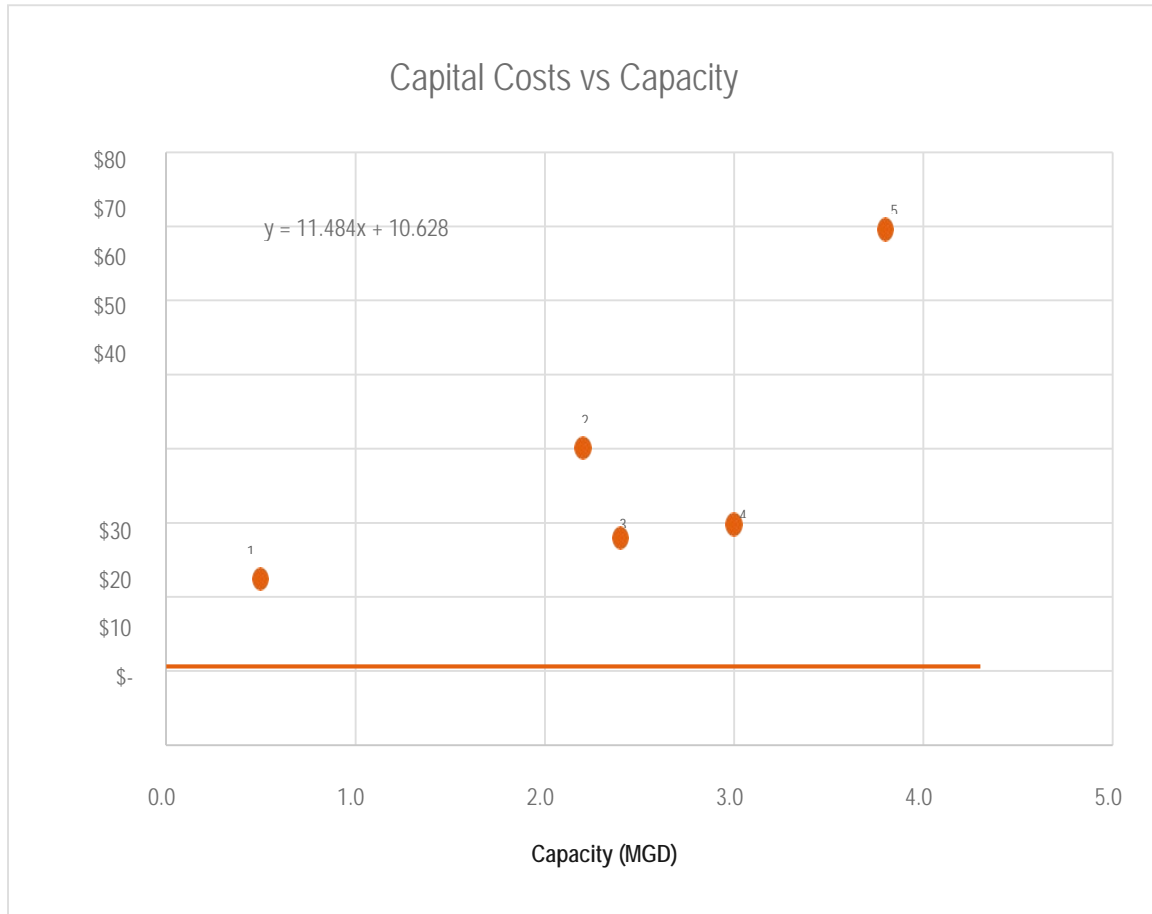
Figure 7-1 Pump Station Capital Cost vs. Capacity (Jones et al 2008)

7.2.3.4 Scalping Plants

Costs for scalping plants were determined by plotting data from previous bids in Los Angeles County. Figure 7.2 shows bid costs for scalping plants with a capacity of 1 to 3.5 MGD. The bid costs have been adjusted to the current Engineering News Record (ENR) Construction Cost Index (CCI). From this graph and equation, capital costs for scalping plants of specific capacities were able to be determined.



Figure 7-2 Scalping Plant Capital Costs vs. Capacity



1. Piru WWTP; Piru, CA; 2008; MBR Estimate; 0.5 MGD
2. Hollywood Satellite; Hollywood, CA; 2012 Concept Estimate; 2.2 MGD
3. Hollywood Raw Wastewater Plant; Hollywood, CA; 2010 Concept Estimate; 1.2 MGD
4. San Fernando Valley-Southeast (CA); 2010 Concept Estimate; 1.5 MGD
5. Southeast Satellite; Los Angeles, CA; 2012 Concept Estimate; 3.8 MGD

7.2.3.5 Storage Facilities

Costs for reservoir conversion from potable to non-potable use are typically minimal and were assumed to be \$10 per gallon of reservoir volume. This is assumed to include on-site piping changes, valves, hydraulic testing, and cross-connection testing.



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7.2.3.6 Recycled Water from Neighboring Agency

Costs associated with purchasing recycled water from a neighboring agency were determined based on conversations with each district and values listed in reports or recycled water master plans as shown below.

IRWD

IRWD's recycled water base rate for non-agricultural landscape irrigation is \$597 per AF. However, the rate structure is tiered, and the "inefficient" tier is billed at \$662 per AF. To account for escalation until project start and the tier structure, an estimated purchase cost of \$700 per AF was assumed. IRWD's current base retail rate for potable water is \$705 per AF.

7.2.3.7 Onsite Conversion Costs

Onsite conversions are required when serving both potable and recycled water to the same customer. Conversions include isolating the irrigation system from the potable water source, installing new backflow assemblies, cross connection testing, personnel notification and signage. Recent conversion costs have ranged between \$5,000 to \$7,500 (the higher number for projects funded by Proposition 84 that requires prevailing labor rates) per site. Due to the relatively small site conversions required, \$5,000 was assumed for all customer which includes City facilities, commercial and others.

7.2.3.8 Environmental

For major projects such as a scalping plant, a full environmental impact report would be required. Depending on where it is located, and funding sources, the document may need to comply with both state and federal requirements at a cost of several hundred thousand dollars. Environmental studies may also be required for pipelines that do not follow existing roads and would, at a minimum, consist of an Initial Study and Mitigated Negative Declaration (MND). The cost for alternatives that require minimal environmental work such as pipelines in existing rights-of-way were estimated at \$50,000.

7.2.3.9 Construction Contingencies

A contingency allowance covers uncertainties associated with preliminary planning. Factors such as special construction methods, variation in final lengths or average depths of pipelines, and construction adjacent to existing facilities are a few factors that can increase construction costs. A construction contingency provides an allowance in conceptual design cost opinions. The cost of these services can vary greatly depending on the type and magnitude of the project. An allowance of 30 percent of the total construction cost has been assumed to cover any contingencies.

7.2.3.10 Implementation Costs (Engineering and Administration)

The cost of engineering services for major construction projects includes some or all of the following: special investigations, preliminary design reports, surveys, geotechnical studies, locating interfering utilities, detailed design, preparing contract documents, construction inspection, office engineering, materials testing, final inspection, and start-up of the completed project.



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Administration charges are assumed to cover items such as legal fees, financing expenses, administrative costs and interest during construction. The combined engineering services and administrative costs assumed was 20 percent of the construction cost of each alternative.

7.2.3.11 Annual Costs

Annual costs for O&M are projected based on labor and materials, and typical power costs estimated at \$15 per AF per 100 feet of total dynamic head (TDH). Unit costs for non-power expenditures based on past projects include the following:

- Pipeline, fixed annual O&M cost equal to 0.5 percent of the pipeline cost estimate
- Pump Station, non-power O&M cost equal to \$24.00 per AF
- Storage, fixed annual O&M cost of 0.1 percent of the reservoir cost estimate

7.2.3.12 Life Cycle Cost Evaluation

Alternatives are compared on a dollars per AF basis in order to assess financial feasibility against the cost of imported water or other potential water supplies. These life cycle costs assess the commodity cost of non-potable water but do not quantify project benefits or avoided costs. In order to determine the cost per AF for each alternative, the capital cost was annualized using a discount rate of three percent over 25 years. The annual recurring costs and the annualized capital cost were combined and divided by the AAD of that alternative to determine the cost per AF for comparison to the cost of imported water.

7.2.3.13 Construction Issues

The City of Santa Ana has various construction constraints due to the geography and residents of the City including:

- To protect residents' views all new water storage reservoirs are required to be constructed below-grade.
- There are streets within in the City that need to be avoided due to heavy commuter traffic or were recently repaved so have a moratorium for 5 years.
- The crossing of the I-5 for the potential connection to Irvine Ranch Water District.

These constraints have an effect on the cost and feasibility of pipeline, pumping, storage, and treatment infrastructure.

7.3 Non-Recycled Water Alternatives

Urban runoff is not a potential source of supply for non-potable reuse for City of Santa due to the following:

1. A majority of the City's low flow urban runoff is already being diverted to OCWD's Reclamation Plant No. 1 where it is treated to secondary effluent levels before being provided to OCWD for their GAP or GWRS recycled water systems for beneficial use in the Orange County Groundwater Basin.
2. Construction of additional diversion units are not planned and are not feasible due to size and cost.

Costs associated with stormwater capture for groundwater recharge and recovery were estimated is a focus of OCWD and would not be cost effect for the City to investigate. Imported water costs were projected using Metropolitan's 10-year Financial Forecast continue to increase. The Tier 1 Full Service Treated Volumetric Costs are provided on **Figure**



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7.3 from 2014 to 2024. Metropolitan costs beyond 2025 to 2035 were extrapolated using existing forecast data. MWDOC's increment rates were estimated at 12 percent of Metropolitan's Tier 1 cost based on MWDOC's 2013 average surcharge. A non-recycled water alternative is not feasible to the City. The total projected imported water costs are provided on **Figure 7.3** for reference.

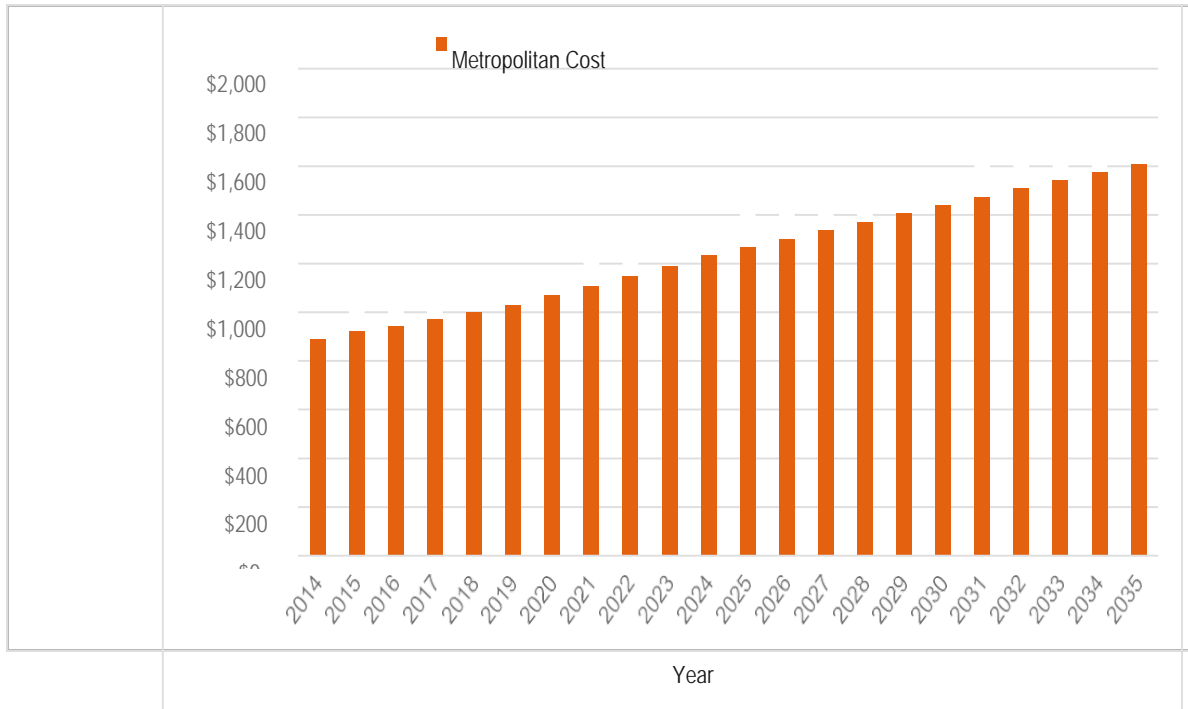


Figure 7-3 Imported Water Cost (Metropolitan 2017)

7.4 Water Conservation/Reduction Analysis

The 20x2020 Water Conservation Plan sets forth a statewide road map to maximize the state's urban water efficiency and conservation opportunities between 2009 and 2020, and beyond. It aims to set in motion a range of activities designed to achieve the 20 percent per capita reduction in urban water demand by 2020. These activities include improving an understanding of the variation in water use across California, promoting legislative initiatives that incentivize water agencies to promote water conservation, and creating evaluation and enforcement mechanisms to assure regional and statewide goals are met. The 20x2020 Plan discusses these many activities in detail.

As discussed in Section 3.5.1, the City is to achieve 95 percent of the applicable state hydrologic region target as set forth in the State's 20x2020 Water Conservation Plan as most Cities have in Orange County. This and other conservation methods are decrease the available wastewater to convert into recycled water. However, OCWD is expanding their GWRS project and have guaranteed the supply to GAP to its capacity by working with OCSA to supply secondary effluent wastewater from their Huntington Beach facility to Fountain Valley.

7.5 Pollution Control Alternatives

This is not applicable as additional pollution control are not required to comply with waste discharge requirements.

7.6 No Project Alternative

No Project Alternative costs include costs associated with offsetting potable water use, offsetting groundwater use, and reduced discharges to OCSA. Note that costs described below represent overall estimated No Project costs within the



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study area and are not intended to represent revenue potential. As described in the No Project description, by supplying recycled water to customers using potable water, additional potable supplies could be made available to other retailers in the region.

The Recommended Project would provide a very reliable supply to the project customers. While the City's current supply is very reliable, as described in the City's 2015 UWMP, mandatory rationing is initiated when the City water supply conditions reach a 30% shortage. Customers on recycled water would avoid this rationing. Valuation of the reliability benefit is difficult, and no studies are currently available documenting a reliability value for commercial/industrial and landscaping. However, a reasonable estimate can be made for the value to landscaping based on the cost of replacement. Based on typical cost range of \$35,000 per acre, and assuming that without the recycled water project a 30% water shortage would occur one year in every 50 due to shortages, requiring the replacement of approximately 30% of the landscaping during those water shortages.

This benefit can be quantified similarly to an insurance policy – the amount customers would be willing to pay annually to avoid a catastrophic event of losing the value of the landscaped areas in the community once every fifty years. Note that no customer outreach has been undertaken to determine to establish this valuation. Note that as the recycled water system would not be a looped system, reliability of the infrastructure may be less than that of the City's potable water system. As no analysis is available to quantify this effect, the reduced infrastructure reliability has not been estimated in this study.

Increased Regional Supply Reliability: The project would provide a new drought-proof water supply to the region, allowing the region to further reduce surface and groundwater water use during droughts. Current water supplies in the region rely heavily on surface water, which may be limited during drought years, and groundwater, which is already being utilized. The proposed project would improve the diversification of the region's water supplies, allowing the region to better conjunctively manage limited groundwater and surface water supplies.

Increased Groundwater Levels: By reducing the amount of groundwater pumping by the customer identified, a recycled water project could improve groundwater levels in the OC Groundwater Basin. The impacts to the groundwater basin and levels have not been studied to date, but potential benefits could include higher groundwater levels resulting in energy costs saving for remaining groundwater users in the region and more sustainable groundwater conditions.

7.7 Alternative Evaluation Criteria

An evaluation process was developed to account for the economic as well as non-economic impact for each project alternative. To enable capital investments that are justified and balanced across the City, best practice approaches incorporate cost/benefit analysis and triple bottom line (social, financial and environmental) prioritization and scoring criteria that can be used across any capital project. This approach enables projects to be fully vetted and justified and ensures project drivers and outcomes are clearly articulated.

The recycled water source, delivery and treatment alternatives proposed in this report are evaluated using a triple bottom line (TBL) approach to rank project alternatives. **Table 7.2** provides the framework for the TBL analysis. Each of the categories described has up to four identifying criteria which have an associated magnitude and score, enabling



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each alternative to be compared considering the non-economic and economic criteria. The categories and criteria used were specific to Santa Ana, and organized and are defined as follows:

Supply Reliability

- 0 **Level of Diversification** – Number of supply sources (i.e. imported water, groundwater, recycled water)
- 0 **Demand Served** – Portion of service area demand supplied
- 0 **Future Regulatory Concerns** – Potential regulatory changes that may prevent an alternative from moving forward or require modifications to the system in the future
- 0 **Reliability of Supply** – Reliability of supply during drought, emergencies such as a major earthquake event, and legal, environmental, and institutional restrictions

Community

- 0 **Stakeholder Acceptance** – Level of resident and customer acceptance
- 0 **Resident Impact / Constructability** – Level of impacts to residents commuting within the City and residential areas during construction
- 0 **Political Acceptability** - Level of city council and commission acceptance

Environmental

- 0 **Water Quality** – Degree to which source improves water quality
- 0 **Habitat Impacts** – Impact on habitat during construction and facility operation, and/or environmental permitting
- 0 **Energy Use / Carbon Footprint** – Energy use required to operate facilities including treatment and distribution

Economic Considerations

- 0 **Capital Cost** – Project costs including construction costs, contingencies, and implementation costs
- 0 **Economic Impact / Tourism** - Impact on tourist ingress/egress and local businesses
- 0 **Unit Cost per AFY** – Estimated cost per acre-feet per year (AFY) of water produced, based on life cycle cost (capital cost and annual operation and maintenance costs)



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Table 7-2 Triple Bottom Line Analysis Categorized Criteria

Category	Criteria	Scoring Value and Description			
		1	2	3	4
Supply Reliability	Level of Diversification	No change	>1 source	>2 sources	>3 sources
	Demand Served, AFY	0 - 30	31 - 60	61 - 100	>100
	Future Regulatory Concerns	High	Medium	Low	None
	Reliability of Supply	None	Low	Medium	High
Community	Stakeholder Acceptance	Low	Medium	High	Very High
	Resident Impact / Constructability	High	Medium	Low	None
	Political Acceptability	Low	Medium	High	Very High
Environmental	Water Quality	Unacceptable	Poor	Fair	Good
	Habitat Impacts	Very High	High	Medium	Low
	Energy Use/Carbon Footprint	Very High	High	Medium	Low
Economic	Capital Cost, Million dollars	>\$10	\$6 - \$10	\$2 - \$5	<\$2
	Economic Impact / Tourism	High	Medium	Low	None
	Unit Cost per AFY	>\$15,000	\$10,001 - \$15,000	\$5,000 - \$10,000	<\$5,000

7.8 Alternative Descriptions

The ability exists to provide additional recycled water to communities in numerous ways depending on the costs associated with imported water, construction, and O&M. Purchasing recycled water from OCWD, purchasing recycled water from IRWD, stormwater capture for groundwater recharge, purchase of recycled water from neighboring districts are all options that exist within the City. Purchasing recycled water from OCWD via several Phases or from IRWD via Phase 3B are analyzed in the following subsections.

The pipeline alignments were generated by TRHA with direction from the City. The alignments were determined to connect the potential customers identified in **Section 6**. The routing of the pipelines was determined using a number of factors. In general, though, the alignment maximizes the connections to the potential customers and also considers



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ease of construction in terms of vehicle traffic, road conditions, and freeway, railroad, and flood-control channel crossings.

For the water infrastructure and facilities planning component, planning level descriptions of required facilities were developed along with layout diagrams, proposed conveyance alignments and facility siting options that may be feasible. Conceptual level costs and schedules were also identified for each alternative.

Pumping is needed for potential customers for the northern portion of Phase 2, Phase 3A and Phase 3B. Pumping is required for Phase 4 because the source of supply (GWRS) does not have significant amount of pressure so booster pumps are required. Pumping for the above phase is required as the elevation only increases so pumping to all customers is required.

7.8.1 Purchase of Recycled Water from OCWD – Phase 1

City's Recycled Water Phase 1 Expansion will expand from the existing OCWD's GAP system on the east and west as well as some laterals to key potential recycled water customers. In the Phase 1 Expansion, the potential recycled water pipeline can provide approximately 1185 AFY of demand to over 141 potential recycled water customers. The City can connect to OCWD's recycled water pipeline at S. Harbor Blvd and W. MacArthur Blvd and expand north to W. Segerstrom Avenue to convert 10 potential customers. Three recycled water laterals from the OCWD's recycled water pipeline to customers along MacArthur Blvd are recommended south on S. Fairview Street, S. Greenville Street and S Plaza Drive. These service laterals could supply 5 potential customers as well as another nine customers along the pipeline route. Finally, an expansion to the west at the intersection of W. MacArthur Blvd and S. Flower Street was recommended to expand north on S. Flower Street and terminate just east of W. Dyer Rd as well expanded along W. MacArthur Blvd to the City boundary. Approximately 21,060 feet of pipe would need to be installed and recycled water conversions made. A 11"X17" of Phase 1 is contained in **Exhibit 3**.

Figure 7.4 shows the connection point (CP) to OCWD's system and the alignment described above. Demands within the community vary from 2.0 AFY to almost 117 AFY.

7.8.1.1 Stakeholders

The stakeholders involved in purchasing recycled from OCWD include:

1. OCWD
2. City of Santa Ana
3. RWQCB Region 9
4. SWRCB DDW
5. Orange County Healthcare Agency

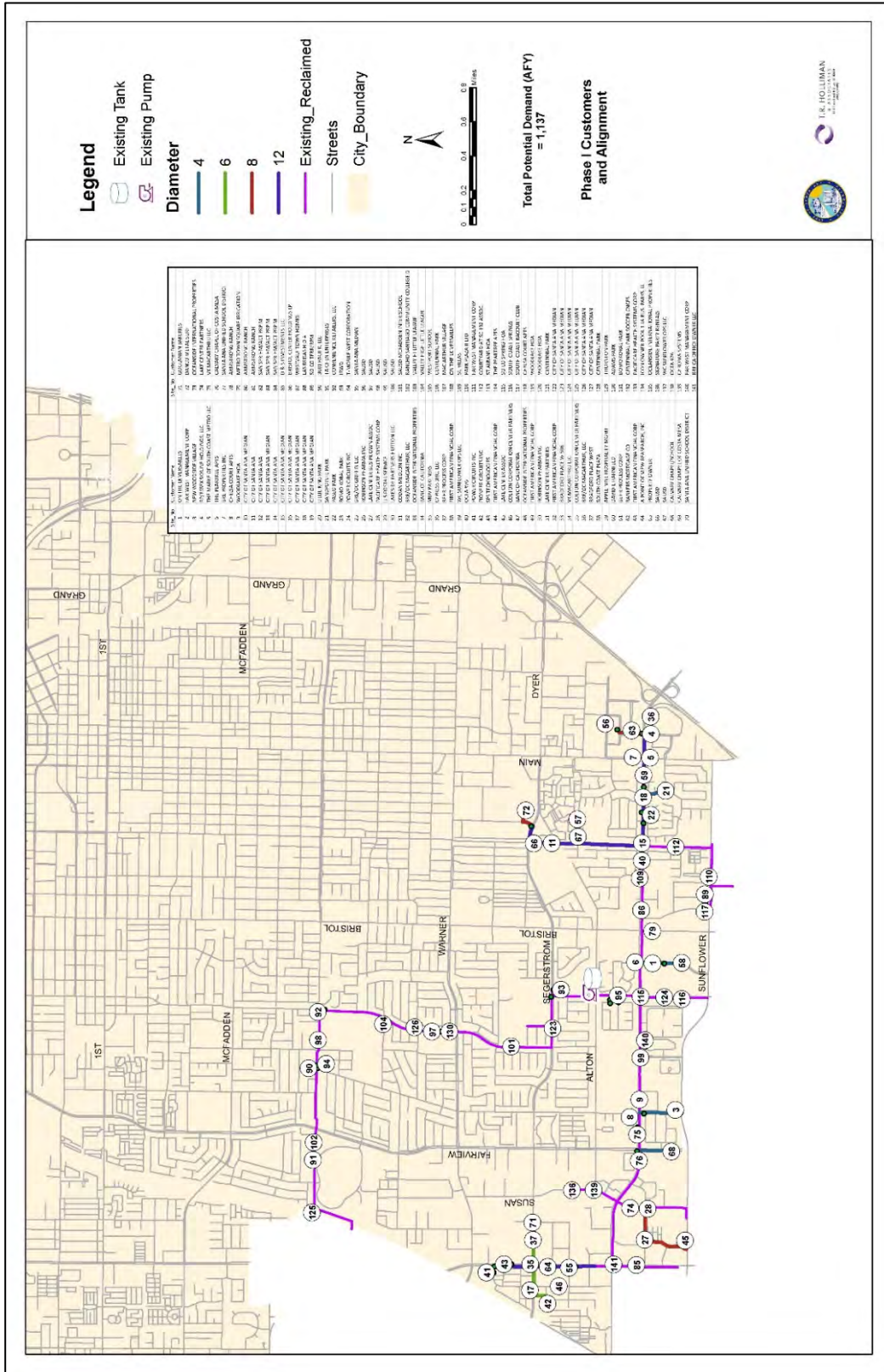
7.8.1.2 Potential Recycled Water Customers

Potential recycled water retrofit customers in Phase 1 are shown in **Exhibit 1**.



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Figure 7-4 Phase 1 Facilities





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7.8.1.3 Cost and Schedule

The costs associated with this alternative are provided in Table 7.3. The total estimated cost for 141 sites was approximately \$5.54 million. The life cycle cost, provided in cost per AF, is approximately \$1,140 per AF.

Table 7-3 Phase I Cost Estimate

Capital Costs	Quantity	Units	Unit Costs	Cost
Capital Facilities				
4-inch pipeline	4443	Feet	90	\$ 399,870
6-inch pipeline	2678	Feet	90	\$ 241,020
8-inch Pipeline	5082	Feet	120	\$ 609,840
12-inch Pipeline	8853	Feet	180	\$ 1,593,540
Onsite Conversion Costs	141	Site	\$5,000	\$705,000
Construction Subtotal				\$ 3,549,270
Contingency, percent	30%			\$ 1,064,781
Construction Total				\$ 4,614,051
Implementation Costs, percent	20%			\$ 922,810
Total Capital Costs				\$ 5,536,861
O&M Costs (\$/year)	Quantity	Units	Unit Costs	Cost
6-inch pipeline, percent	1%			\$ 3,999
6-inch pipeline, percent	1%			\$ 2,410
8-inch Pipeline, percent	1%			\$ 6,098
12-inch Pipeline, percent	1%			\$ 15,935
Total Annual O&M				\$ 24,444
Recycled water purchase (\$/year)	Quantity	Units	Unit Costs	Cost
OCWD Wholesale Rate	1137	AF	\$838	\$952,806
Present Value Calculation to \$/AF				
	\$			
Annualized Capital Cost for 25 Years (3%)	5,536,861	A/P	0.05743	\$ 317,982
Annual O&M				\$ 24,444
Annual RW Purchase				\$ 952,806
Annual Yield (AFY)	1137			
Cost per Acre-Foot (\$/AF)				\$ 1,139
Rounded Cost per Acre-Foot (\$/AF)				\$ 1,140



7.8.2 Purchase of Recycled Water from OCWD – Phase 2

City's Recycled Water Phase 2 Expansion will expand from the existing OCWD's GAP system north into the City to key potential recycled water customers. In the Phase 2 Expansion, the potential recycled water pipeline can provide approximately 631 AFY of demand to over 138 potential recycled water customers. The City can connect to OCWD's recycled water pipeline at the intersection of S. Fairview Street and Edinger Avenue then continue north on S. Fairview Street to W. 5th Street to the Flower Park Area which as a cluster of approximately 32 potential recycled water customers. The recycled water pipeline would continue north on Flower Street and send a major lateral west on W. 17th Street to supply a series 13 potential recycled water customers including Santa Ana College. The pipeline in Flower Street would continue north to W. Memory Lane (the most northern portion of the City) to serve approximately recycled water customers in the Bristol Memory Coalition and Fisher Park area. Approximately 45,715 feet of pipe would need to be installed and recycled water conversions made.

Figure 7.5 shows the connection point (CP) to OCWD's system and the alignment described above. Demands within the community vary from 2.0 AFY to almost 123 AFY. A 11"X17" of Phase 2 is contained in **Exhibit 3**.

7.8.2.1 Stakeholders

The stakeholders involved in purchasing recycled from OCWD include:

1. OCWD
2. City of Santa Ana
3. RWQCB Region 9
4. SWRCB DDW
5. Orange County Healthcare Agency

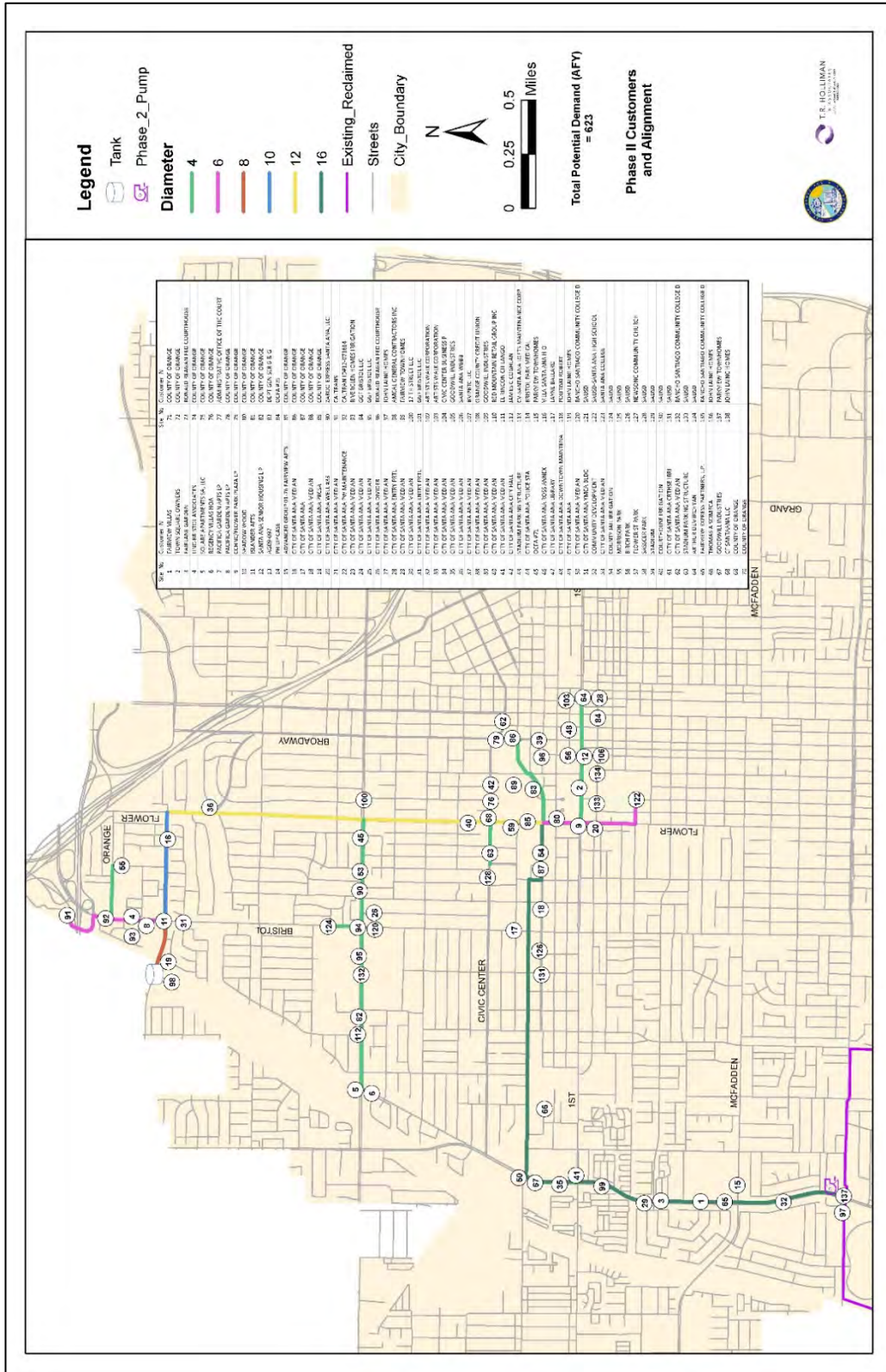
7.8.2.2 Potential Recycled Water Customers

Potential recycled water retrofit customers for Phase 2 are shown in **Exhibit 1**.



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Figure 7-5 Phase 2 Facilities





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7.8.2.3 Cost and Schedule

The costs associated with this alternative are provided in Table 7.4. The total estimated cost for 138 sites was approximately \$12.69 million. The life cycle cost, provided in cost per AF, is approximately \$2,120 per AF.

Table 7-4 Phase 2 Cost Estimate

Capital Costs	Quantity	Units	Unit Costs	Cost
Capital Facilities				
4-inch Pipeline	13049	Feet	90	\$ 1,174,410
6-inch Pipeline	2799	Feet	90	\$ 251,910
8-inch Pipeline	1096	Feet	120	\$ 131,520
10-inch Pipeline	2650	Feet	120	\$ 318,000
12-inch Pipeline	9188	Feet	180	\$ 1,653,840
16-inch Pipeline	16933	Feet	200	\$ 3,386,600
25 HP Package Pump Station	1	LS	\$30,000	\$ 30,000
Reservoir	50,000	Gallon	\$10.0/gallon	\$ 500,000
Onsite Conversion Costs	138	Site	\$5,000	\$ 690,000
Construction Subtotal				\$ 8,136,280
Contingency, percent	30%			\$ 2,440,884
Construction Total				\$ 10,577,164
Implementation Costs (Soft Costs), percent	20%			\$ 2,115,433
Total Capital Costs				\$ 12,692,597
O&M Costs (\$/year)	Quantity	Units	Unit Costs	Cost
4-inch Pipeline, percent	1%			\$ 11,744
6-inch pipeline, percent	1%			\$ 2,519
8-inch Pipeline, percent	1%			\$ 1,315
10-inch Pipeline, percent	1%			\$ 3,180
12-inch Pipeline, percent	1%			\$ 16,538
16-inch Pipeline	1%			\$ 33,866
Pump Station	5%			\$ 1,500
Reservoir	1%			\$ 5,000
Total Annual O&M				\$ 75,663
Recycled water purchase (\$/year)	Quantity	Units	Unit Costs	Cost
OCWD Wholesale Rate	631	AF	\$838	\$528,778
Present Value Calculation to \$/AF				
	\$			
Annualized Capital Cost for 25 Years (3%)	12,692,597	A/P	0.05743	\$ 728,936
Annual O&M				\$ 75,663
Annual RW Purchase				\$ 528,778
Annual Yield (AFY)	631			
Cost per Acre-Foot (\$/AF)				\$ 2,113
Rounded Cost per Acre-Foot (\$/AF)				\$ 2,120



7.8.3 Purchase of Recycled Water from OCWD – Phase 3A

City's Recycled Water Phase 3A Expansion will expand from the existing OCWD's GAP system north into the City to key potential recycled water customers. In the Phase 3A Expansion, the potential recycled water pipeline can provide 527.50 AFY of demand to over 123 potential recycled water customers. The City can connect to the eastern expansion of Phase 1 at the intersection of Flower Street and Dyer Road then continue east on Dyer Road then north on Main Street to E. Warner Avenue. At Warner Avenue the recycled water pipeline would continue east to S. Grand Avenue then proceed north to E. Chestnut Avenue. The pipeline would continue east then proceed north to supply customers in northeast Santa Ana area (Mabury Park and Portola Park areas). Approximately 52,150 feet of pipe would need to be installed and recycled water conversions made.

Figure 7.6 shows the connection point (CP) to OCWD's system and the alignment described above. Demands within the community vary from 2.0 AFY to almost 29.0 AFY. A 11"X17" of Phase 3A is contained in **Exhibit 3**.

7.8.3.1 Stakeholders

The stakeholders involved in purchasing recycled from OCWD include:

1. OCWD
2. City of Santa Ana
3. RWQCB Region 9
4. SWRCB DDW
5. Orange County Healthcare Agency

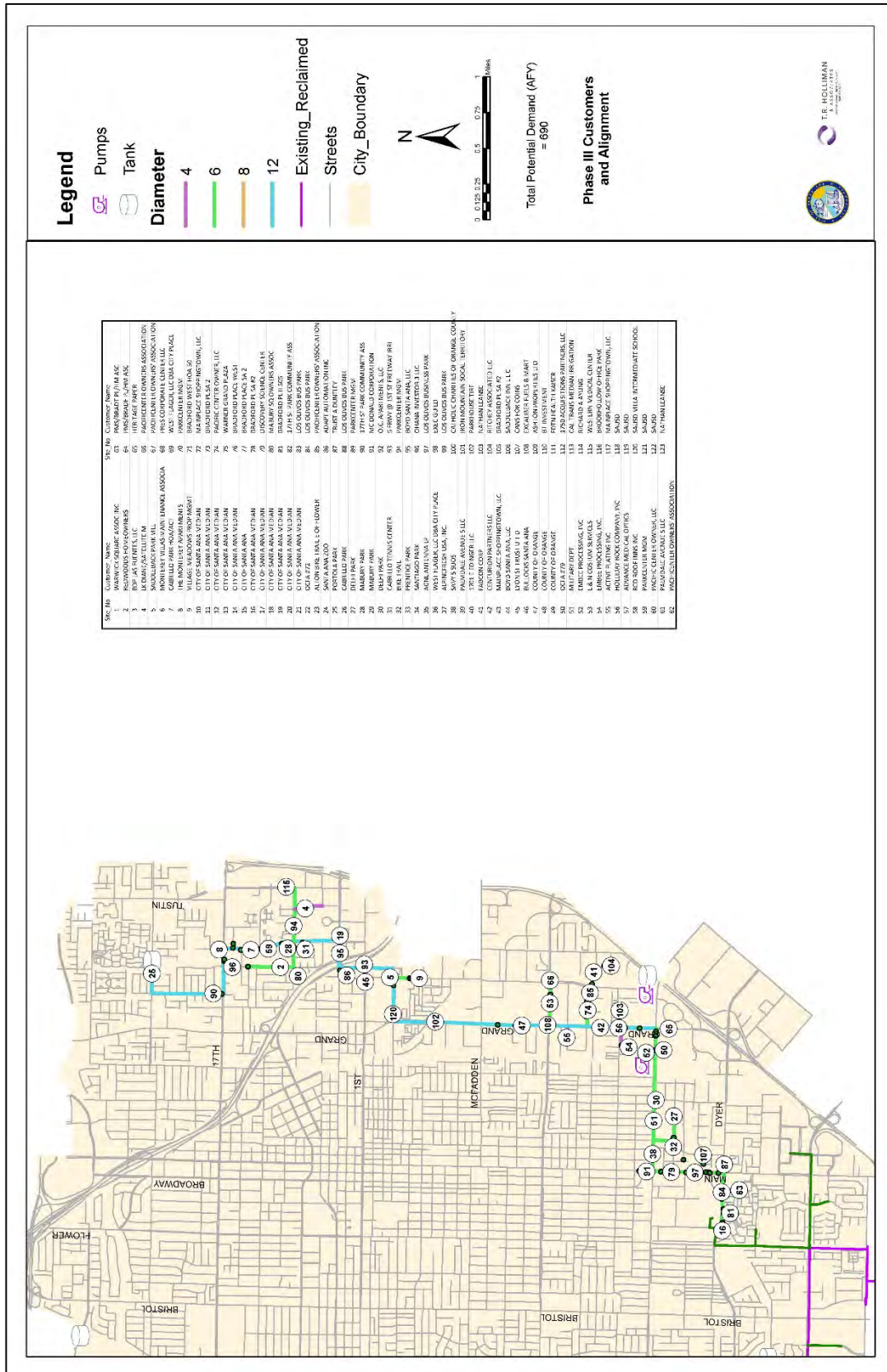
7.8.3.2 Recycled Water Customers

Potential recycled water retrofit customers for Phase 3A are shown in **Exhibit 1**.



CITY OF SANTA ANA RECYCLED WATER MASTER PLAN

Figure 7-6 Phase 3A Facilities





CITY OF SANTA ANA RECYCLED WATER MASTER PLAN

7.8.3.3 Cost and Schedule

The costs associated with this alternative are provided in Table 7.5. The total estimated cost for 123 sites was approximately \$14.54 million. The life cycle cost, provided in cost per AF, is approximately \$2,590 per AF.

Table 7-5 Phase 3A Cost Estimate

Capital Costs	Quantity	Units	Unit Costs	Cost
Capital Facilities				
4-inch Pipeline	2872	Feet	90	\$ 258,480
6-inch Pipeline	10579	Feet	90	\$ 952,110
12-inch Pipeline	38699	Feet	180	\$ 6,965,820
25 HP Package Pump Station	1	LS	\$30,000	\$ 30,000
Reservoir	50,000	Gallon	\$10.0/gallon	\$ 500,000
Onsite Conversion Costs	123	Site	\$5,000	\$ 615,000
Construction Subtotal				\$ 9,321,410
Contingency, percent	30%			\$ 2,796,423
Construction Total				\$ 12,117,833
Implementation Costs (Soft Costs), percent	20%			\$ 2,423,567
Total Capital Costs				\$ 14,541,400
O&M Costs (\$/year)	Quantity	Units	Unit Costs	Cost
4-inch Pipeline, percent	1%			\$ 2,585
6-inch pipeline, percent	1%			\$ 9,521
12-inch Pipeline, percent	1%			\$ 69,658
Pump Station	5%			\$ 1,500
Reservoir	1%			\$ 5,000
Total Annual O&M				\$ 88,264
Recycled water purchase (\$/year)	Quantity	Units	Unit Costs	Cost
OCWD Wholesale Rate	529	AF	\$838	\$443,302
Present Value Calculation to \$/AF				
	\$			
Annualized Capital Cost for 25 Years (3%)	14,541,400	A/P	0.05743	\$ 835,113
Annual O&M				\$ 88,264
Annual RW Purchase				\$ 443,302
Annual Yield (AFY)	529			
Cost per Acre-Foot (\$/AF)				\$ 2,584
Rounded Cost per Acre-Foot (\$/AF)				\$ 2,590



CITY OF SANTA ANA RECYCLED WATER MASTER PLAN

7.8.4 Purchase of Recycled Water from IRWD – Phase 3B

City's Recycled Water Phase 3B Expansion will expand from the existing IRWD's recycled water system north into the City to key potential recycled water customers. In the Phase 3B Expansion, the potential recycled water pipeline can provide 529 AFY of demand to over 123 potential recycled water customers. The City can connect to the IRWD recycled water system via a 5,560 feet pipeline from Redhill and Warner to the Phase 3B system. At Warner Avenue the recycled water pipeline would continue east to S. Grand Avenue then proceed north to E. Chestnut Avenue. The pipeline would continue east then proceed north to supply customers in northeast Santa Ana area (Mabury Park and Portola Park areas). Approximately 57,760 feet of pipe would need to be installed and recycled water conversions made.

Figure 7.7 shows the connection point (CP) to IRWD's system and the alignment described above. Demands within the community vary from 2.0 AFY to almost 29.0 AFY.

7.8.4.1 Stakeholders

The stakeholders involved in purchasing recycled from IRWD include:

1. OCWD
2. City of Santa Ana
3. RWQCB Region 9
4. SWRCB DDW
5. Orange County Healthcare Agency
6. Irvine Ranch Water District

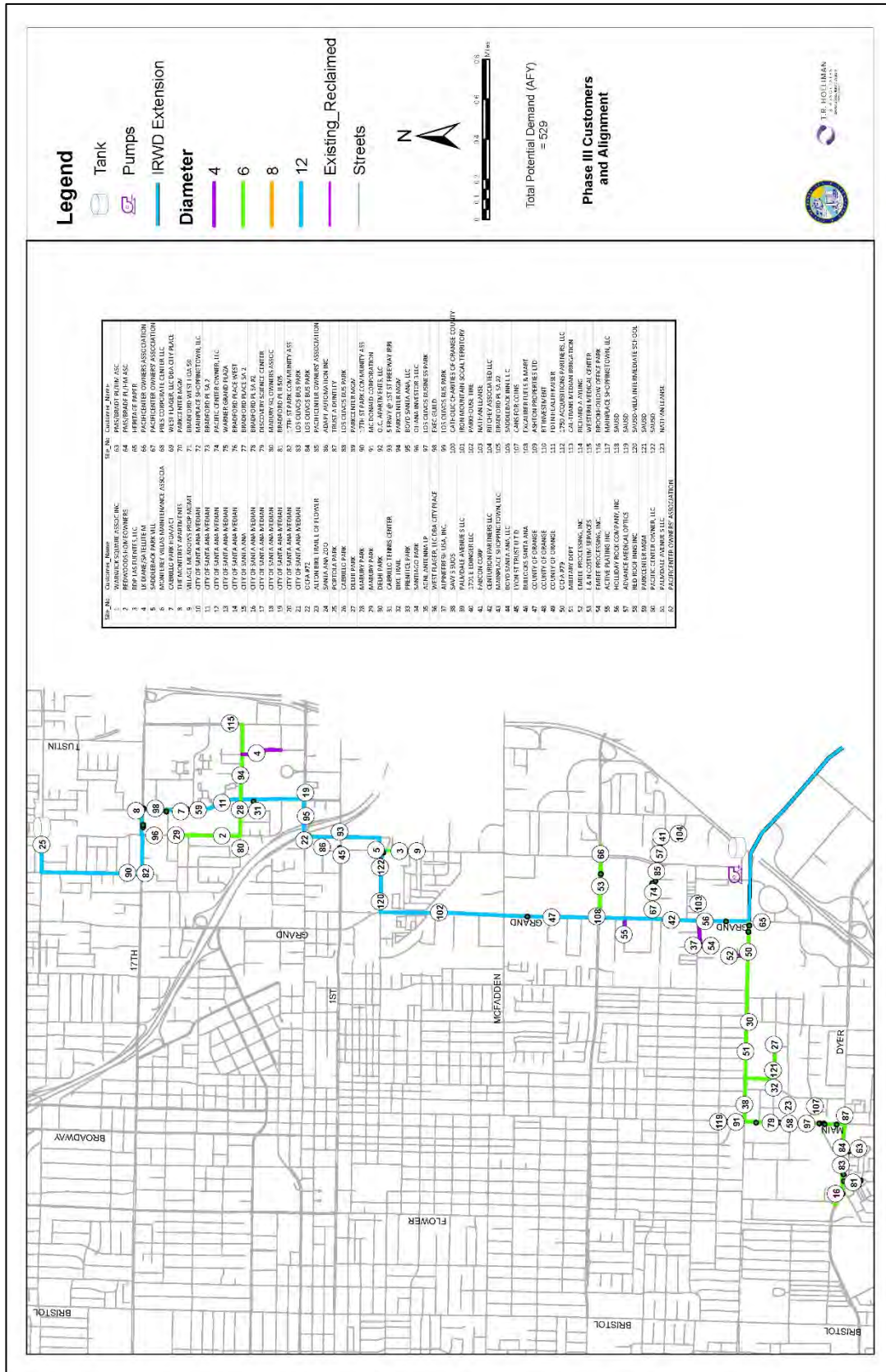
7.8.4.2 Recycled Water Customers

Potential recycled water retrofit customers for Phase 3B are shown in **Exhibit 1**. A 11"X17" of Phase 3B is contained in **Exhibit 3**.



CITY OF SANTA ANA RECYCLED WATER MASTER PLAN

Figure 7-7 Phase 3B Facilities





CITY OF SANTA ANA RECYCLED WATER MASTER PLAN

7.8.4.3 Cost and Schedule

The costs associated with this alternative are provided in Table 7.6. The total estimated cost for 123 sites was approximately \$13.76 million. The life cycle cost, provided in cost per AF, is approximately \$2,360 per AF.

Table 7-6 Phase 3B Cost Estimate

Capital Costs	Quantity	Units	Unit Costs	Cost
Capital Facilities				
4-inch Pipeline	2601	Feet	90	\$ 234,090
6-inch Pipeline	24454	Feet	90	\$ 2,200,860
8-inch Pipeline	5560	Feet	120	\$ 667,200
12-inch Pipeline	25139	Feet	180	\$ 4,525,020
80 HP Package Pump Station	1	LS	\$80,000	\$ 80,000
Reservoir	50,000	Gallon	\$10.0/gallon	\$ 500,000
Onsite Conversion Costs	123	Site	\$5,000	\$615,000
Construction Subtotal				\$ 8,822,170
Contingency, percent	30%			\$ 2,646,651
Construction Total				\$ 11,468,821
Implementation Costs (Soft Costs), percent	20%			\$ 2,293,764
Total Capital Costs				\$ 13,762,585
O&M Costs (\$/year)	Quantity	Units	Unit Costs	Cost
4-inch Pipeline, percent	1%			\$ 2,341
6-inch pipeline, percent	1%			\$ 22,009
8-inch Pipeline, percent	1%			\$ 6,672
12-inch Pipeline, percent	1%			\$ 45,250
Pump Station	5%			\$ 4,000
Reservoir	1%			\$ 5,000
Total Annual O&M				\$ 85,272
Recycled water purchase (\$/year)	Quantity	Units	Unit Costs	Cost
IRWD Wholesale Rate	529	AF	\$700	\$370,300
Present Value Calculation to \$/AF				
	\$			
Annualized Capital Cost for 25 Years (3%)	13,762,585	A/P	0.05743	\$ 790,385
Annual O&M				\$ 85,272
Annual RW Purchase				\$ 370,300
Annual Yield (AFY)	529			
Cost per Acre-Foot (\$/AF)				\$ 2,355
Rounded Cost per Acre-Foot (\$/AF)				\$ 2,360



7.8.5 Purchase of Recycled Water from OCWD – Phase 4

City's Recycled Water Phase 4 Expansion will expand from the existing OCWD's GWRS system west into the City to key potential recycled water customers with two alternatives for the point of connection to OCWD's GWRS. In the Phase 4 Expansion, the potential recycled water pipeline can provide approximately 690 AFY of demand to over 46 potential recycled water customers, respectively.

For Phase 4B Expansion, the City can connect to OCWD's GWRS system approximately at W. McFadden Avenue near the McFadden Tringle Habitat Restoration location.

The Phase 4A Expansion, the City can connect to OCWD's GWRS system approximately at W. 5th Street near Willowick Golf Course.

Depending on which phase is selected (Phase 4A or Phase 4B) the pipeline in McFadden Avenue or W. 5th Street could be decreased in diameter. The below write up and economics is based on the Phase 4B being selected. The recycled water pipeline would be installed west in W. McFadden Avenue then continue east and terminate on S. Harmon Street at Heritage Park. The recycled water pipeline would continue to the north on Harbor Blvd and terminate at the City boundary at Westminster Avenue. There will be three laterals which includes:

- 1st Lateral from Harbor Blvd west on W. 1st Street to Newhope Street which terminates at Newhope Library
- 2nd lateral from Harbor Blvd east on W 5th Street to Santa Ana River which terminates at Willowick Golf Course
- 3rd lateral from Harbor Blvd west on W. Hazard Avenue to Newhope Street which terminates at Rosita Park.

Figure 7.8 shows the connection point (CP) to OCWD's GWRS system and the alignment described above. Demands within the community vary from 2.0 AFY to almost 199 AFY.

7.8.5.1 Stakeholders

The stakeholders involved in purchasing recycled from OCWD include:

1. OCWD
2. City of Santa Ana
3. RWQCB Region 9
4. SWRCB DDW
5. Orange County Healthcare Agency

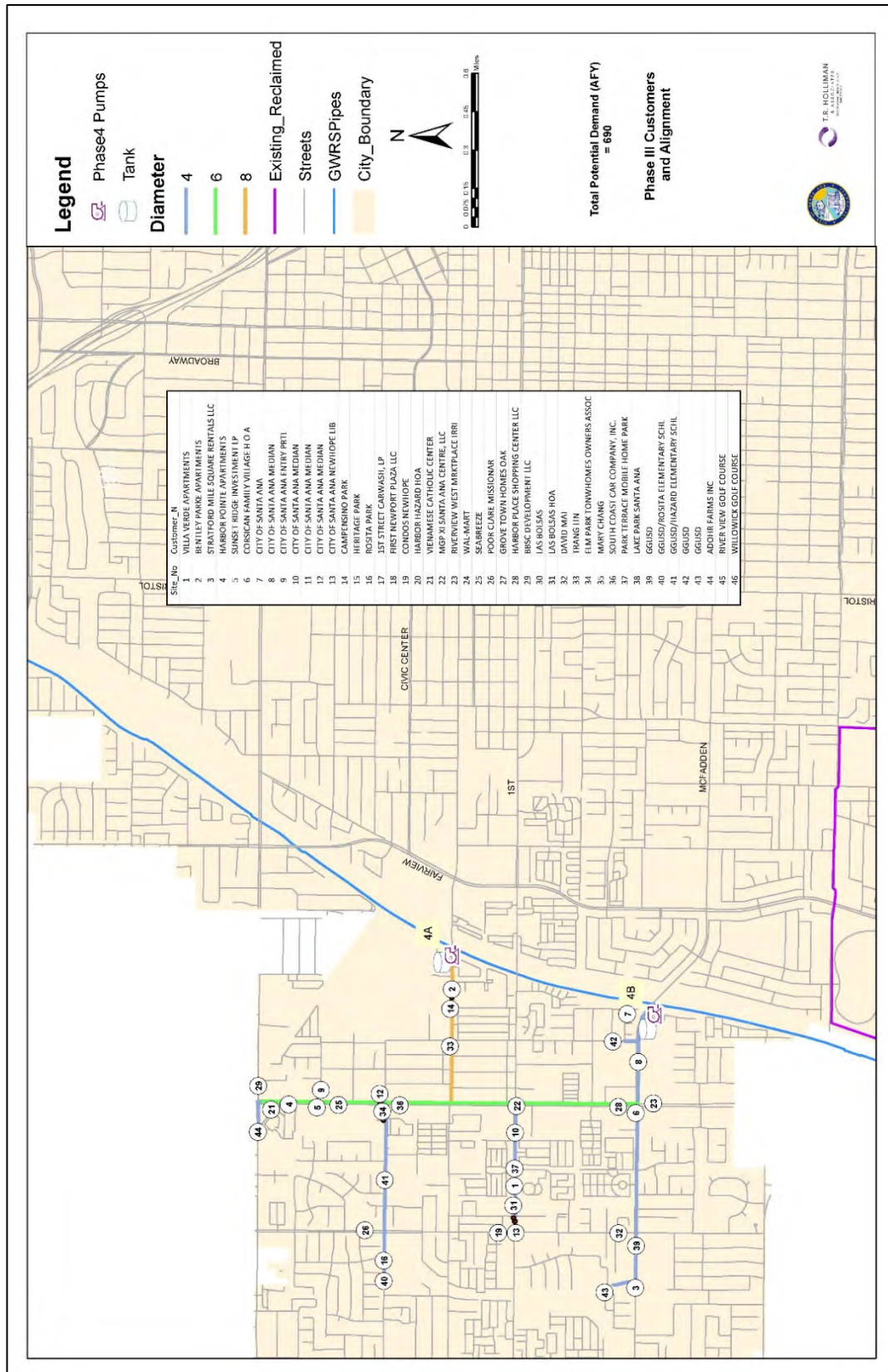
7.8.5.2 Recycled Water Customers

Potential recycled water retrofit customers for Phase 4 are shown in **Exhibit 1**. A 11"X17" of Phase 4 is contained in **Exhibit 3**.



CITY OF SANTA ANA RECYCLED WATER MASTER PLAN

Figure 7-8 Phase 4 (Two Point of Connection Options)





CITY OF SANTA ANA RECYCLED WATER MASTER PLAN

7.8.5.3 Cost and Schedule

The costs associated with Phase 4A is provided in Table 7.7. For Phase 4A the total estimated cost for 46 sites was approximately \$4.13 million. The life cycle cost, provided in cost per AF, is approximately \$1,230 per AF.

Table 7-7 Phase 4A Cost Estimate

Capital Costs	Quantity	Units	Unit Costs	Cost
Capital Facilities				
4-inch Pipeline	12372	Feet	90	\$ 1,113,480
6-inch Pipeline	7833	Feet	90	\$ 704,970
8-inch Pipeline	2346	Feet	120	\$ 281,520
30 HP Package Pump Station	1	LS	\$50,000	\$ 50,000
Reservoir	50,000	Gallon	\$10.0/gallon	\$ 500,000
Onsite Conversion Costs		Site	\$5,000	\$0
Construction Subtotal				\$ 2,649,970
Contingency, percent	30%			\$ 794,991
Construction Total				\$ 3,444,961
Implementation Costs, percent	20%			\$ 688,992
Total Capital Costs				\$ 4,133,953
O&M Costs (\$/year)	Quantity	Units	Unit Costs	Cost
4-inch Pipeline, percent	1%			\$ 11,135
6-inch pipeline, percent	1%			\$ 7,050
8-inch Pipeline, percent	1%			\$ 2,815
Pump Station	5%			\$ 2,500
Reservoir	1%			\$ 5,000
Total Annual O&M				\$ 28,500
Recycled water purchase (\$/year)	Quantity	Units	Unit Costs	Cost
OCWD Wholesale Rate	690	AF	\$838	\$578,220
Present Value Calculation to \$/AF				
	\$			
Annualized Capital Cost for 25 Years (3%)	4,133,953	A/P	0.05743	\$ 237,413
Annual O&M				\$ 28,500
Annual RW Purchase				\$ 578,220
Annual Yield (AFY)	690			
Cost per Acre-Foot (\$/AF)				\$ 1,223
Rounded Cost per Acre-Foot (\$/AF)				\$ 1,230



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The costs associated with Phase 4B is provided in **Table 7.8**. For Phase 4A the total estimated cost for 46 sites was approximately \$4.1 million. The life cycle cost, provided in cost per AF, is approximately \$1,220 per AF.

Table 7-8 Phase 4B Cost Estimate

Capital Costs	Quantity	Units	Unit Costs	Cost
Capital Facilities				
4-inch Pipeline	10797	Feet	90	\$ 971,730
6-inch Pipeline	10179	Feet	90	\$ 916,110
8-inch Pipeline	1575	Feet	120	\$ 189,000
30 HP Package Pump Station	1	LS	\$50,000	\$ 50,000
Reservoir	50,000	Gallon	\$10.0/gallon	\$ 500,000
Onsite Conversion Costs		Site	\$5,000	\$0
Construction Subtotal				\$ 2,626,840
Contingency, percent	30%			\$ 788,052
Construction Total				\$ 3,414,892
Implementation Costs, percent	20%			\$ 682,978
Total Capital Costs				\$ 4,097,870
O&M Costs (\$/year)	Quantity	Units	Unit Costs	Cost
4-inch Pipeline, percent	1%			\$ 9,717
6-inch pipeline, percent	1%			\$ 9,161
8-inch Pipeline, percent	1%			\$ 1,890
Pump Station	5%			\$ 2,500
Reservoir	1%			\$ 5,000
Total Annual O&M				\$ 28,268
Recycled water purchase (\$/year)	Quantity	Units	Unit Costs	Cost
OCWD Wholesale Rate	690	AF	\$838	\$578,220
Present Value Calculation to \$/AF				
Annualized Capital Cost for 25 Years (3%)	4,097,870	A/P	0.05743	\$ 235,341
Annual O&M				\$ 28,268
Annual RW Purchase				\$ 578,220
Annual Yield (AFY)	690			
Cost per Acre-Foot (\$/AF)				\$ 1,220
Rounded Cost per Acre-Foot (\$/AF)				\$ 1,220



7.9 Recommended Alternative

It is recommended to implement Phase 1, which will deliver recycled water to the identified potential users. Implementing a recycled water distribution system will reduce the dependence on potable water supply over the long term and will allow the City to purchase the relatively cheaper recycled water supply. Phase 1 will also allow potential expansion of the recycled water distribution system to the City of Santa Ana. Also, the Phase 1 is anticipated to meet a useful life of approximately 50-years.

In addition to this, as of 2018, the cost of recycled water is estimated to be on par with import water costs. The competitive cost of recycled water is evidenced by the 2018 Metropolitan Water District (MWD) for Tier 1 Full Service Untreated Water cost of \$1,015/AF. The rate includes the Tier 1 Supply Rate, System Access Rate, Water Stewardship Rate, and System Power Rate. Tier 1 is assumed as Tier 2 rates are reserved for higher volume users. For more information regarding imported water rate, please see <http://www.mwdh2o.com/WhoWeAre/Management/Financial-Information>.

Imported water supplied to the City is through MWD supply system. Therefore, it is assumed that all imported water supplied to the City will have a minimum supply rate of the most current MWD Tier 1 Full Service Untreated Water Rate. Using the 2018 value of \$1,015/AF in comparison with the estimated cost of \$1,140/AF for the implementation of the recommended alternative, recycled water provides a competitive rate.

Furthermore, the Phase 1 addresses both the State Planning Priorities in Section 65041.1 of the Governmental Code and Sustainable Water Resource Management Priorities. The State Planning Priorities Section 65041.1 is addressed in the Governmental Code Article 5, Section 65041.1, Subsection b, by "protecting environmental and agricultural resources by providing recycled water resources for irrigation purposes". The Sustainable Water Resource Management Priorities are addressed, because the project is in accordance with State Water Resources Control Board Resolution No. 2008-0030 by committing to sustainable water use practice through recycled water use.

It is not recommended to implement the recycled water supplies for Phase 4 until an agreement between the City and OCWD be drafted before moving forward. This agreement would be necessary since the primary use of the recycled water for GWRS is for groundwater replenishment and not for indirect potable reuse. Along with this, the projected cost to implement the recycled water supply system is cost prohibitive.



SECTION 8 RECOMMENDED FACILITIES PROJECT PLAN

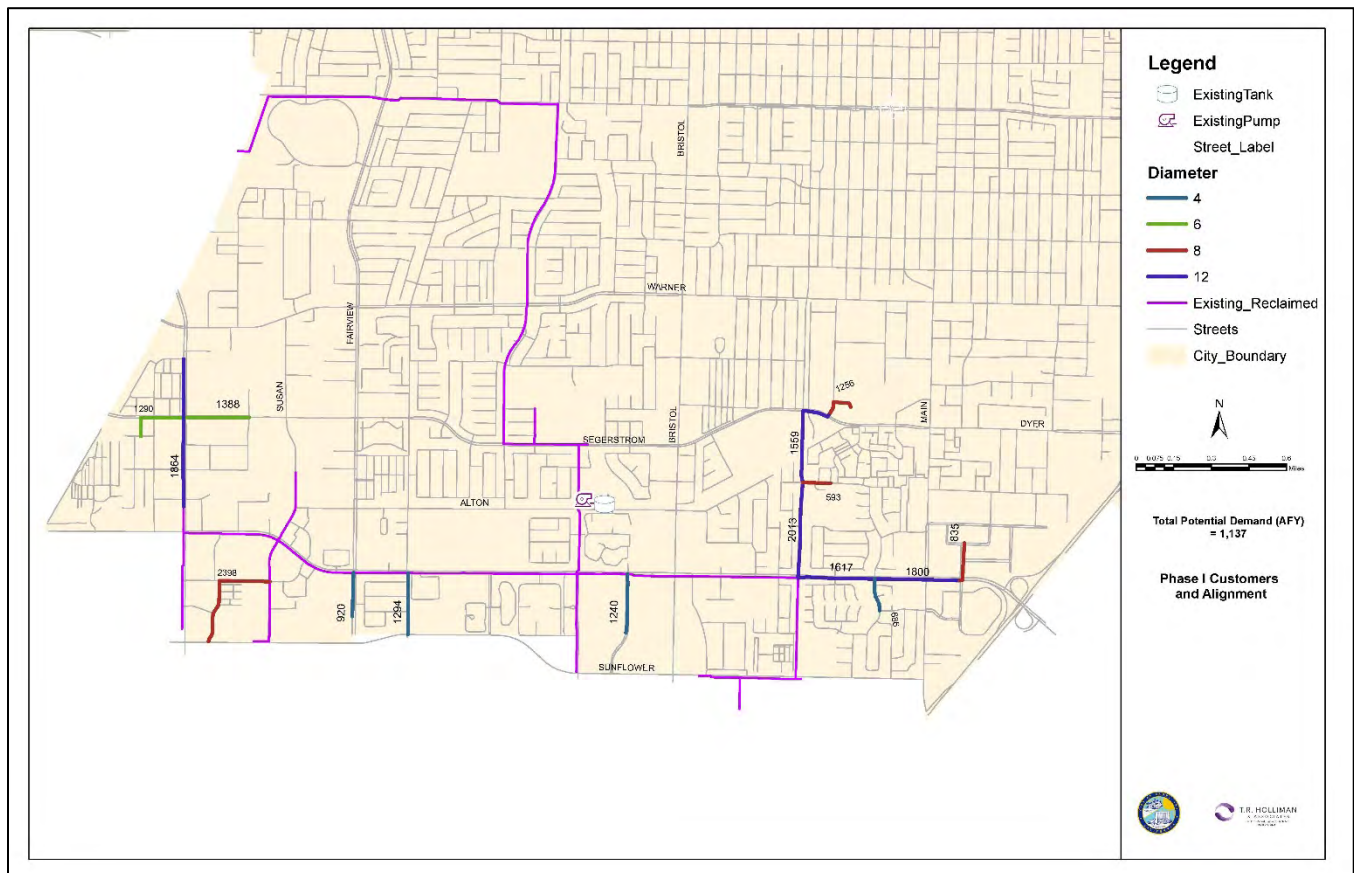
This section summarizes the infrastructure and operational requirements for the recommended alternative in Section 7 of this report.

8.1 Pipeline Alignment

The recycled water distribution system will be supplied from the Orange County Water District (OCWD) Green Acres Project (GAP) recycled water system, and the OCWD's Groundwater Replenishment Project (GWRP). It is recommended that the system be split into four phases: Phase 1, Phase 2, Phase 3, and two potential Phase 4 systems depending on the final location selected for the Phase 4 pump station and reservoir. The retrofit sites for each phase are shown in Exhibit 2. Exhibit 3 contains 11"x17" drawings of each of the phase described in the sections to follow.

Phase 1: The facilities in Phase 1 are shown in Figure 8-1. This phase will consist of constructing laterals from the existing GAP pipeline in MacArthur Blvd. and extensions in Fairview and Flower Streets. The pipelines will consist of 4,443 LF of 4-inch pipeline, 2,678 LF of 6-inch pipeline, 5,082 LF of 8-inch pipeline and 8,853 LF of 12-inch pipeline. All of the pipelines will be constructed in City streets.

Figure 8-1 Proposed Alignment and Pipeline Sizes for Phase 1

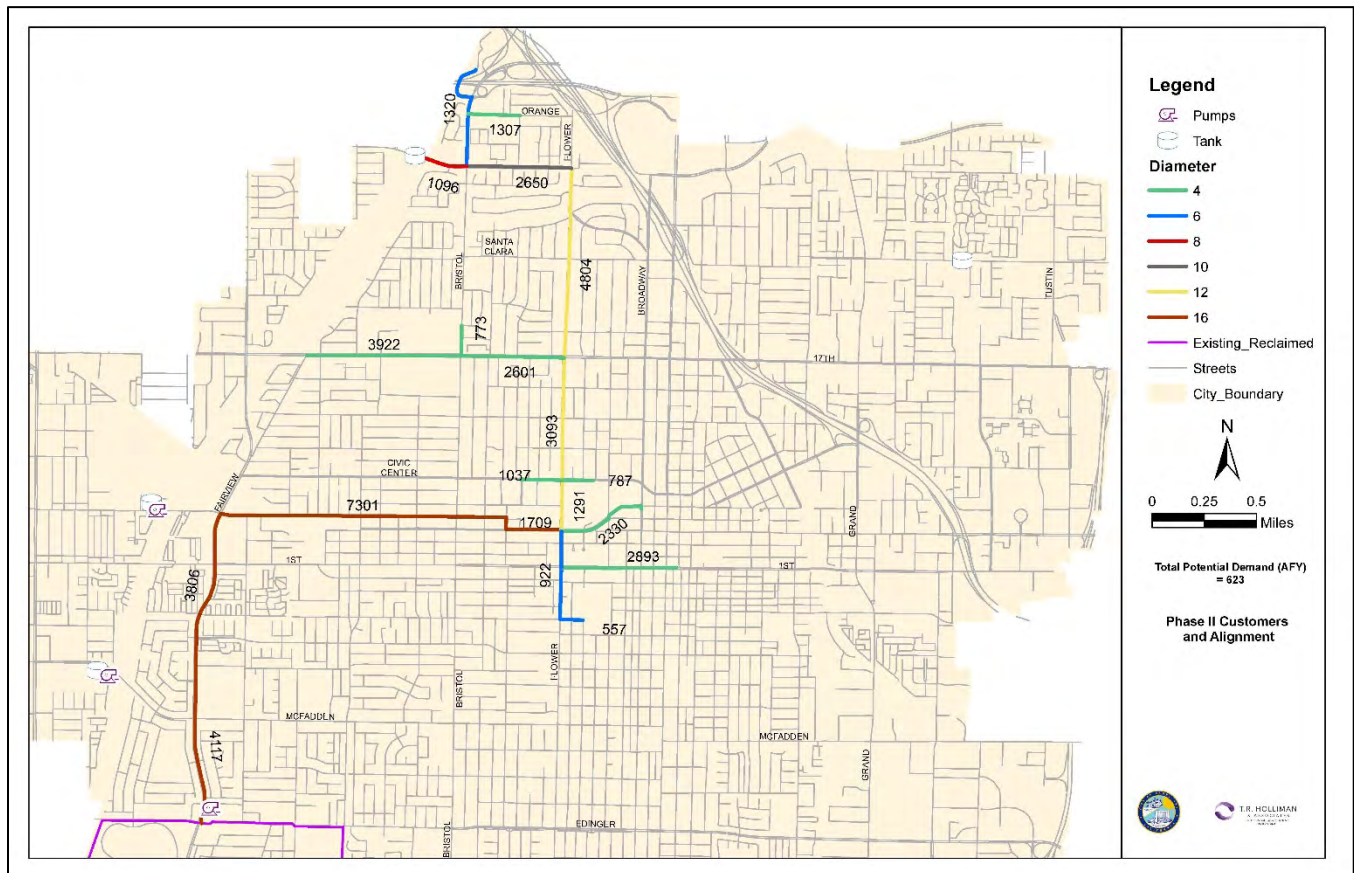




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Phase 2: The facilities in Phase 2 are shown in **Figure 8-2**. This phase will consist of constructing new pipelines from the GAP north into the City. The primary pipelines will begin at MacArthur Blvd from a new 25 HP pump station in Centennial Park. Then they will extend north in Fairview to 1st Street, then easterly in 1st Street to Flower then north in Flower to West Santa Clara Avenue, and finally north in Bristol. Phase 2 will also include a new 50,000-gallon storage reservoir. The pipelines will consist of 13,049 LF of 4-inch pipeline, 2,799 LF of 6-inch pipeline, 1,096 LF of 8-inch pipeline, 2,650 LF of 8-inch pipeline, 9,188 LF of 12-inch pipeline, and 16,933 LF of 16-inch pipeline.

Figure 8-2 Proposed Alignment and Pipeline Sizes for Phase 2

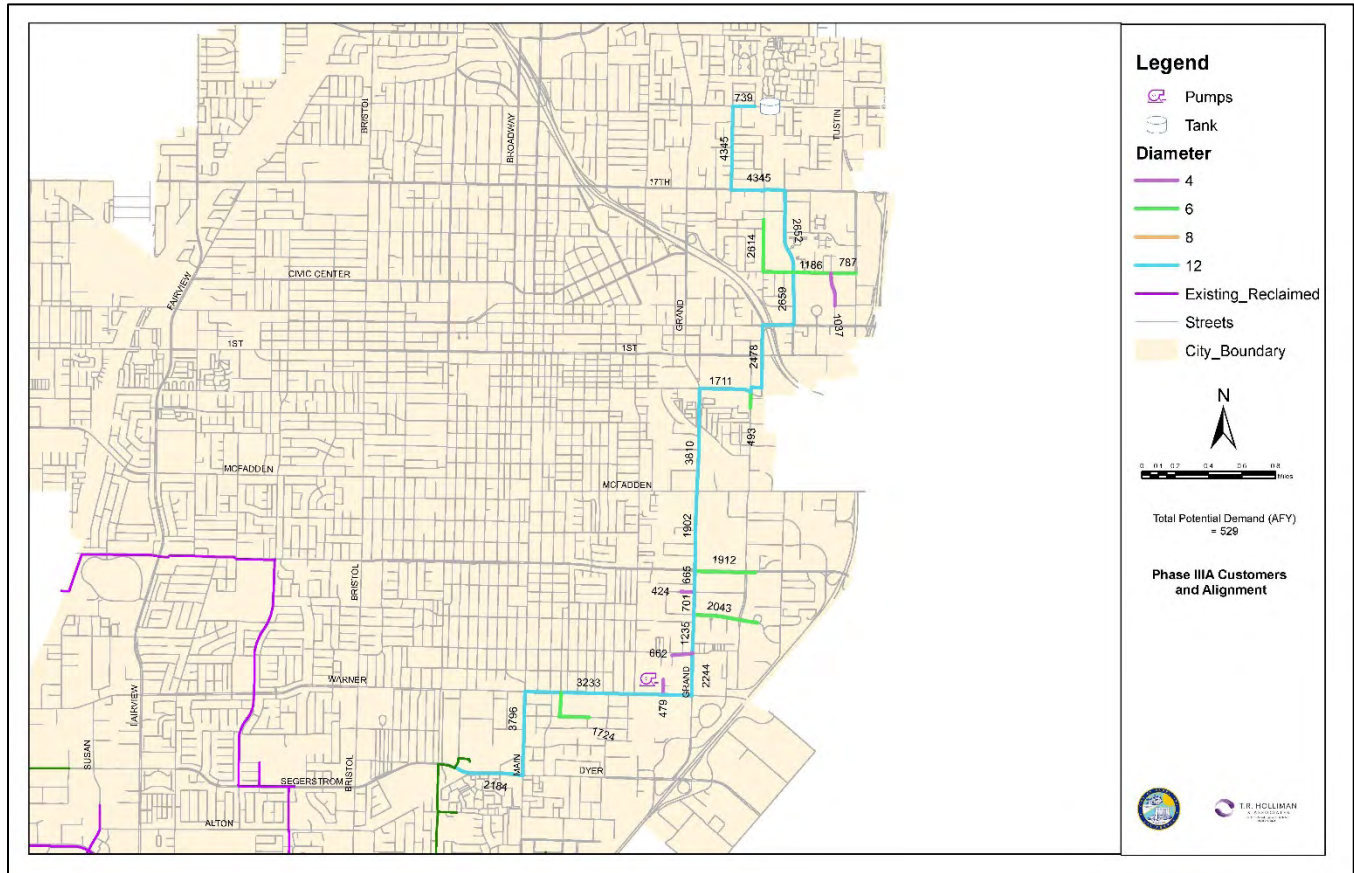


Phase 3: The pipelines in Phase 3 will begin by interconnecting to the Phase I pipeline in Flower, then easterly in Dyer Road to Grand Avenue, then north in Grand Avenue to East Main Street. The pipelines then turn east in East Main Street, then north in Tustin Avenue as shown in **Figure 8-3**. The Phase 3 pipelines will include 2,872 LF of 4-inch pipeline, 10,759 LF of 6-inch pipeline, and 38,699 LF of 12-inch pipeline. This phase will also include a 25 HP booster station and a 50,000-gallon reservoir



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Figure 8-3 Proposed Alignment and Pipeline Sizes for Phase 3



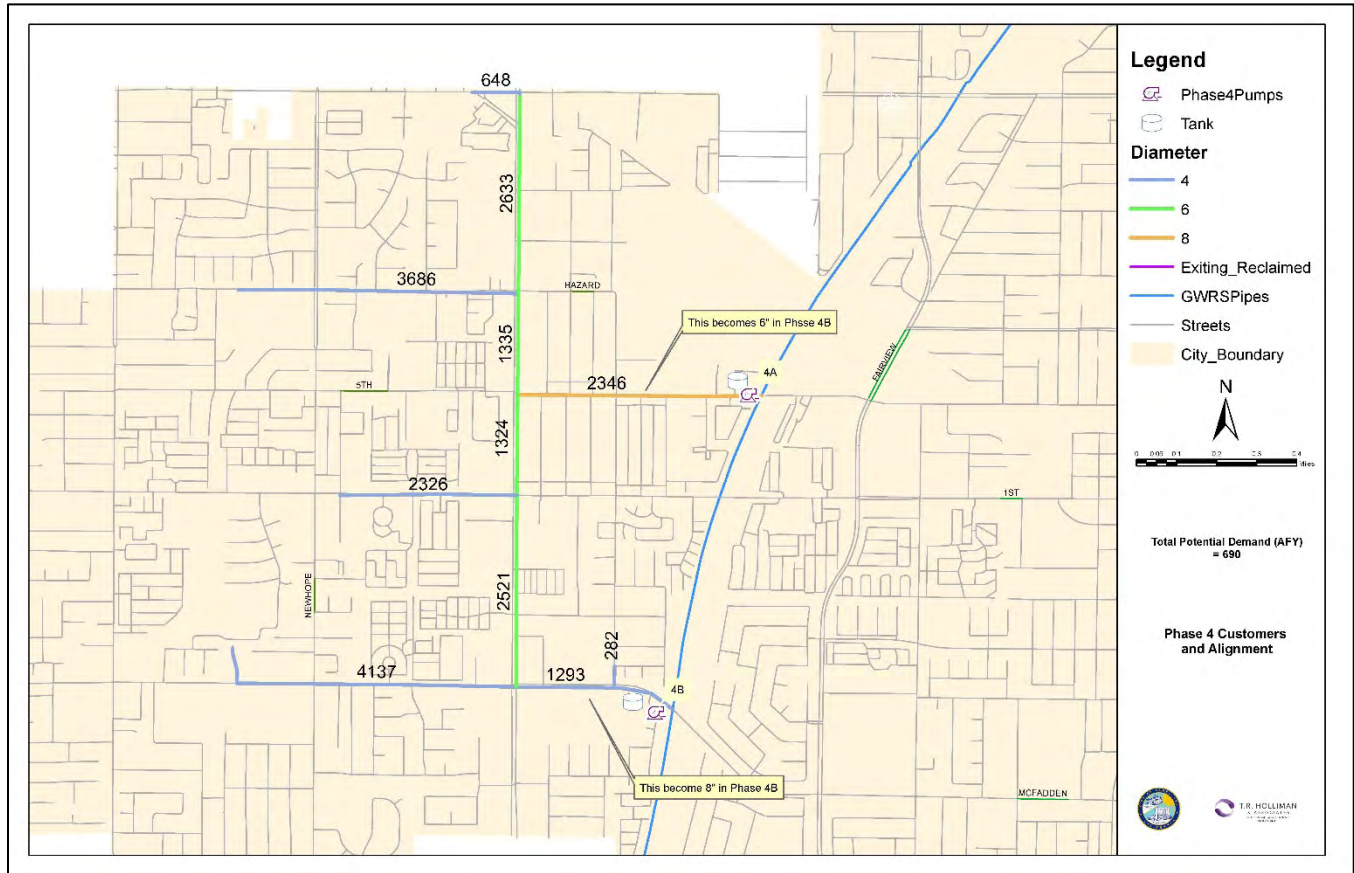
Phase 4: There are two options for Phase 4 depending on the final location selected by the City for the required reservoir and booster pump. Two cost calculations were made for Phase 4a and Phase 4b which are described in Section 7. A combined Phase 4 diagram is shown in Figure 8-4. The Phase 4 pipelines would be connected to the GWRS pipeline unlike Phase 1 through Phase 3 which are connected to the GAP pipeline. The City currently owns two parcels that could be used for the reservoir Phase 4 reservoir and pump station. Because of this option Phase 4a was developed assuming the reservoir and pump station would be located at West 5th Street and the Santa Ana River adjacent to Willowick Golf Course. Phase 4B was developed assuming the reservoir and pump station would be located at McFadden and the Santa Ana River. The model results indicate only a small difference in the size and lengths of pipelines. There is only a \$171,241 difference in cost between the two options. Therefore, the final location will likely be selected on the basis of other factors besides cost.

The Phase 4 pipelines will be located in Harbor Blvd. beginning at McFadden Avenue with pipelines extending in McFadden east and west, then northerly to Westminster Avenue with laterals in Hazard, West 5th Street, and 1st Street. The facilities in Phase 4A include 12,372 LF of 4-inch pipeline, 7,833 LF of 6-inch pipeline, 2,346 LF of 8-inch pipeline, a 30 HP pump station, and a 50,000-gallon reservoir. If the tie-in point is moved to Option 4B, then the resultant system will include 10,797 LF of 4-inch pipeline, 10,179 LF of 6-inch pipeline, and 1,575 LF of 8-inch pipeline, a 30 HP pump station, and a 50,000-gallon reservoir.



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Figure 8-4 Proposed Alignment and Pipeline Sizes for Phase 4





8.2 Pump Stations and Reservoir

The proposed recycled water distribution system will require pump stations to maintain system pressure. The Phase 2 pump station will be a new 25 HP pump station located at the corner of Fairview Street and Edinger. A hydraulic analysis of the proposed system was performed using a hydraulic model. The vertical turbine pump will be rated for 1,000 gpm at 252 feet of total dynamic head (TDH). The Phase 2 Reservoir will be a 50,000-gallon reservoir and serve as a forebay for the pump station. It was assumed in the cost analysis that this would be an above ground steel tank, but site and aesthetic considerations may require it be buried.

The Phase 3 pump station will be a new 25 HP pump station located at the corner of Warner Avenue and Grand Avenue. A hydraulic analysis of the proposed system was performed using a hydraulic model. The vertical turbine pump will be rated for 1,000 gpm at 384 feet of total dynamic head (TDH). The Phase 3 Reservoir will be a 50,000-gallon reservoir and serve as a forebay for the pump station. As with the Phase 2 Reservoir, it was assumed in the cost analysis that this would be an above ground steel tank, but site and aesthetic considerations may require it be buried.

The Phase 4 pump station and reservoir will consist of a 30 HP pump station with a 50,000-gallon forebay reservoir. The pump will be rated for 1,000 gpm at 174 feet of TDH.

For each pump station there are three options for the pump station configurations: 1) One pump only; 2) One duty and one standby; 3) One duty, one standby and one jockey pump. Option 1 was eliminated because it is important to have a standby unit to maintain the system pressure when the duty pump fails. Option 2 was eliminated because it is beneficial to have a jockey pump to maintain the system pressure during low flow conditions. Therefore, Option 3 is recommended for the pump station configuration.

The pump station will be designed so that one pump will meet the peak flow with a backup pump. A jockey pump will be installed to maintain system pressure during low flow conditions, which could be experienced during the winter months. The jockey pump will not operate when the larger pump is operating. Variable Frequency Drives (VFDs) are also recommended for each pump. VFDs will allow the pumps to operate for a variety of flow conditions while maintaining a higher efficiency. The pump station is estimated to be 30 feet by 40 feet, which could be sized to 30 feet by 50 feet to have extra space for expansion.

8.3 Potential Users

The potential users are identified in Section 6 and the proposed alignments will be able to serve most customers listed in Exhibit 1.

8.4 Implementation Plan

8.4.1 Coordination with Water Suppliers and Potential Users

The wholesale-retail agreement with OCWD will need to be amended to include all viable potential City of Santa Ana recycled water customers. Since OCWD is the primary supplier of recycled water to the City they will prepare the amendment. A copy of the current agreement between OCWD and the City is included in **Appendix F**. A recycled water mandatory use ordinance (MOU) will also be required for recycled water implementation within the City; a draft MOU is included in **Appendix G**.



8.4.2 Right-Of-Way and Permits

The majority of the recycled water system will be constructed in the right-of-way owned by the City. There are several permits that will be required to construct the recycled water distribution system. A summary of the permitting agencies is listed in **Table 8-1**. Since the effluent from OCWD meets the requirement of Title 22, the City is not required to provide a Title 22 Engineering Report. The City will need to obtain NOI from SWRCB and RWQCB, as discussed in **Section 5** prior to the implementation of the recycled water system.

Table 8-1 Permit Jurisdiction Agencies Summary

Agency	Type of Permit
City of Santa Ana	Traffic Control and Encroachment Permit
Regional Water Quality Control Board – Santa Ana Region	Stormwater Discharge Associated with Construction and NOI
State Water Resources Control Board Division of Drinking Water	Review and Comment Letter on the Recycled Water Customer Drawings or Industrial Engineering Reports
Regional Water Quality Control Board – Santa Ana Region	NPDES and NOI
Orange County Healthcare Agency	Inspect the Recycled Water Customer Conversions

8.4.3 Traffic Control

The vast majority of the recycled water system will be constructed in City streets. It will be necessary to provide traffic control around the work areas to protect the public and construction personnel. The City will require the contractor to prepare traffic control plans for review by the City of Santa Ana Public Works Department.

8.4.4 Water Rights Impact

By implementing the recycled water system, the City will diversify its water supply portfolio which, in turn, will result in reducing the City's dependence on imported water from MWD and potentially its reliance on groundwater supplies. The recommended recycled water system will have no impact to the effluent discharge point.

8.4.5 Schedule

Upon completion of this feasibility study, the City will develop a schedule to pursue the recommended facilities. This will be dependent upon the availability of funding.

8.4.6 On-site Conversion

On site conversion is required for the customers after the distribution system is installed as discussed in **Section 6**.



SECTION 9 CONSTRUCTION FINANCING PLAN AND REVENUE PROGRAM

This section addresses the financing plan for the City of Santa Ana recycled water distribution system, the opinion of probable construction cost.

9.1 Funding

Funding options have been set up by the State of California and the Federal government to help alleviate some of the financial burden associated with the construction of a recycled water distribution system.

9.1.1 State Funding – Water Recycling Funding Program

The State Water Resources Control Board (SWRCB) provides funding assistance for the planning, design and construction of water recycling projects. The mission of the Water Recycling Funding Program (WRFP) is:

“to promote the beneficial use of treated municipal wastewater (water recycling) in order to augment fresh water supplies in California by providing technical and financial assistance to agencies and other stakeholders in support of water recycling projects and research.”

The funding for the construction of water recycling facilities is primarily derived from the Clean Water State Revolving Fund (CWSRF) loan program. Previously construction grants were available through Proposition 1, however all of the grant funding has been allocated. Because of this, funds received through the CWSRF will be through debt funding. The current CWSRF loan rate is 2.85%.

9.1.2 Federal Funding

Federal funding for recycled water projects is available through the U.S. Bureau of Reclamation. Title XVI is the Reclamation Wastewater and Groundwater Study and Facilities Act of 1992 and provides a program for federal participation through cost sharing of specific water reuse projects up to certain amounts specified in the Act. U.S. Bureau of Reclamation is authorized to fund up to 25% of the total project cost, up to \$20 million.

9.2 Opinion of Probable Construction Costs

A Class 5 Opinion of Probable Construction Cost (OPCC) was developed for the recycled water distribution system. The OPCC for the recycled water distribution system will include the pipeline, pump station costs, storage costs, and the following additional costs:

- Mobilization
- Startup/Commissioning
- Project Administration & Management
- The OPCCs for the recommended system are as follows:



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Phase 1:	\$ 5,537,000
Phase 2:	\$12,693,000
Phase 3A:	\$14,541,000
Phase 3B:	\$13,763,000
Phase 4A:	\$ 4,134,000
Phase 4B:	\$ 4,098,000

The detailed estimates for each phase can be found in **Section 7**.

9.2.1 Cost Allocated to Water Pollution Control

Connection to the recycled water supply system detailed in this document will be performed by a Contractor that has been certified to construct/retrofit recycled water irrigation systems. The Contractor shall utilize Best Management Practices (BMPs) to mitigate storm water and runoff pollution during construction. Upon completion of the retrofit, overspray and runoff will be eliminated per the RWQCB NPDES permit with OCWD. As a result of these efforts, no costs will be allocated to water pollution control.

9.3 Pricing Policy for Recycled Water

The City of Santa Ana already has an established recycled water rate in order to sell the recycled water as part the expansion of their recycled water distribution system. The potable water and recycled water rates can be found in **Table 9-1** below. The cost charged to the customer is based on the number of water units, hundred cubic feet (hcf), used within a billing cycle.



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Table 9-1 City of Santa Ana Potable and Recycled Water Rates

ALL CUSTOMERS						
BASIC SERVICE CHARGE (\$/BI-MONTHLY) [*]						
METER SIZE	FY 16/17	INC./{DEC.} FROM PRIOR YEAR	FY 17/18	INC./{DEC.} FROM PRIOR YEAR	FY 18/19	INC./{DEC.} FROM PRIOR YEAR
5/8"	\$10.70	\$1.65	\$12.35	\$1.65	\$13.90	\$1.55
3/4"	\$23.25	\$3.60	\$26.80	\$3.55	\$30.20	\$3.40
1"	\$44.10	\$6.80	\$50.90	\$6.80	\$57.30	\$6.40
1.5"	\$69.15	\$10.65	\$79.85	\$10.70	\$89.85	\$10.00
2"	\$127.65	\$19.70	\$147.30	\$19.65	\$165.80	\$18.50
3"	\$211.15	\$32.55	\$243.70	\$32.55	\$274.30	\$30.60
4"	\$419.95	\$64.75	\$484.70	\$64.75	\$545.55	\$60.85
6"	\$670.50	\$103.40	\$773.90	\$103.40	\$871.05	\$97.15
[*]Multi-Family per unit charge	\$6.40	\$0.95	\$7.40	\$1.00	\$9.50	\$2.10
COMMODITY CHARGE (\$/HCF)						
TIERS	FY 16/17	INC./{DEC.} FROM PRIOR YEAR	FY 17/18	INC./{DEC.} FROM PRIOR YEAR	FY 18/19	INC./{DEC.} FROM PRIOR YEAR
Tier 1 (0-44 HCF)	\$2.81	\$0.01	\$2.82	\$0.01	\$2.83	\$0.01
Tier 2 (> 45 HCF)	\$3.37	\$0.01	\$3.38	\$0.02	\$3.40	\$0.01
Recycled Water	\$2.24	\$0.01	\$2.25	\$0.01	\$2.26	\$0.01

The recycled water rates are typically less than the potable water rates in order to provide an incentive for individual potential recycled water customers to connect to the recycled water system. However, the recycled water rates for the identified potential customers will depend on which option the respective City chooses to pay for the retrofits. For potential customers with separate irrigation and potable water systems, the retrofits will include disconnecting the irrigation system from the potable water service and connecting it to the recycled water service. Reduced pressure principle device (RPPD) backflow preventor will need to be installed on the potable service immediately downstream of the meter. For potential customers with irrigation systems tied to the potable water systems, the systems will have to be separated. In addition, hose bibs will need to be eliminated from the irrigation systems. For all the public customers, such as parks and schools, will have to post signs advising the public that recycled water is being used for irrigation. Parks, schools and other users with exposed drinking fountains near landscaped areas will have to provide shields to prevent recycled water from coming into contact with the drinking fountains.



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The City has three options to pay for the recycled water system retrofits:

1. The individual customer pays for the retrofit
2. The City pays for the retrofit, including engineering cost, construction and associated permits
3. The City pays for the retrofit and the customers pay the City back using the savings difference between the recycled water rate and the potable water rate.

9.4 Financial Analysis

A financial analysis was prepared for Phase 1 only that phase is within a 5-year to 8-year potential implementation cycle. The City would base the retrofit financing on a 20-year payback period, which other agencies have used in the past. The financial analysis presented in this report assumes that the City would pay for the retrofit and the customers pay the City back using the savings difference between the recycled water rate and the potable water rate. The phasing of the recycled water distribution system depends on various factors, such as the available funds from the City, grants or loans from the Metropolitan Water District of Southern California, State Water Resources Control Board Division of Financial Assistance or from the U.S. Bureau of Reclamation; inflation rates for energy, labor, recycled water revenue rates and the ability to sell the potable water offset through the use of recycled water. The following assumptions are being used in the financial analysis:

- Zero percent (0%) of the cost will be funded by grants;
- Labor costs are \$6,000/month and will use an annual inflation rate of 3%;
- Customers will pay the potable water revenue rate of \$2.81/hcf to \$3.37/hcf to pay the City of Santa Ana back for the capital cost.

Annual cost for the project were calculated using the following equation:

$$\text{Annual Cost} = \text{Annual Loan Amount} + \text{Annual Energy Cost} + \text{Annual Labor}$$

The cost and revenue of the Alternative 1 – Phase 1 is presented in graphical form as shown in **Figure 9-2**, shows the cost of the system and the revenue generated over 20 years. The graph shows that to pay off the recycled system would be over 20 years. It is recommended that the City seeks state and federal grant funding and continues charging the potable water revenue rate to the potential recycled water users.



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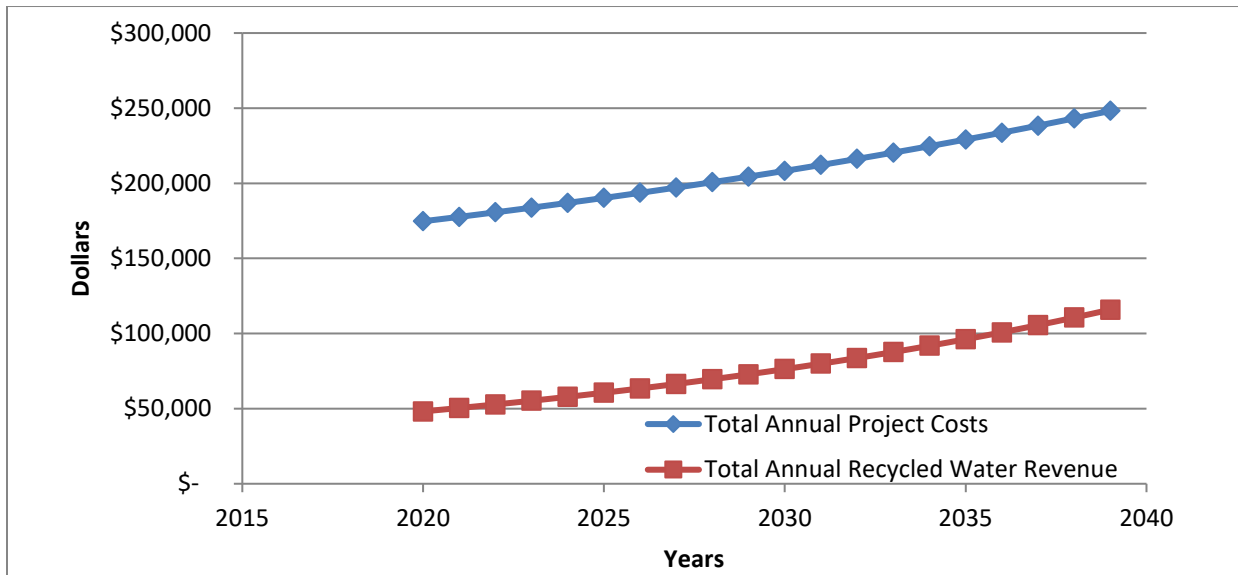


Figure 9-1 Phase 1 Recycled Water Cost versus Revenue over 20 years

The cost and revenue of the Phase 1 is presented in graphical form as shown in Figure 9-3, shows the cost of the system and the revenue generated over 20 years. The graph shows that to pay off the recycled system would be 9 years. It is recommended that the City of seeks state and federal grant funding and continues charging the potable water revenue rate to the potential recycled water users.

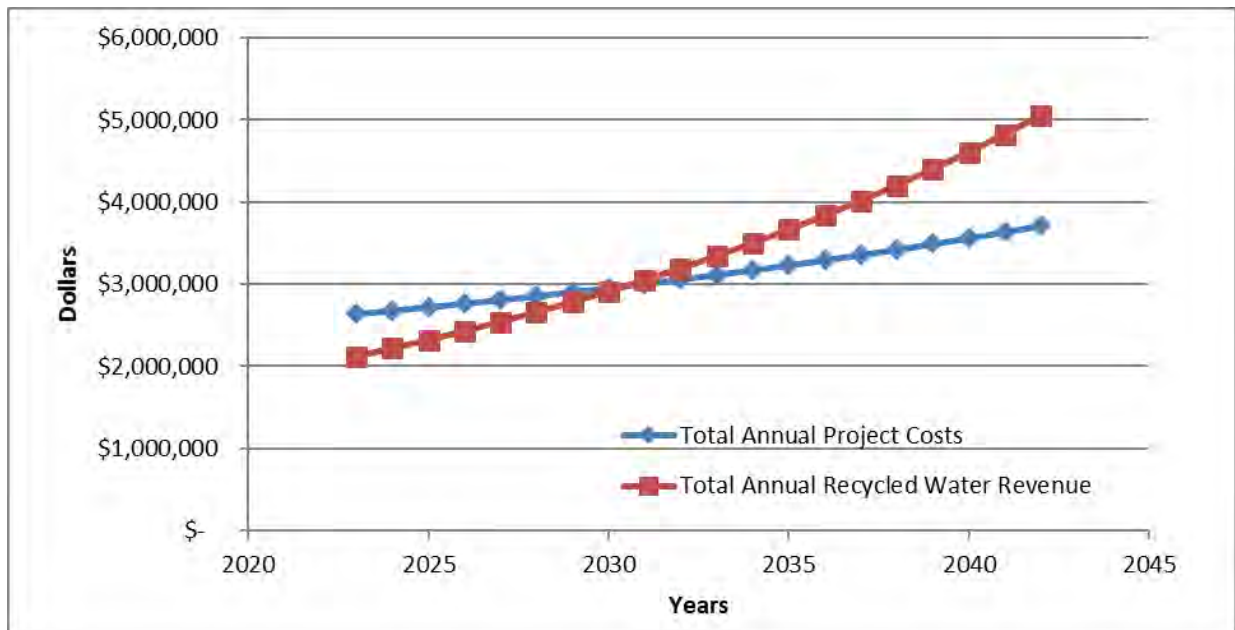


Figure 9-2 Phase 1 - Recycled Water Cost versus Revenue over 20 years



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9.4.1 Allocation of Costs to Users

Cost will be allocated to users in the following manner:

- 1) The user will pay for the system to be retrofitted to receive recycled water;
- 2) The cost to retrofit the system will be paid by the respective City; or
- 3) A combination of customer and City funding will be used to pay for the retrofit.

The potential customers that will be supplied recycled water from this project are both public/City facilities and private entities. Therefore, the cost to retrofit the public/City facilities will be addressed by the respective City. It is assumed that costs related to private users will be addressed by said users.

9.4.2 Sunk Costs and Indebtedness

All sunk costs and indebtedness associated with the recommended project relate to supplying the recycled water to the connection point. These costs pertain to other recycled water supply projects that have been previously implemented by OCWD for both the GAP and GWWP. As such there are no sunk costs nor indebtedness for the recommended project.

9.4.3 Sensitivity Analysis

The recommended alternative will connect an estimated 141 customers to the recycled water supply system detailed in this study. However, it is assumed that a portion of the planned customers will not connect to the system. As previously stated in **Sections 7 and 8**, the potential recycled water users consist of public/City facilities and private facilities. Of the 141 potential recipients of recycled water, 97 private facilities with the remaining as public/City facilities. It is assumed that 100% of the public/City facilities will connect to the system, and 30% of the private facilities will chose not to connect. Therefore, it is assumed that 112 of the 141 potential recycled users will connect to the planned system.

9.4.4 Market Assurances

A Mandatory Use Ordinance for the use of recycled water within the City of Santa Ana can be found in **Appendix G**.



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City of Santa Ana Recycled Water Master Plan
Potential Recycled Water Retrofit Sites by Customer Type

Site No.	Phase	Customer Name	Customer Address	Tax District	Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Domestic Water Annual Demand (BU/YR)	Potential Recycled Water Use (BU/YR)	Final Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Final Potential Recycled Water Demand (BU/YR)	Final Potential Recycled Water Demand (AFT/YR)	Average Daily Demand (ADD) GPM	Max Day Demand (MDD) GPM	Peak Hour Demand (PHD) GPM
1	1	FAR WEST MANAGEMENT CORP	1601 W MACARTHUR BLVD	APARTMENTS W/DUMPSTER	40%	47,536.00	19,014.40	90%	19,014.40	43.63	13.53	29.09	87.27
2	1	MAC ARTHUR VILLAGE	1040 W MACARTHUR BLVD	APARTMENTS W/DUMPSTER	40%	45,966.00	18,386.40	90%	18,386.40	42.19	13.08	28.13	84.39
3	2	FAIRVIEW VILLAS	801 S FAIRVIEW ST	APARTMENTS W/DUMPSTER	40%	74,282.00	29,712.80	20%	14,856.40	34.09	21.14	45.46	136.37
4	1	ON THE LK VERSAILLES	3700 S PLAZA DR	APARTMENTS W/DUMPSTER	40%	35,805.00	14,322.00	90%	14,322.00	32.86	12.74	27.39	82.17
5	1	SC VILLAS	1001 W MACARTHUR BLVD	APARTMENTS W/DUMPSTER	40%	29,605.00	11,842.00	90%	11,842.00	27.17	10.53	22.65	67.94
6	3	WARWICK SQUARE ASSOC INC	710 S LYON ST	APARTMENTS W/DUMPSTER	40%	49,598.00	19,839.20	20%	9,919.60	22.76	14.12	30.35	91.05
7	1	FAR WEST MANAGEMENT CORP	1601 W MACARTHUR BLVD	APARTMENTS W/DUMPSTER	40%	47,536.00	19,014.40	20%	9,507.20	21.81	13.53	29.09	87.27
8	1	PARK PLAZA II LTD	805 W STEVENS AVE	APARTMENTS W/DUMPSTER	40%	22,470.00	8,988.00	90%	8,988.00	20.62	7.99	17.19	51.56
9	1	ON THE LK VERSAILLES	3700 S PLAZA DR	APARTMENTS W/DUMPSTER	40%	35,805.00	14,322.00	25%	8,951.25	20.54	12.74	27.39	82.17
10	1	SOUTH COAST RACQUET CLUB	1101 W STEVENS AVE	APARTMENTS W/DUMPSTER	40%	20,220.00	8,088.00	90%	8,088.00	18.56	2.88	6.19	18.56
11	2	TOWN SQUARE OWNERS	601 W 1ST ST	APARTMENTS W/DUMPSTER	40%	39,705.00	15,882.00	20%	7,941.00	18.22	11.30	24.30	72.89
12	1	COURTYARD AT SC 192 ASSOC	3800 S FLOWER ST	APARTMENTS W/DUMPSTER	40%	17,502.00	7,000.80	90%	7,000.80	16.06	6.23	13.39	40.16
13	1	ST ALBANS HOA	3601 S BEAR ST	APARTMENTS W/DUMPSTER	40%	17,329.00	6,931.60	90%	6,931.60	15.90	4.93	10.60	31.81
14	4	BENTLEY PARKE APARTMENTS	3200 W 5TH ST	APARTMENTS W/DUMPSTER	40%	28,029.00	11,211.60	20%	5,605.80	12.86	7.98	17.15	51.46
15	3	REDWOODS HOMEOWNERS	1001 N MABURY ST	APARTMENTS W/DUMPSTER	40%	27,102.00	10,840.80	20%	5,420.40	12.44	7.71	16.59	49.76
16	4	VILLA VERDE APARTMENTS	4200 W 1ST ST	APARTMENTS W/DUMPSTER	40%	21,339.00	8,535.60	25%	5,334.75	12.24	7.59	16.32	48.97
17	3	BDP LAS FUENTES, LLC	727 S LYON ST	APARTMENTS W/DUMPSTER	40%	20,752.00	8,300.80	25%	5,188.00	11.90	7.38	15.87	47.62
18	3	LK DIANE/SATELLITE M	750 N PARK CENTER DR	APARTMENTS W/DUMPSTER	40%	25,730.00	10,292.00	20%	5,146.00	11.81	7.32	15.75	47.24
19	2	FAIRLANE GARDEN	631 S FAIRVIEW ST	APARTMENTS W/DUMPSTER	40%	25,461.00	10,184.40	20%	5,092.20	11.68	7.25	15.58	46.74
20	3	SADDLEBACK PARK VILL	521 S LYON ST	APARTMENTS W/DUMPSTER	40%	20,358.00	8,143.20	25%	5,089.50	11.68	7.24	15.57	46.72
21	1	NEW WOODSIDE VILLAGE	2521 W SUNFLOWER AVE	APARTMENTS W/DUMPSTER	40%	20,057.00	8,022.80	25%	5,014.25	11.51	7.14	15.34	46.03
22	2	LINC-BRISTOL ASSOCIATES	2901 N BRISTOL ST	APARTMENTS W/DUMPSTER	40%	25,057.00	10,022.80	20%	5,011.40	11.50	7.13	15.33	46.00
23	2	SOLARE APARTMENTS SA, LLC	2111 W 17TH ST	APARTMENTS W/DUMPSTER	40%	20,040.00	8,016.00	25%	5,010.00	11.50	7.13	15.33	45.99
24	4	STRATFORD MILE SQUARE RENTALS LLC	4800 W MCFADDEN AVE	APARTMENTS W/DUMPSTER	40%	19,231.00	7,692.40	25%	4,807.75	11.03	6.84	14.71	44.13
25	1	RP/ESSEX SKYLINE HOLDINGS, LLC	11 HUTTON CENTRE DR	APARTMENTS W/DUMPSTER	40%	22,971.00	9,188.40	20%	4,594.20	10.54	6.54	14.06	42.17
26	3	MONTEREY VILLAS MAINTENANCE ASSOCIA	1345 N CABRILLO PARK DR	APARTMENTS W/DUMPSTER	40%	21,039.00	8,415.60	20%	4,207.80	9.65	5.99	12.88	38.62
27	3	CABRILLO PARK HOA/ACT	1400 N CABRILLO PARK DR	APARTMENTS W/DUMPSTER	40%	21,029.00	8,411.60	20%	4,205.80	9.65	5.99	12.87	38.61
28	2	REGENCY VILLAS HOA	1602 N KING ST	APARTMENTS W/DUMPSTER	40%	16,591.00	6,636.40	25%	4,147.75	9.52	5.90	12.69	38.07
29	1	THE PEARTREE APTS	3401 S PLAZA DR	APARTMENTS W/DUMPSTER	40%	9,515.00	3,806.00	90%	3,806.00	8.73	3.39	7.28	21.84
30	1	THE MARKE OF SOUTH COAST METRO LLC	100 E MACARTHUR BLVD	APARTMENTS W/DUMPSTER	40%	15,132.00	6,052.80	25%	3,783.00	8.68	5.38	11.58	34.73
31	4	HARBOR POINTE APARTMENTS	1500 N HARBOR BLVD	APARTMENTS W/DUMPSTER	40%	15,092.00	6,036.80	25%	3,773.00	8.66	5.37	11.54	34.63
32	1	SO CO SPRING HOA	3600 S BEAR ST	APARTMENTS W/DUMPSTER	40%	9,124.00	3,649.60	90%	3,649.60	8.37	3.25	6.98	20.94
33	1	SOUTH COAST SPRINGS	3770 S BEAR ST	APARTMENTS W/DUMPSTER	40%	8,933.00	3,573.20	90%	3,573.20	8.20	3.18	6.83	20.50
34	2	PACIFICA GARDEN APTS LP	2833 N BRISTOL ST	APARTMENTS W/DUMPSTER	40%	13,527.00	5,410.80	25%	3,381.75	7.76	4.81	10.35	31.04
35	1	WOODLAKE HOA	2528 W MACARTHUR BLVD	APARTMENTS W/DUMPSTER	40%	8,025.00	3,210.00	90%	3,210.00	7.37	2.86	6.14	18.42
36	1	CHELSEA COURT APTS	3500 S GREENVILLE ST	APARTMENTS W/DUMPSTER	40%	7,918.00	3,167.20	90%	3,167.20	7.27	2.82	6.06	18.17
37	2	PACIFICA GARDEN APTS LP	2801 N BRISTOL ST	APARTMENTS W/DUMPSTER	40%	12,651.00	5,060.40	25%	3,162.75	7.26	4.50	9.68	29.03
38	2	CCHNC/FLOWER PARK PLAZA LP	901 W 1ST ST	APARTMENTS W/DUMPSTER	40%	11,741.00	4,696.40	25%	2,935.25	6.73	4.18	8.98	26.94
39	1	WOODLAKE HOA	2500 W MACARTHUR BLVD	APARTMENTS W/DUMPSTER	40%	6,883.00	2,753.20	90%	2,753.20	6.32	2.45	5.27	15.80
40	2	SHADOW WOOD	611 N BRISTOL ST	APARTMENTS W/DUMPSTER	40%	10,263.00	4,105.20	25%	2,565.75	5.89	3.65	7.85	23.55
41	3	THE MONTEREY APARTMENTS	1750 N SHERRY LN	APARTMENTS W/DUMPSTER	40%	10,028.00	4,011.20	25%	2,507.00	5.75	3.57	7.67	23.01
42	2	ISLANDER APTS	2724 N BRISTOL ST	APARTMENTS W/DUMPSTER	40%	9,719.00	3,887.60	25%	2,429.75	5.58	3.46	7.43	22.30
43	1	BRE PROPERTIES INC	3501 S MAIN ST	APARTMENTS W/DUMPSTER	40%	9,575.00	3,830.00	25%	2,393.75	5.49	3.41	7.32	21.97
44	1	THE PEARTREE APTS	3401 S PLAZA DR	APARTMENTS W/DUMPSTER	40%	9,515.00	3,806.00	25%	2,378.75	5.46	3.39	7.28	21.84
45	2	SANTA ANA SENIOR HOUSING L P	401 W 1ST ST	APARTMENTS W/DUMPSTER	40%	11,794.00	4,717.60	20%	2,358.80	5.41	3.36	7.22	21.65
46	4	SUNSET RIDGE INVESTMENT LP	1314 N HARBOR BLVD	APARTMENTS W/DUMPSTER	40%	9,255.00	3,702.00	25%	2,313.75	5.31	3.29	7.08	21.24

City of Santa Ana Recycled Water Master Plan
Potential Recycled Water Retrofit Sites by Customer Type

Site No.	Phase	Customer Name	Customer Address	Tax District	Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Domestic Water Annual Demand (BU/YR)	Potential Recycled Water Use (BU/YR)	Final Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Final Potential Recycled Water Demand (BU/YR)	Final Potential Recycled Water Demand (AFT/YR)	Average Daily Demand (ADD) GPM	Max Day Demand (MDD) GPM	Peak Hour Demand (PHD) GPM
47	4	CORSICAN FAMILY VILLAGE H O A	3927 W MCFADDEN AVE	APARTMENTS W/DUMPSTER	40%	9,134.00	3,653.60	25%	2,283.50	5.24	3.25	6.99	20.96
48	2	AG09-097	301 W 2ND ST	APARTMENTS W/DUMPSTER	40%	8,606.00	3,442.40	25%	2,151.50	4.94	3.06	6.58	19.75
49	2	PHILIP CASE	1610 N KING ST	APARTMENTS W/DUMPSTER	40%	8,458.00	3,383.20	25%	2,114.50	4.85	3.01	6.47	19.41
50	2	ADVANCED GROUP 01-76 FAIRVIEW APTS	2701 W MCFADDEN AVE	APARTMENTS W/DUMPSTER	40%	8,417.00	3,366.80	25%	2,104.25	4.83	3.00	6.44	19.32
51	1	WOODLAKE HOA	2528 W MACARTHUR BLVD	APARTMENTS W/DUMPSTER	40%	8,025.00	3,210.00	25%	2,006.25	4.60	2.86	6.14	18.42
52	1	CHELSEA COURT APTS	3500 S GREENVILLE ST	APARTMENTS W/DUMPSTER	40%	7,918.00	3,167.20	25%	1,979.50	4.54	2.82	6.06	18.17
53	3	VILLAGE MEADOWS PROP MGMT	801 S LYON ST	APARTMENTS W/DUMPSTER	40%	7,500.00	3,000.00	25%	1,875.00	4.30	2.67	5.74	17.21
										661.46			
1	4	CITY OF SANTA ANA MEDIAN	923 N HARBOR BLVD	CITY IRRIGATION	100%	2,029.00	2,029.00	100%	2,029.00	4.66	0.00	0.00	0.01
2	2	CITY OF SANTA ANA MEDIAN	1000 W MEMORY LN 1/2	CITY IRRIGATION	100%	1,109.00	1,109.00	100%	1,109.00	2.54	1.58	3.39	10.18
3	2	CITY OF SANTA ANA MEDIAN	1300 S FAIRVIEW ST 1/2	CITY IRRIGATION	100%	957.00	957.00	100%	957.00	2.20	0.00	0.00	0.01
4	4	CITY OF SANTA ANA MEDIAN	600 S HARBOR BLVD	CITY IRRIGATION	100%	927.00	927.00	100%	927.00	2.13	0.00	0.00	0.01
5	2	CITY OF SANTA ANA	601 N BRISTOL ST 3/4	CITY IRRIGATION	100%	860.00	860.00	100%	860.00	1.97	1.22	2.63	7.89
6	3	CITY OF SANTA ANA MEDIAN	400 W DYER RD 1/2	CITY IRRIGATION	100%	629.00	629.00	100%	629.00	1.44	0.00	0.01	0.02
7	2	CITY OF SANTA ANA MEDIAN	1219 E SANTA ANA BLVD	CITY IRRIGATION	100%	613.00	613.00	100%	613.00	1.41	0.87	1.88	5.63
8	3	CITY OF SANTA ANA MEDIAN	1751 E 4TH ST	CITY IRRIGATION	100%	538.00	538.00	100%	538.00	1.23	0.01	0.02	0.07
9	1	CITY OF SANTA ANA MEDIAN	2801 S HARBOR BLVD	CITY IRRIGATION	100%	495.00	495.00	100%	495.00	1.14	0.70	1.52	4.54
10	1	CITY OF SANTA ANA	2951 FLOWER ST 3/4	CITY IRRIGATION	100%	490.00	490.00	100%	490.00	1.12	0.70	1.50	4.50
11	3	CITY OF SANTA ANA MEDIAN	800 N CABRILLO PARK DR 1/2	CITY IRRIGATION	100%	463.00	463.00	100%	463.00	1.06	0.04	0.09	0.26
12	4	CITY OF SANTA ANA	630 S SUSAN ST 3/4	CITY IRRIGATION	100%	454.00	454.00	100%	454.00	1.04	0.65	1.39	4.17
13	3	CITY OF SANTA ANA MEDIAN	1000 N CABRILLO PARK DR 1/2	CITY IRRIGATION	100%	400.00	400.00	100%	400.00	0.92	0.10	0.22	0.65
14	1	CITY OF SANTA ANA MEDIAN	410 W MACARTHUR BLVD	CITY IRRIGATION	100%	395.00	395.00	100%	395.00	0.91	0.00	0.00	0.01
15	3	CITY OF SANTA ANA MEDIAN	2882 N MAIN ST 1/2	CITY IRRIGATION	100%	393.00	393.00	100%	393.00	0.90	0.56	1.20	3.61
16	2	CITY OF SANTA ANA PRCSA	1560 W MEMORY LN	CITY IRRIGATION	100%	378.00	378.00	100%	378.00	0.87	0.54	1.16	3.47
17	3	CITY OF SANTA ANA MEDIAN	1500 N CABRILLO PARK DR 1/2	CITY IRRIGATION	100%	366.00	366.00	100%	366.00	0.84	0.00	0.00	0.01
18	1	CITY OF SANTA ANA MEDIAN	4011 W SEGERSTROM AVE	CITY IRRIGATION	100%	348.00	348.00	100%	348.00	0.80	0.00	0.00	0.01
19	1	CITY OF SANTA ANA MEDIAN	3800 S PLAZA DR 1/2	CITY IRRIGATION	100%	312.00	312.00	100%	312.00	0.72	0.00	0.01	0.02
20	2	CITY OF SANTA ANA MEDIAN	1031 W 17TH ST	CITY IRRIGATION	100%	286.00	286.00	100%	286.00	0.66	0.00	0.00	0.01
21	3	CITY OF SANTA ANA MEDIAN	500 W DYER RD 1/2	CITY IRRIGATION	100%	232.00	232.00	100%	232.00	0.53	0.00	0.00	0.01
22	2	CITY OF SANTA ANA MEDIAN	1314 W 17TH ST	CITY IRRIGATION	100%	167.00	167.00	100%	167.00	0.38	0.00	0.00	0.01
23	2	CITY OF SANTA ANA MEDIAN	400 N FAIRVIEW ST 1/2	CITY IRRIGATION	100%	162.00	162.00	100%	162.00	0.37	0.23	0.50	1.49
24	2	CITY OF SANTA ANA WELL #33	921 W WALNUT ST	CITY IRRIGATION	100%	147.00	147.00	100%	147.00	0.34	0.21	0.45	1.35
25	1	CITY OF SANTA ANA	521 W MACARTHUR BLVD	CITY IRRIGATION	100%	143.00	143.00	100%	143.00	0.33	0.20	0.44	1.31
26	1	CITY OF SANTA ANA MEDIAN	300 E MACARTHUR BLVD 1/2	CITY IRRIGATION	100%	138.00	138.00	100%	138.00	0.32	0.20	0.42	1.27
27	2	CITY OF SANTA ANA PW MAINTENANCE	1631 N BRISTOL ST 3/4	CITY IRRIGATION	100%	113.00	113.00	100%	113.00	0.26	0.16	0.35	1.04
28	2	CITY OF SANTA ANA MEDIAN	200 N FAIRVIEW ST 1/2	CITY IRRIGATION	100%	112.00	112.00	100%	112.00	0.26	0.00	0.00	0.01
29	3	CITY OF SANTA ANA MEDIAN	2775 N MAIN ST	CITY IRRIGATION	100%	109.00	109.00	100%	109.00	0.25	0.00	0.00	0.01
30	3	CITY OF SANTA ANA MEDIAN	1704 E EDINGER AVE	CITY IRRIGATION	100%	92.00	92.00	100%	92.00	0.21	0.00	0.00	0.01
31	2	CITY OF SANTA ANA MEDIAN	924 N FLOWER ST 1/2	CITY IRRIGATION	100%	83.00	83.00	100%	83.00	0.19	0.00	0.00	0.01
32	1	CITY OF SANTA ANA	522 W MACARTHUR BLVD	CITY IRRIGATION	100%	79.00	79.00	100%	79.00	0.18	0.11	0.24	0.73
33	1	CITY OF SANTA ANA MEDIAN	601 E DYER RD	CITY IRRIGATION	100%	71.00	71.00	100%	71.00	0.16	0.00	0.00	0.01
34	2	CITY OF SANTA ANA MEDIAN	900 W 1ST ST 1/2	CITY IRRIGATION	100%	68.00	68.00	100%	68.00	0.16	0.10	0.21	0.62
35	2	CITY OF SANTA ANA MEDIAN	2800 W HIGHLAND AVE	CITY IRRIGATION	100%	68.00	68.00	100%	68.00	0.16	0.00	0.00	0.01
36	2	CITY OF SANTA ANA MEDIAN	2907 N BRISTOL ST 1/2	CITY IRRIGATION	100%	67.00	67.00	100%	67.00	0.15	0.00	0.01	0.02

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37	2	CITY OF SANTA ANA MEDIAN	2623 W 1ST ST	CITY IRRIGATION	100%	61.00	61.00	100%	61.00	0.14	0.00	0.00	0.01
38	3	CITY OF SANTA ANA	1640 E EDINGER AVE 1/2	CITY IRRIGATION	100%	52.00	52.00	100%	52.00	0.12	0.00	0.00	0.01
39	4	CITY OF SANTA ANA MEDIAN	3900 W 1ST ST 1/2	CITY IRRIGATION	100%	52.00	52.00	100%	52.00	0.12	0.00	0.00	0.01
40	2	CITY OF SANTA ANA MEDIAN	2489 N RIVERSIDE AVE 3/4	CITY IRRIGATION	100%	49.00	49.00	100%	49.00	0.11	0.00	0.00	0.01
41	3	CITY OF SANTA ANA MEDIAN	1600 E EDINGER AVE 1/2	CITY IRRIGATION	100%	46.00	46.00	100%	46.00	0.11	0.00	0.00	0.01
42	2	CITY OF SANTA ANA MEDIAN	2800 W WILLITS ST 1/2	CITY IRRIGATION	100%	44.00	44.00	100%	44.00	0.10	0.00	0.00	0.01
43	1	CITY OF SANTA ANA MEDIAN	900 W MACARTHUR BLVD 1/2	CITY IRRIGATION	100%	40.00	40.00	100%	40.00	0.09	0.06	0.12	0.37
44	2	CITY OF SANTA ANA MEDIAN	420 N BROADWAY ST 1/2	CITY IRRIGATION	100%	35.00	35.00	100%	35.00	0.08	0.00	0.00	0.01
45	2	CITY OF SANTA ANA ENTRY PRTL	1300 W PARK LN 1/2	CITY IRRIGATION	100%	32.00	32.00	100%	32.00	0.07	0.00	0.00	0.01
46	3	CITY OF SANTA ANA MEDIAN	1900 E 4TH ST 1/2	CITY IRRIGATION	100%	20.00	20.00	100%	20.00	0.05	0.00	0.00	0.01
47	2	CITY OF SANTA ANA MEDIAN	800 S FAIRVIEW ST 1/2	CITY IRRIGATION	100%	19.00	19.00	100%	19.00	0.04	0.03	0.06	0.17
48	2	CITY OF SANTA ANA MEDIAN	200 N BROADWAY ST 1/2	CITY IRRIGATION	100%	17.00	17.00	100%	17.00	0.04	0.02	0.05	0.16
49	2	CITY OF SANTA ANA ENTRY PRTL	201 S CYPRESS AVE	CITY IRRIGATION	100%	17.00	17.00	100%	17.00	0.04	0.02	0.05	0.16
50	2	CITY OF SANTA ANA DIVIDER	1615 N LOUISE ST	CITY IRRIGATION	100%	16.00	16.00	100%	16.00	0.04	0.02	0.05	0.15
51	2	CITY OF SANTA ANA MEDIAN	600 W 1ST ST 1/2	CITY IRRIGATION	100%	16.00	16.00	100%	16.00	0.04	0.02	0.05	0.15
52	4	CITY OF SANTA ANA MEDIAN	3610 W MCFADDEN AVE	CITY IRRIGATION	100%	11.00	11.00	100%	11.00	0.03	0.02	0.03	0.10
53	2	CITY OF SANTA ANA MEDIAN	500 S FAIRVIEW ST 1/2	CITY IRRIGATION	100%	6.00	6.00	100%	6.00	0.01	0.01	0.02	0.06
54	4	CITY OF SANTA ANA ENTRY PRTL	3710 W WASHINGTON AVE	CITY IRRIGATION	100%	4.00	4.00	100%	4.00	0.01	0.01	0.01	0.04
										34.03			
1	2	CITY OF SANTA ANA POLICE STA	60 CIVIC CENTER PLZ	CITY OWNED PROPERTY	90%	23,593.00	21,233.70	40%	9,437.20	21.65	13.43	28.88	86.63
2	2	CITY OF SANTA ANA CITY HALL	600 W CIVIC CENTER DR W	CITY OWNED PROPERTY	90%	8,573.00	7,715.70	40%	3,429.20	7.87	4.88	10.49	31.48
3	2	STADIUM PARKING STRUCTURE	1020 W CIVIC CENTER DR W	CITY OWNED PROPERTY	90%	1,984.00	1,785.60	40%	793.60	1.82	1.13	2.43	7.29
4	2	CITY OF SANTA ANA ROSS ANNEX	24 CIVIC CENTER PLZ	CITY OWNED PROPERTY	90%	1,479.00	1,331.10	40%	591.60	1.36	0.84	1.81	5.43
5	2	CITY OF SANTA ANA LIBRARY	26 CIVIC CENTER PLZ	CITY OWNED PROPERTY	90%	811.00	729.90	40%	324.40	0.74	0.46	0.99	2.98
6	2	CITY OF SANTA ANA MEDIAN	1147 W 17TH ST	CITY OWNED PROPERTY	90%	540.00	486.00	40%	216.00	0.50	0.00	0.00	0.00
7	2	OCFA #71	1029 W 17TH ST	CITY OWNED PROPERTY	90%	485.00	436.50	40%	194.00	0.45	0.28	0.59	1.78
8	2	CITY OF SANTA ANA MEDIAN	500 N FAIRVIEW ST 1/2	CITY OWNED PROPERTY	90%	266.00	239.40	40%	106.40	0.24	0.00	0.00	0.00
9	4	CITY OF SANTA ANA NEWHOPE LIB	122 N NEWHOPE ST	CITY OWNED PROPERTY	90%	156.00	140.40	40%	62.40	0.14	0.09	0.19	0.57
10	3	OCFA #72	1688 E 4TH ST	CITY OWNED PROPERTY	90%	143.00	128.70	40%	57.20	0.13	0.08	0.18	0.53
11	3	ALTON BIKE TRAIL E OF FLOWER	214 E ADAMS ST	CITY OWNED PROPERTY	90%	43.00	43.00	40%	43.00	0.10	0.00	0.00	0.00
12	2	CITY OF SANTA ANA	690 W CIVIC CENTER DR W	CITY OWNED PROPERTY	90%	48.00	43.20	40%	19.20	0.04	0.03	0.06	0.18
13	2	CITY OF SANTA ANA YMCA BLDG	205 W CIVIC CENTER DR W	CITY OWNED PROPERTY	90%	43.00	38.70	40%	17.20	0.04	0.00	0.00	0.00
14	2	COMMUNITY DEVELOPMENT	209 W CIVIC CENTER DR W	CITY OWNED PROPERTY	90%	43.00	38.70	40%	17.20	0.04	0.00	0.00	0.00
15	2	CITY OF SANTA ANA DOWNTOWN MAINTENA	215 W 2ND ST	CITY OWNED PROPERTY	90%	6.00	5.40	40%	2.40	0.01	0.00	0.01	0.02
										35.13			
1	1	CENTENNIAL PARK	3000 W EDINGER AVE	CITY PARK	90%	24,430.00	21,987.00	90%	21,987.00	50.45	31.29	67.28	201.82
2	3	SANTA ANA ZOO	1721 E CHESTNUT AVE	CITY PARK	90%	11,464.00	10,317.60	90%	10,317.60	23.67	14.68	31.57	94.71
3	3	PORTOLA PARK	1700 E SANTA CLARA AVE	CITY PARK	90%	7,916.00	7,124.40	90%	7,124.40	16.35	10.14	21.80	65.40
4	2	COUNTY JAIL IRRIGATION	1029 W SANTA ANA BLVD	CITY PARK	90%	7,184.00	6,465.60	90%	6,465.60	14.84	9.20	19.78	59.35
5	4	CAMPENSINO PARK	3311 W 5TH ST	CITY PARK	90%	6,713.00	6,041.70	90%	6,041.70	13.86	8.60	18.49	55.46
6	1	LILLIE KING PARK	500 W ALTON AVE	CITY PARK	90%	6,431.00	5,787.90	90%	5,787.90	13.28	8.24	17.71	53.13
7	3	CABRILLO PARK	1820 E FRUIT ST	CITY PARK	90%	5,496.00	4,946.40	90%	4,946.40	11.35	7.04	15.14	45.40

City of Santa Ana Recycled Water Master Plan
Potential Recycled Water Retrofit Sites by Customer Type

Site No.	Phase	Customer Name	Customer Address	Tax District	Estimated Percentage of Domestic Water Demand Covertible to Recycled Water	Domestic Water Annual Demand (BU/YR)	Potential Recycled Water Use (BU/YR)	Final Estimated Percentage of Domestic Water Demand Covertible to Recycled Water	Final Potential Recycled Water Demand (BU/YR)	Final Potential Recycled Water Demand (AFT/YR)	Average Daily Demand (ADD) GPM	Max Day Demand (MDD) GPM	Peak Hour Demand (PHD) GPM
8	1	THORNTON PARK	1801 W SEGERSTROM AVE	CITY PARK	90%	5,341.00	4,806.90	90%	4,806.90	11.03	6.84	14.71	44.12
9	4	HERITAGE PARK	4817 W CAMILLE ST	CITY PARK	90%	4,947.00	4,452.30	90%	4,452.30	10.22	6.34	13.62	40.87
10	1	SANDPOINTE PARK	3700 S BIRCH ST	CITY PARK	90%	4,691.00	4,221.90	90%	4,221.90	9.69	6.01	12.92	38.75
11	4	ROSITA PARK	4600 W HAZARD AVE	CITY PARK	90%	4,542.00	4,087.80	90%	4,087.80	9.38	5.82	12.51	37.52
12	3	DELHI PARK	505 E CENTRAL AVE	CITY PARK	90%	3,848.00	3,463.20	90%	3,463.20	7.95	4.93	10.60	31.79
13	3	MABURY PARK	1801 E FRUIT ST	CITY PARK	90%	3,707.00	3,336.30	90%	3,336.30	7.66	4.75	10.21	30.63
14	2	MORRISON PARK	2801 N WESTWOOD AVE	CITY PARK	90%	3,504.00	3,153.60	90%	3,153.60	7.24	4.49	9.65	28.95
15	3	MABURY PARK	1301 N MABURY ST	CITY PARK	90%	2,638.00	2,374.20	90%	2,374.20	5.45	3.38	7.26	21.79
16	2	BIRCH PARK	210 N BIRCH ST	CITY PARK	90%	2,300.00	2,070.00	90%	2,070.00	4.75	2.95	6.33	19.00
17	3	DELHI PARK	2314 S HALLADAY ST	CITY PARK	90%	1,987.00	1,788.30	90%	1,788.30	4.10	2.55	5.47	16.42
18	2	SASSCER PARK	400 N ROSS ST	CITY PARK	90%	1,506.00	1,355.40	90%	1,355.40	3.11	1.93	4.15	12.44
19	2	FLOWER ST PARK	902 W 3RD ST	CITY PARK	90%	1,447.00	1,302.30	90%	1,302.30	2.99	1.85	3.99	11.95
20	2	STADIUM	907 W 6TH ST	CITY PARK	90%	1,341.00	1,206.90	90%	1,206.90	2.77	1.72	3.69	11.08
21	3	CABRILLO TENNIS CENTER	721 N SHERRY LN	CITY PARK	90%	1,281.00	1,152.90	90%	1,152.90	2.65	1.64	3.53	10.58
22	1	CENTENNIAL PARK	3000 W EDINGER AVE	CITY PARK	90%	1,161.11	1,045.00	90%	1,045.00	2.40	1.49	3.20	9.59
23	2	COURTHOUSE IRRIGATION	209 W SANTA ANA BLVD	CITY PARK	90%	965.00	868.50	90%	868.50	1.99	1.24	2.66	7.97
24	3	BIKE TRAIL	322 E CENTRAL AVE	CITY PARK	90%	861.00	774.90	90%	774.90	1.78	1.10	2.37	7.11
25	3	SANTIAGO PARK	2535 N MAIN ST	CITY PARK	90%	672.00	604.80	90%	604.80	1.39	0.86	1.85	5.55
26	3	PRENTICE PARK	1700 E 1ST ST	CITY PARK	90%	605.00	544.50	90%	544.50	1.25	0.78	1.67	5.00
27	2	CITY OF SANTA ANA CRTHSE IRRI	631 N BROADWAY ST	CITY PARK	90%	526.00	473.40	90%	473.40	1.09	0.67	1.45	4.35
28	1	PASEO PARK	3630 S VAN NESS AVE	CITY PARK	90%	261.00	234.90	90%	234.90	0.54	0.33	0.72	2.16
29	1	ADAMS PARK	2302 S RAITT ST	CITY PARK	90%	156.00	140.40	90%	140.40	0.32	0.20	0.43	1.29
30	1	CENTENNIAL PARK SOCCER CNCES	3000 W EDINGER AVE	CITY PARK	90%	141.00	126.90	90%	126.90	0.29	0.18	0.39	1.17
31	2	CITY OF SANTA ANA MEDIAN	203 W CIVIC CENTER DR W	CITY PARK	90%	103.00	92.70	90%	92.70	0.21	0.13	0.28	0.85
32	2	STADIUM PARKING STRUCTURE	1020 W CIVIC CENTER DR W	CITY PARK	90%	81.00	72.90	90%	72.90	0.17	0.10	0.22	0.67
33	1	BOMO KORAL PARK	930 W MACARTHUR BLVD	CITY PARK	90%	2.00	1.80	90%	1.80	0.00	0.00	0.01	0.02
										244.19			
1	4	1ST STREET CARWASH, LP	4426 W 1ST ST	COMMERCIAL PROPERTY	50%	8,178.00	4,089.00	90%	7,360.20	16.89	10.48	22.52	67.56
1	1	POWER CIRCUITS INC	2640 S HARBOR BLVD	COMMERCIAL W/DUMPSTER	50%	25,625.00	12,812.50	50%	12,812.50	29.40	18.23	39.20	117.61
2	1	BRE/OC GRIFFIN LLC	5 HUTTON CENTRE DR	COMMERCIAL W/DUMPSTER	50%	17,016.00	8,508.00	50%	8,508.00	19.52	12.11	26.03	78.10
3	1	ROBINSON PHARMA INC	3330 S HARBOR BLVD	COMMERCIAL W/DUMPSTER	50%	15,801.00	7,900.50	50%	7,900.50	18.13	11.24	24.17	72.52
4	2	ARTHUR DEMIRCHYAN	202 E 1ST ST	COMMERCIAL W/DUMPSTER	50%	12,408.00	6,204.00	50%	6,204.00	14.23	8.83	18.98	56.95
5	3	AGNL ANTENNA LP	1801 E ST ANDREW PL	COMMERCIAL W/DUMPSTER	50%	10,994.00	5,497.00	50%	5,497.00	12.61	7.82	16.82	50.46
6	1	LAKE CENTER BUS PK OWN ASSOC	3500 W LAKE CENTER DR	COMMERCIAL W/DUMPSTER	50%	10,700.00	5,350.00	50%	5,350.00	12.28	7.61	16.37	49.11
7	1	PACIFICARE HEALTH SYSTEMS CORP	3120 W LAKE CENTER DR	COMMERCIAL W/DUMPSTER	50%	10,169.00	5,084.50	50%	5,084.50	11.67	7.24	15.56	46.67
8	1	PACIFICARE HEALTH SYSTEMS CORP	3120 W LAKE CENTER DR	COMMERCIAL W/DUMPSTER	50%	10,169.00	5,084.50	50%	5,084.50	11.67	7.24	15.56	46.67
9	1	U S POSTAL SERVICE	3101 W SUNFLOWER AVE	COMMERCIAL W/DUMPSTER	50%	9,456.00	4,728.00	50%	4,728.00	10.85	6.73	14.47	43.40
10	3	WEST FLAGER, LLC DBA CITY PLACE	2771 N MAIN ST 3/4	COMMERCIAL W/DUMPSTER	50%	8,008.00	4,004.00	50%	4,004.00	9.19	5.70	12.25	36.75
11	3	ALPINEFRESH USA, INC.	2020 S HATHAWAY ST	COMMERCIAL W/DUMPSTER	50%	7,525.00	3,762.50	50%	3,762.50	8.63	5.36	11.51	34.54
12	1	LAKESIDE PARTNERS HUTTON LLC	4 HUTTON CENTRE DR	COMMERCIAL W/DUMPSTER	50%	7,262.00	3,631.00	50%	3,631.00	8.33	5.17	11.11	33.33
13	1	ICON OWNER POOL 1 LA BUS. PARKS, LL	3601 W MACARTHUR BLVD	COMMERCIAL W/DUMPSTER	50%	6,370.00	3,185.00	50%	3,185.00	7.31	4.53	9.75	29.24

City of Santa Ana Recycled Water Master Plan
Potential Recycled Water Retrofit Sites by Customer Type

Site No.	Phase	Customer Name	Customer Address	Tax District	Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Domestic Water Annual Demand (BU/YR)	Potential Recycled Water Use (BU/YR)	Final Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Final Potential Recycled Water Demand (BU/YR)	Final Potential Recycled Water Demand (AFT/YR)	Average Daily Demand (ADD) GPM	Max Day Demand (MDD) GPM	Peak Hour Demand (PHD) GPM
14	3	SAVY S SUOS	216 E WARNER AVE	COMMERCIAL W/DUMPSTER	50%	6,130.00	3,065.00	50%	3,065.00	7.03	4.36	9.38	28.13
15	2	FAIRVIEW EXPRESS PARTNERS, L.P.	1003 S FAIRVIEW ST	COMMERCIAL W/DUMPSTER	50%	6,045.00	3,022.50	50%	3,022.50	6.94	4.30	9.25	27.74
16	3	PALMDALE AVENUE S LLC	1730 E 17TH ST	COMMERCIAL W/DUMPSTER	50%	5,906.00	2,953.00	50%	2,953.00	6.78	4.20	9.04	27.11
17	1	BRE/OC MACARTHUR, LLC	1 E MACARTHUR PL	COMMERCIAL W/DUMPSTER	50%	5,847.00	2,923.50	50%	2,923.50	6.71	4.16	8.95	26.84
18	4	FIRST NEWPORT PLAZA LLC	4401 W 1ST ST	COMMERCIAL W/DUMPSTER	50%	5,619.00	2,809.50	50%	2,809.50	6.45	4.00	8.60	25.79
19	3	1701 E EDINGER LLC	1701 E EDINGER AVE	COMMERCIAL W/DUMPSTER	50%	5,587.00	2,793.50	50%	2,793.50	6.41	3.98	8.55	25.64
20	1	CODAN MEDLON INC	3501 W SUNFLOWER AVE	COMMERCIAL W/DUMPSTER	50%	5,536.00	2,768.00	50%	2,768.00	6.35	3.94	8.47	25.41
21	1	OCEANSIDE INTERNATIONAL PROPERTIES	2901 W MACARTHUR BLVD	COMMERCIAL W/DUMPSTER	50%	5,520.00	2,760.00	50%	2,760.00	6.33	3.93	8.45	25.34
22	1	OCEANSIDE INTERNATIONAL PROPERTIES	2901 W MACARTHUR BLVD	COMMERCIAL W/DUMPSTER	50%	5,520.00	2,760.00	50%	2,760.00	6.33	3.93	8.45	25.34
23	1	BANC OF CALIFORNIA	3 IMPERIAL PROMENADE	COMMERCIAL W/DUMPSTER	50%	5,229.00	2,614.50	50%	2,614.50	6.00	3.72	8.00	24.00
24	3	FABCON CORP	1800 E ST ANDREW PL	COMMERCIAL W/DUMPSTER	50%	4,956.00	2,478.00	50%	2,478.00	5.69	3.53	7.58	22.75
25	1	SIGNATURE PARTY RENTALS	3100 S SUSAN ST	COMMERCIAL W/DUMPSTER	50%	4,782.00	2,391.00	50%	2,391.00	5.49	3.40	7.32	21.95
26	1	MDV PARTNERS	3001 S HARBOR BLVD	COMMERCIAL W/DUMPSTER	50%	4,406.00	2,203.00	50%	2,203.00	5.05	3.14	6.74	20.22
27	3	MAINPLACE SHOPPINGTOWN, LLC	2800 N MAIN ST	COMMERCIAL W/DUMPSTER	50%	21,700.00	10,850.00	10%	2,170.00	4.98	3.09	6.64	19.92
28	1	CYPRESS 3HC, LLC	3 HUTTON CENTRE DR	COMMERCIAL W/DUMPSTER	50%	4,230.00	2,115.00	50%	2,115.00	4.85	3.01	6.47	19.41
29	3	CENTURION PARTNERS LLC	1928 S GRAND AVE	COMMERCIAL W/DUMPSTER	50%	4,091.00	2,045.50	50%	2,045.50	4.69	2.91	6.26	18.78
30	2	THOMAS A SCIMECA	2220 W CAPE COD WAY	COMMERCIAL W/DUMPSTER	50%	4,062.00	2,031.00	50%	2,031.00	4.66	2.89	6.21	18.64
31	1	BEHR PROCESS CORP	3500 W SEGERSTROM AVE	COMMERCIAL W/DUMPSTER	50%	3,999.00	1,999.50	50%	1,999.50	4.59	2.85	6.12	18.35
32	3	LYON ST TRUST U T D	1640 E 1ST ST	COMMERCIAL W/DUMPSTER	50%	3,948.00	1,974.00	50%	1,974.00	4.53	2.81	6.04	18.12
33	3	BOYD SANTA ANA, LLC	1750 E 4TH ST	COMMERCIAL W/DUMPSTER	50%	3,861.00	1,930.50	50%	1,930.50	4.43	2.75	5.91	17.72
34	1	FIRST AMERICAN FINANCIAL CORP	5 E FIRST AMERICAN WAY	COMMERCIAL W/DUMPSTER	50%	3,661.00	1,830.50	50%	1,830.50	4.20	2.61	5.60	16.80
35	3	BULLOCKS SANTA ANA	2800 N MAIN ST	COMMERCIAL W/DUMPSTER	50%	3,652.00	1,826.00	50%	1,826.00	4.19	2.60	5.59	16.76
36	2	GOODWILL INDUSTRIES	410 N FAIRVIEW ST	COMMERCIAL W/DUMPSTER	50%	3,552.00	1,776.00	50%	1,776.00	4.07	2.53	5.43	16.30
37	1	WC SUNFLOWER OPS LLC	3730 S GREENVILLE ST	COMMERCIAL W/DUMPSTER	50%	3,536.00	1,768.00	50%	1,768.00	4.06	2.52	5.41	16.23
38	1	WC SUNFLOWER OPS LLC	3730 S GREENVILLE ST	COMMERCIAL W/DUMPSTER	50%	3,536.00	1,768.00	50%	1,768.00	4.06	2.52	5.41	16.23
39	2	CF SANTAANA LLC	801 W CIVIC CENTER DR	COMMERCIAL W/DUMPSTER	50%	3,512.00	1,756.00	50%	1,756.00	4.03	2.50	5.37	16.12
										312.70			
1	2	COUNTY OF ORANGE	550 N FLOWER ST	GOVERNMENT	90%	134,476.00	121,028.40	40%	53,790.40	123.42	76.55	164.59	493.75
2	2	COUNTY OF ORANGE	525 N FLOWER ST	GOVERNMENT	90%	50,702.00	45,631.80	40%	20,280.80	46.53	28.86	62.05	186.16
3	2	COUNTY OF ORANGE	511 N FLOWER ST	GOVERNMENT	90%	22,073.00	19,865.70	40%	8,829.20	20.26	12.57	27.02	81.05
4	2	COUNTY OF ORANGE	3102 N HESPERIAN ST	GOVERNMENT	90%	10,654.00	9,588.60	40%	4,261.60	9.78	6.07	13.04	39.12
5	3	COUNTY OF ORANGE	1400 S GRAND AVE	GOVERNMENT	90%	8,018.00	7,216.20	40%	3,207.20	7.36	4.56	9.81	29.44
6	2	COUNTY OF ORANGE	700 W CIVIC CENTER DR W	GOVERNMENT	90%	7,954.00	7,158.60	40%	3,181.60	7.30	4.53	9.74	29.21
7	2	RONALD REAGAN FED COURTHOUSE	411 W 4TH ST	GOVERNMENT	90%	4,160.00	3,744.00	40%	1,664.00	3.82	2.37	5.09	15.27
8	3	COUNTY OF ORANGE	1300 S GRAND AVE	GOVERNMENT	90%	3,647.00	3,282.30	40%	1,458.80	3.35	2.08	4.46	13.39
9	2	COUNTY OF ORANGE	1725 W 17TH ST	GOVERNMENT	90%	2,992.00	2,692.80	40%	1,196.80	2.75	1.70	3.66	10.99
10	2	COUNTY OF ORANGE	400 W SANTA ANA BLVD	GOVERNMENT	90%	2,856.00	2,570.40	40%	1,142.40	2.62	1.63	3.50	10.49
11	2	COUNTY OF ORANGE	630 N BROADWAY ST	GOVERNMENT	90%	2,746.00	2,471.40	40%	1,098.40	2.52	1.56	3.36	10.08
12	2	COUNTY OF ORANGE	300 N FLOWER ST	GOVERNMENT	90%	2,416.00	2,174.40	40%	966.40	2.22	1.38	2.96	8.87
13	2	COUNTY OF ORANGE	320 N FLOWER ST	GOVERNMENT	90%	2,375.00	2,137.50	40%	950.00	2.18	1.35	2.91	8.72
14	2	ADMINISTRATIVE OFFICE OF THE COURT	601 W SANTA ANA BLVD	GOVERNMENT	90%	2,362.00	2,125.80	40%	944.80	2.17	1.35	2.89	8.67
15	3	COUNTY OF ORANGE	1501 E ST ANDREW PL	GOVERNMENT	90%	1,708.00	1,537.20	40%	683.20	1.57	0.97	2.09	6.27
16	2	DEPT GEN SER B & G	28 CIVIC CENTER PLZ	GOVERNMENT	90%	1,326.00	1,193.40	40%	530.40	1.22	0.76	1.62	4.87
17	2	COUNTY OF ORANGE	333 W SANTA ANA BLVD	GOVERNMENT	90%	1,211.00	1,089.90	40%	484.40	1.11	0.69	1.48	4.45

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18	2	COUNTY OF ORANGE	1729 W 17TH ST	GOVERNMENT	90%	1,124.00	1,011.60	40%	449.60	1.03	0.64	1.38	4.13
19	2	COUNTY OF ORANGE	611 N BROADWAY ST	GOVERNMENT	90%	578.00	520.20	40%	231.20	0.53	0.33	0.71	2.12
20	1	OCFA #76	950 W MACARTHUR BLVD	GOVERNMENT	90%	253.00	227.70	90%	227.70	0.52	0.14	0.31	0.93
21	3	OCFA #79	1320 E WARNER AVE	GOVERNMENT	90%	538.00	484.20	40%	215.20	0.49	0.31	0.66	1.98
22	2	COUNTY OF ORANGE	515 N FLOWER ST	GOVERNMENT	90%	448.00	403.20	40%	179.20	0.41	0.26	0.55	1.65
23	2	OCFA #75	120 W WALNUT ST	GOVERNMENT	90%	409.00	368.10	40%	163.60	0.38	0.23	0.50	1.50
24	2	COUNTY OF ORANGE	645 N ROSS ST	GOVERNMENT	90%	317.00	285.30	40%	126.80	0.29	0.18	0.39	1.16
25	2	COUNTY OF ORANGE	1071 W SANTA ANA BLVD	GOVERNMENT	90%	310.00	279.00	40%	124.00	0.28	0.18	0.38	1.14
26	1	OCFA #76	950 W MACARTHUR BLVD	GOVERNMENT	90%	253.00	227.70	40%	101.20	0.23	0.14	0.31	0.93
27	3	MILITARY DEPT	612 E WARNER AVE	GOVERNMENT	90%	186.00	167.40	40%	74.40	0.17	0.11	0.23	0.68
28	2	COUNTY OF ORANGE	601 N ROSS ST	GOVERNMENT	90%	88.00	79.20	40%	35.20	0.08	0.05	0.11	0.32
										244.59			
1	1	CHROMA SYSTEMS	3201 S SUSAN ST	INDUS/DUMPT	50%	149,667.00	74,833.50	50%	74,833.50	171.70	106.50	228.97	686.91
2	1	POWER CIRCUITS INC	2645 S CRODDY WAY	INDUS/DUMPT	50%	54,101.00	27,050.50	50%	27,050.50	62.07	38.50	82.77	248.30
3	1	PIONEER CIRCUITS INC	3010 S SHANNON ST	INDUS/DUMPT	50%	14,467.00	7,233.50	50%	7,233.50	16.60	10.29	22.13	66.40
4	1	DANCO METAL SURF	401 W ROWLAND AVE	INDUS/DUMPT	50%	12,604.00	6,302.00	50%	6,302.00	14.46	8.97	19.28	57.85
5	3	L & N COSTUM SERVICES	1602 E EDINGER AVE	INDUS/DUMPT	50%	11,666.00	5,833.00	50%	5,833.00	13.38	8.30	17.85	53.54
6	1	SPS TECHNOLOGIES	2701 S HARBOR BLVD	INDUS/DUMPT	50%	9,255.00	4,627.50	50%	4,627.50	10.62	6.59	14.16	42.48
7	3	EMBEE PROCESSING, INC	2148 S HATHAWAY ST	INDUS/DUMPT	50%	8,633.00	4,316.50	50%	4,316.50	9.90	6.14	13.21	39.62
8	3	ACTIVE PLATING INC	1411 E POMONA ST	INDUS/DUMPT	50%	6,253.00	3,126.50	50%	3,126.50	7.17	4.45	9.57	28.70
9	3	EMBEE PROCESSING, INC.	2144 S HATHAWAY ST	INDUS/DUMPT	50%	5,950.00	2,975.00	50%	2,975.00	6.83	4.23	9.10	27.31
10	2	ZAROO EXPRESS SANTA ANA, LLC	1205 W 17TH ST	INDUS/DUMPT	50%	5,801.00	2,900.50	50%	2,900.50	6.66	4.13	8.88	26.62
11	3	ADVANCE MEDICAL OPTICS	1700 E ST ANDREW PL	INDUS/DUMPT	50%	4,652.00	2,326.00	50%	2,326.00	5.34	3.31	7.12	21.35
12	3	HOLLIDAY ROCK COMPANY, INC	2130 S GRAND AVE	INDUS/DUMPT	50%	4,531.00	2,265.50	50%	2,265.50	5.20	3.22	6.93	20.80
										329.92			
1	4	WILLOWICK GOLF COURSE		IRRIGATION	100%	87,120.05	87,120.05	100%	87,120.05	199.90	123.98	266.57	799.69
2	4	RIVER VIEW GOLF COURSE		IRRIGATION	100%	79,714.85	79,714.85	100%	79,714.85	182.90	113.45	243.91	731.72
3	2	CALTRANS	3023 N HESPERIAN ST	IRRIGATION	100%	7,957.00	7,957.00	100%	7,957.00	18.26	11.32	24.35	73.04
4	1	FIRST AMERICAN FINANCIAL CORP	3 E FIRST AMERICAN WAY	IRRIGATION	100%	6,369.00	6,369.00	100%	6,369.00	14.61	9.06	19.49	58.46
5	3	RED ROOF INNS INC	2600 N MAIN ST	IRRIGATION	100%	5,623.00	5,623.00	100%	5,623.00	12.90	8.00	17.21	51.62
6	1	FAR WEST MANAGEMENT CORP	3627 S ASPEN VILLAGE WAY	IRRIGATION	100%	4,471.00	4,471.00	100%	4,471.00	10.26	6.36	13.68	41.04
7	1	BRE CA OFFICE OWNER LLC	3607 S HARBOR BLVD	IRRIGATION	100%	4,057.00	4,057.00	100%	4,057.00	9.31	5.77	12.41	37.24
8	1	LAKE CENTER ASSOC	3401 W SUNFLOWER AVE	IRRIGATION	100%	3,890.00	3,890.00	100%	3,890.00	8.93	5.54	11.90	35.71
9	1	ARMSTRONG RANCH	3328 S SHEFFIELD RD	IRRIGATION	100%	3,527.00	3,527.00	100%	3,527.00	8.09	5.02	10.79	32.38
10	1	METRO TOWN SQUARE IRRIGATION	3660 S BRISTOL ST	IRRIGATION	100%	3,342.00	3,342.00	100%	3,342.00	7.67	4.76	10.23	30.68
11	3	PARKCENTER MGM	1273 N CABRILLO PARK DR	IRRIGATION	100%	3,168.00	3,168.00	100%	3,168.00	7.27	4.51	9.69	29.08
12	2	CALTRAN ID#12-071614	3091 N BRISTOL ST	IRRIGATION	100%	3,118.00	3,118.00	100%	3,118.00	7.15	4.44	9.54	28.62
13	1	COLTON CORPORATION CENTER PARTNERS	3209 S CRODDY WAY	IRRIGATION	100%	3,057.00	3,057.00	100%	3,057.00	7.01	4.35	9.35	28.06
14	1	ARMSTRONG RANCH	3327 S SHEFFIELD RD	IRRIGATION	100%	3,039.00	3,039.00	100%	3,039.00	6.97	4.33	9.30	27.90
15	3	PACIFIC CENTER OWNER, LLC	1610 E ST ANDREW PL	IRRIGATION	100%	2,972.00	2,972.00	100%	2,972.00	6.82	4.23	9.09	27.28
16	2	RIVERGLEN HOMES IRRIGATION	2845 N AUGUSTA WAY	IRRIGATION	100%	2,862.00	2,862.00	100%	2,862.00	6.57	4.07	8.76	26.27
17	1	OCEANSIDE INTERNATIONAL PROPERTIES	2901 W MACARTHUR BLVD	IRRIGATION	100%	2,748.00	2,748.00	100%	2,748.00	6.31	3.91	8.41	25.22

City of Santa Ana Recycled Water Master Plan
Potential Recycled Water Retrofit Sites by Customer Type

Site No.	Phase	Customer Name	Customer Address	Tax District	Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Domestic Water Annual Demand (BU/YR)	Potential Recycled Water Use (BU/YR)	Final Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Final Potential Recycled Water Demand (BU/YR)	Final Potential Recycled Water Demand (AFT/YR)	Average Daily Demand (ADD) GPM	Max Day Demand (MDD) GPM	Peak Hour Demand (PHD) GPM
18	1	OCEANSIDE INTERNATIONAL PROPERTIES	2901 W MACARTHUR BLVD	IRRIGATION	100%	2,748.00	2,748.00	100%	2,748.00	6.31	3.91	8.41	25.22
19	3	PALMDALE AVENUE S LLC	1740 E 17TH ST	IRRIGATION	100%	2,623.00	2,623.00	100%	2,623.00	6.02	3.73	8.03	24.08
20	3	PACIFICENTER OWNERS' ASSOCIATION	1601 E ST ANDREW PL 1/2	IRRIGATION	100%	2,612.00	2,612.00	100%	2,612.00	5.99	3.72	7.99	23.98
21	2	GGF BRISTOL LLC	1702 N BRISTOL ST	IRRIGATION	100%	2,605.00	2,605.00	100%	2,605.00	5.98	3.71	7.97	23.91
22	3	PMS/BRADT PL/HM ASC	3000 S SYCAMORE ST	IRRIGATION	100%	2,542.00	2,542.00	100%	2,542.00	5.83	3.62	7.78	23.33
23	1	BANC OF CALIFORNIA	3 IMPERIAL PROMENADE	IRRIGATION	100%	2,525.00	2,525.00	100%	2,525.00	5.79	3.59	7.73	23.18
24	3	PMS/BRADF PL/HM ASC	2931 S SYCAMORE ST	IRRIGATION	100%	2,327.00	2,327.00	100%	2,327.00	5.34	3.31	7.12	21.36
25	1	FIRST AMERICAN FINANCIAL CORP	7 E FIRST AMERICAN WAY	IRRIGATION	100%	2,273.00	2,273.00	100%	2,273.00	5.22	3.24	6.96	20.86
26	1	ROBINSON PHARMA INC	3330 S HARBOR BLVD	IRRIGATION	100%	2,140.00	2,140.00	100%	2,140.00	4.91	3.05	6.55	19.64
27	4	CONDOS NEWHOPE	200 N NEWHOPE ST	IRRIGATION	100%	2,134.00	2,134.00	100%	2,134.00	4.90	3.04	6.53	19.59
28	1	LAKE CENTER PARTNERS	3700 S SUSAN ST	IRRIGATION	100%	2,118.00	2,118.00	100%	2,118.00	4.86	3.01	6.48	19.44
29	1	LAKE CENTER PARTNERS	3700 S SUSAN ST	IRRIGATION	100%	2,118.00	2,118.00	100%	2,118.00	4.86	3.01	6.48	19.44
30	3	HERITAGE PAPER	2400 S GRAND AVE	IRRIGATION	100%	2,051.00	2,051.00	100%	2,051.00	4.71	2.92	6.28	18.83
31	4	HARBOR HAZARD HOA	3820 W HAZARD AVE	IRRIGATION	100%	2,037.00	2,037.00	100%	2,037.00	4.67	2.90	6.23	18.70
32	2	GGF BRISTOL LLC	1439 W 17TH ST	IRRIGATION	100%	2,000.00	2,000.00	100%	2,000.00	4.59	2.85	6.12	18.36
33	1	ARMSTRONG RANCH	3326 S SHEFFIELD RD	IRRIGATION	100%	1,962.00	1,962.00	100%	1,962.00	4.50	2.79	6.00	18.01
34	4	VIENAMESE CATHOLIC CENTER	1538 N CENTURY BLVD	IRRIGATION	100%	1,915.00	1,915.00	100%	1,915.00	4.39	2.73	5.86	17.58
35	1	FIRST AMERICAN FINANCIAL CORP	6 E FIRST AMERICAN WAY	IRRIGATION	100%	1,885.00	1,885.00	100%	1,885.00	4.33	2.68	5.77	17.30
36	4	MGP XI SANTA ANA CENTRE, LLC	100 N HARBOR BLVD	IRRIGATION	100%	1,844.00	1,844.00	100%	1,844.00	4.23	2.62	5.64	16.93
37	1	BRADFORD PLACE W 506	581 W ALTON AVE	IRRIGATION	100%	1,761.00	1,761.00	100%	1,761.00	4.04	2.51	5.39	16.17
38	2	RONALD REAGAN FED COURTHOUSE	411 W 4TH ST	IRRIGATION	100%	1,757.00	1,757.00	100%	1,757.00	4.03	2.50	5.38	16.13
39	1	VK MACARTHUR LLC	2701 W MACARTHUR BLVD	IRRIGATION	100%	1,749.00	1,749.00	100%	1,749.00	4.01	2.49	5.35	16.05
40	1	VK MACARTHUR LLC	2701 W MACARTHUR BLVD	IRRIGATION	100%	1,749.00	1,749.00	100%	1,749.00	4.01	2.49	5.35	16.05
41	3	PACIFICENTER OWNERS ASSOCIATION	1702 E EDINGER AVE	IRRIGATION	100%	1,712.00	1,712.00	100%	1,712.00	3.93	2.44	5.24	15.72
42	1	COLTON CORPORATION CENTER PARTNERS	3800 W GARRY AVE 1/2	IRRIGATION	100%	1,688.00	1,688.00	100%	1,688.00	3.87	2.40	5.17	15.50
43	2	JOHN LAING HOMES	2853 W EDINGER AVE 1/2	IRRIGATION	100%	1,657.00	1,657.00	100%	1,657.00	3.80	2.36	5.07	15.21
44	2	JOHN LAING HOMES	2853 W EDINGER AVE 1/2	IRRIGATION	100%	1,657.00	1,657.00	100%	1,657.00	3.80	2.36	5.07	15.21
45	3	PACIFICENTER OWNERS' ASSOCIATION	1504 E ST ANDREW PL	IRRIGATION	100%	1,654.00	1,654.00	100%	1,654.00	3.80	2.35	5.06	15.18
46	3	WEST FLAGER, LLC DBA CITY PLACE	2791 N MAIN ST 3/4	IRRIGATION	100%	1,623.00	1,623.00	100%	1,623.00	3.72	2.31	4.97	14.90
47	3	PRES CORPORATE CENTER LLC	1671 E ST ANDREW PL 1/2	IRRIGATION	100%	1,620.00	1,620.00	100%	1,620.00	3.72	2.31	4.96	14.87
48	1	CITY OF SANTA ANA MEDIAN	2010 W SEGERSTROM AVE	IRRIGATION	100%	1,541.00	1,541.00	100%	1,541.00	3.54	0.00	0.00	0.01
49	4	RIVERVIEW WEST MRKTPLACE IRR	741 S HARBOR BLVD	IRRIGATION	100%	1,461.00	1,461.00	100%	1,461.00	3.35	2.08	4.47	13.41
50	3	PARKCENTER MGM	2039 E FRUIT ST	IRRIGATION	100%	1,440.00	1,440.00	100%	1,440.00	3.30	2.05	4.41	13.22
51	1	SAN SPR HM/ACT PRP M	1535 S RAITT ST	IRRIGATION	100%	1,417.00	1,417.00	100%	1,417.00	3.25	2.02	4.34	13.01
52	3	1750 ACQUISITIONS PARTNERS, LLC	1750 E 4TH ST	IRRIGATION	100%	1,403.00	1,403.00	100%	1,403.00	3.22	0.00	0.00	0.01
53	3	MAINPLACE SHOPPINGTOWN, LLC	2800 N MAIN ST	IRRIGATION	100%	1,378.00	1,378.00	100%	1,378.00	3.16	1.96	4.22	12.65
54	3	BRADFORD WEST HOA 50	2910 S BRADFORD PL	IRRIGATION	100%	1,364.00	1,364.00	100%	1,364.00	3.13	1.94	4.17	12.52
55	1	SAN SPR HM/ACT PRP M	1533 S RAITT ST	IRRIGATION	100%	1,354.00	1,354.00	100%	1,354.00	3.11	1.93	4.14	12.43
56	4	WAL-MART	3600 W MCFADDEN AVE	IRRIGATION	100%	1,316.00	1,316.00	100%	1,316.00	3.02	1.87	4.03	12.08
57	1	A POINT OF VIEW RESEARCH, INC.	3080 S HARBOR BLVD	IRRIGATION	100%	1,259.00	1,259.00	100%	1,259.00	2.89	0.00	0.00	0.01
58	3	PACIFIC CENTER OWNER, LLC	1550 E ST ANDREW PL	IRRIGATION	100%	1,247.00	1,247.00	100%	1,247.00	2.86	1.78	3.82	11.45
59	3	BRADFORD PL SA 2	460 W CARRIAGE DR	IRRIGATION	100%	1,245.00	1,245.00	100%	1,245.00	2.86	1.77	3.81	11.43
60	4	SEABREEZE	1206 N HARBOR BLVD 3/4	IRRIGATION	100%	1,226.00	1,226.00	100%	1,226.00	2.81	1.75	3.75	11.25
61	4	POOR CLARE MISSIONAR	1019 N NEWHOPE ST	IRRIGATION	100%	1,200.00	1,200.00	100%	1,200.00	2.75	1.71	3.67	11.02
62	2	AMCAL GENERAL CONTRACTORS INC	1600 W MEMORY LN 3/4	IRRIGATION	100%	1,186.00	1,186.00	100%	1,186.00	2.72	1.69	3.63	10.89
63	2	FAIRVIEW TOWNHOMES	168 S FAIRVIEW ST	IRRIGATION	100%	1,145.00	1,145.00	100%	1,145.00	2.63	1.63	3.50	10.51

City of Santa Ana Recycled Water Master Plan
Potential Recycled Water Retrofit Sites by Customer Type

Site No.	Phase	Customer Name	Customer Address	Tax District	Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Domestic Water Annual Demand (BU/YR)	Potential Recycled Water Use (BU/YR)	Final Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Final Potential Recycled Water Demand (BU/YR)	Final Potential Recycled Water Demand (AFT/YR)	Average Daily Demand (ADD) GPM	Max Day Demand (MDD) GPM	Peak Hour Demand (PHD) GPM
64	3	WARNER GRAND PLAZA	2214 S GRAND AVE	IRRIGATION	100%	1,110.00	1,110.00	100%	1,110.00	2.55	1.58	3.40	10.19
65	1	BRE/OC MACARTHUR, LLC	302 E COLUMBINE AVE	IRRIGATION	100%	1,108.00	1,108.00	100%	1,108.00	2.54	1.58	3.39	10.17
66	3	BRADFORD PLACE WEST	3010 S BRADFORD PL	IRRIGATION	100%	1,052.00	1,052.00	100%	1,052.00	2.41	1.50	3.22	9.66
67	4	GROVE TOWN HOMES OAK	909 N WILLARDSON WAY	IRRIGATION	100%	1,042.00	1,042.00	100%	1,042.00	2.39	1.48	3.19	9.57
68	3	BRADFORD PLACE SA 2	3001 S BRADFORD PL	IRRIGATION	100%	1,028.00	1,028.00	100%	1,028.00	2.36	1.46	3.15	9.44
69	1	CITY OF SANTA ANA MEDIAN	3431 S BEAR ST	IRRIGATION	100%	1,027.00	1,027.00	100%	1,027.00	2.36	0.38	0.81	2.43
70	3	DISCOVERY SCIENCE CENTER	2500 N MAIN ST	IRRIGATION	100%	1,010.00	1,010.00	100%	1,010.00	2.32	1.44	3.09	9.27
71	1	BRADFORD PLACE WEST	531 W ALTON AVE	IRRIGATION	100%	993.00	993.00	100%	993.00	2.28	1.41	3.04	9.12
72	1	SAN SPR HM/ACT PRP M	1517 S RAITT ST	IRRIGATION	100%	986.00	986.00	100%	986.00	2.26	1.40	3.02	9.05
73	3	BRADFORD PL SA #2	2941 S BRADFORD PL	IRRIGATION	100%	953.00	953.00	100%	953.00	2.19	1.36	2.92	8.75
74	3	MABURY SQ OWNERS ASSOC	1642 E FRUIT ST	IRRIGATION	100%	943.00	943.00	100%	943.00	2.16	1.34	2.89	8.66
75	3	17TH ST PARK COMMUNITY ASS	1601 E 17TH ST	IRRIGATION	100%	934.00	934.00	100%	934.00	2.14	1.33	2.86	8.57
76	1	D & S INVESTMENTS LLC	3751 S HARBOR BLVD	IRRIGATION	100%	925.00	925.00	100%	925.00	2.12	1.32	2.83	8.49
77	3	BRADFORD PL II 505	2971 S BRADFORD PL	IRRIGATION	100%	910.00	910.00	100%	910.00	2.09	1.30	2.78	8.35
78	3	LOS OLIVOS BUS PARK	301 W DYER RD	IRRIGATION	100%	873.00	873.00	100%	873.00	2.00	1.24	2.67	8.01
79	1	SOUTH COAST PLAZA	3951 S PLAZA DR	IRRIGATION	100%	817.00	817.00	100%	817.00	1.87	1.16	2.50	7.50
80	3	PACIFICENTER OWNERS' ASSOCIATION	1658 E ST ANDREW PL	IRRIGATION	100%	814.00	814.00	100%	814.00	1.87	1.16	2.49	7.47
81	4	HARBOR PLACE SHOPPING CENTER LLC	622 S HARBOR BLVD	IRRIGATION	100%	758.00	758.00	100%	758.00	1.74	1.08	2.32	6.96
82	3	LOS OLIVOS BUS PARK	201 W DYER RD	IRRIGATION	100%	728.00	728.00	100%	728.00	1.67	1.04	2.23	6.68
83	3	ADAPT AUTOMATION INC	1661 E PALM ST	IRRIGATION	100%	722.00	722.00	100%	722.00	1.66	1.03	2.21	6.63
84	3	TRUST A DUNTLEY	132 E DYER RD	IRRIGATION	100%	687.00	687.00	100%	687.00	1.58	0.98	2.10	6.31
85	1	APPLE NINE HOSPITALITY MGMT	212 E MACARTHUR BLVD	IRRIGATION	100%	676.00	676.00	100%	676.00	1.55	0.96	2.07	6.21
86	3	LOS OLIVOS BUS PARK	2720 S MAIN ST	IRRIGATION	100%	644.00	644.00	100%	644.00	1.48	0.92	1.97	5.91
87	3	PARKCENTER MGM	1937 E FRUIT ST	IRRIGATION	100%	620.00	620.00	100%	620.00	1.42	0.88	1.90	5.69
88	3	17TH ST PARK COMMUNITY ASS	1601 E 18TH ST	IRRIGATION	100%	619.00	619.00	100%	619.00	1.42	0.88	1.89	5.68
89	2	17 TH STREET LLC	802 W 17TH ST	IRRIGATION	100%	584.00	584.00	100%	584.00	1.34	0.83	1.79	5.36
90	3	MC DONALD CORPORATION	2300 S MAIN ST	IRRIGATION	100%	581.00	581.00	100%	581.00	1.33	0.83	1.78	5.33
91	2	GGF BRISTOL LLC	1545 W 17TH ST 1/2	IRRIGATION	100%	561.00	561.00	100%	561.00	1.29	0.80	1.72	5.15
92	1	BRISTOL CENTER HOLDINGS LP	1204 W MACARTHUR BLVD	IRRIGATION	100%	494.00	494.00	100%	494.00	1.13	0.70	1.51	4.54
93	1	DAVID E HAHNFELD	3080 S HARBOR BLVD	IRRIGATION	100%	480.00	480.00	100%	480.00	1.10	0.68	1.47	4.41
94	2	ARTISTS WALK CORPORATION	240 N BUSH ST	IRRIGATION	100%	468.00	468.00	100%	468.00	1.07	0.67	1.43	4.30
95	3	O.C. APARTMENTS, LLC	1600 N MABURY ST	IRRIGATION	100%	445.00	445.00	100%	445.00	1.02	0.63	1.36	4.09
96	3	5 FRWY @ 1ST ST FREEWAY IRR	1729 E 1ST ST	IRRIGATION	100%	436.00	436.00	100%	436.00	1.00	0.62	1.33	4.00
97	1	BEHR PROCESS CORP	3400 W SEGERSTROM AVE	IRRIGATION	100%	429.00	429.00	100%	429.00	0.98	0.61	1.31	3.94
98	3	PARKCENTER MGM	2007 E FRUIT ST	IRRIGATION	100%	415.00	415.00	100%	415.00	0.95	0.59	1.27	3.81
99	3	BOYD SANTA ANA, LLC	1750 E 4TH ST	IRRIGATION	100%	407.00	407.00	100%	407.00	0.93	0.58	1.25	3.74
100	3	OHANA INVESTOR 3 LLC	1600 N MABURY ST	IRRIGATION	100%	396.00	396.00	100%	396.00	0.91	0.56	1.21	3.64
101	1	WESTVALE TOWN HOMES	2125 W EDINGER AVE	IRRIGATION	100%	392.00	392.00	100%	392.00	0.90	0.56	1.20	3.60
102	1	LAS BRISAS H O A	2315 W EDINGER AVE	IRRIGATION	100%	384.00	384.00	100%	384.00	0.88	0.55	1.18	3.53
103	2	ARTISTS WALK CORPORATION	221 N BUSH ST 3/4	IRRIGATION	100%	359.00	359.00	100%	359.00	0.82	0.51	1.10	3.30
104	3	LOS OLIVOS BUSINESS PARK	2700 S MAIN ST	IRRIGATION	100%	359.00	359.00	100%	359.00	0.82	0.51	1.10	3.30
105	2	CIVIC CENTER BUSINESS P	503 N FAIRVIEW ST	IRRIGATION	100%	350.00	350.00	100%	350.00	0.80	0.50	1.07	3.21
106	1	BANKERS MORTGAGE CO	3080 S HARBOR BLVD	IRRIGATION	100%	349.00	349.00	100%	349.00	0.80	0.50	1.07	3.20
107	1	SO CO TERR/RPM	1001 W STEVENS AVE	IRRIGATION	100%	330.00	330.00	100%	330.00	0.76	0.47	1.01	3.03
108	2	GOODWILL INDUSTRIES	200 N FAIRVIEW ST	IRRIGATION	100%	302.00	302.00	100%	302.00	0.69	0.43	0.92	2.77
109	1	FIRST AMERICAN FINANCIAL CORP	8 E FIRST AMERICAN WAY	IRRIGATION	100%	300.00	300.00	100%	300.00	0.69	0.43	0.92	2.75

City of Santa Ana Recycled Water Master Plan
Potential Recycled Water Retrofit Sites by Customer Type

Site No.	Phase	Customer Name	Customer Address	Tax District	Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Domestic Water Annual Demand (BU/YR)	Potential Recycled Water Use (BU/YR)	Final Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Final Potential Recycled Water Demand (BU/YR)	Final Potential Recycled Water Demand (AFT/YR)	Average Daily Demand (ADD) GPM	Max Day Demand (MDD) GPM	Peak Hour Demand (PHD) GPM
110	3	EXEC GUILD	1800 E 16TH ST	IRRIGATION	100%	297.00	297.00	100%	297.00	0.68	0.42	0.91	2.73
111	2	SANTA ANA WBBB	219 S BIRCH ST 3/4	IRRIGATION	100%	293.00	293.00	100%	293.00	0.67	0.42	0.90	2.69
112	3	LOS OLIVOS BUS PARK	2800 S MAIN ST	IRRIGATION	100%	288.00	288.00	100%	288.00	0.66	0.41	0.88	2.64
113	3	CATHOLIC CHARITIES OF ORANGE COUNTY	1800 E 17TH ST	IRRIGATION	100%	283.00	283.00	100%	283.00	0.65	0.40	0.87	2.60
114	4	BBSC DEVELOPMENT LLC	3710 W WESTMINSTER AVE	IRRIGATION	100%	282.00	282.00	100%	282.00	0.65	0.40	0.86	2.59
115	1	CITY OF SANTA ANA MEDIAN	3700 S BEAR ST 1/2	IRRIGATION	100%	271.00	271.00	100%	271.00	0.62	0.00	0.00	0.01
116	2	BMPBTC LLC	1800 N BRISTOL ST	IRRIGATION	100%	271.00	271.00	100%	271.00	0.62	0.39	0.83	2.49
117	1	PROPERTY OWNER	701 E ALTON AVE	IRRIGATION	100%	266.00	266.00	100%	266.00	0.61	0.00	0.00	0.01
118	3	IRON MOUNTAIN-SOCAL TERRITORY	1915 S GRAND AVE	IRRIGATION	100%	260.00	260.00	100%	260.00	0.60	0.37	0.80	2.39
119	4	MARY CHANG	808 N HARBOR BLVD	IRRIGATION	100%	255.00	255.00	100%	255.00	0.59	0.00	0.00	0.01
120	3	PARKHOUSE TIRE	711 S GRAND AVE	IRRIGATION	100%	233.00	233.00	100%	233.00	0.53	0.33	0.71	2.14
121	3	NATHAN LEANSE	1590 E ST GERTRUDE PL	IRRIGATION	100%	233.00	233.00	100%	233.00	0.53	0.33	0.71	2.14
122	1	CITY OF SANTA ANA MEDIAN	4800 W EDINGER AVE 1/2	IRRIGATION	100%	228.00	228.00	100%	228.00	0.52	0.00	0.00	0.01
123	4	LAS BOLSAS	4323 W 1ST ST 1/2	IRRIGATION	100%	227.00	227.00	100%	227.00	0.52	0.32	0.70	2.08
124	2	ORANGE COUNTY CREDIT UNION	841 N VAN NESS AVE	IRRIGATION	100%	222.00	222.00	100%	222.00	0.51	0.32	0.68	2.04
125	2	GOODWILL INDUSTRIES	410 N FAIRVIEW ST 3/4	IRRIGATION	100%	202.00	202.00	100%	202.00	0.46	0.29	0.62	1.85
126	2	RED MOUNTAIN RETAIL GROUP INC	2725 N BRISTOL ST	IRRIGATION	100%	198.00	198.00	100%	198.00	0.45	0.28	0.61	1.82
127	2	EL RINCON CHILANGO	1133 W 17TH ST	IRRIGATION	100%	189.00	189.00	100%	189.00	0.43	0.27	0.58	1.74
128	3	RITCHEY ASSOCIATED LLC	1922 E ST ANDREW PL	IRRIGATION	100%	185.00	185.00	100%	185.00	0.42	0.26	0.57	1.70
129	2	JAMES C COGHLAN	1701 N ALONA ST	IRRIGATION	100%	177.00	177.00	100%	177.00	0.41	0.25	0.54	1.63
130	2	CV-SANTA ANA LOFTS MAINTENANCE CORP	241 N SYCAMORE ST 1/2	IRRIGATION	100%	160.00	160.00	100%	160.00	0.37	0.23	0.49	1.47
131	1	TA CHEN ENTERPRISES	3019 W EDINGER AVE	IRRIGATION	100%	153.00	153.00	100%	153.00	0.35	0.22	0.47	1.40
132	2	BRISTOL PARK MEDICAL	1212 W 17TH ST	IRRIGATION	100%	150.00	150.00	100%	150.00	0.34	0.21	0.46	1.38
133	1	3001 PACIFIC LLC	2330 W EDINGER AVE	IRRIGATION	100%	146.00	146.00	100%	146.00	0.33	0.21	0.45	1.34
134	4	LAS BOLSAS HOA	4329 W 1ST ST	IRRIGATION	100%	145.00	145.00	100%	145.00	0.33	0.21	0.44	1.33
135	2	PARKVIEW TOWNHOMES	2779 W EDINGER AVE	IRRIGATION	100%	141.00	141.00	100%	141.00	0.32	0.20	0.43	1.29
136	2	PARKVIEW TOWNHOMES	2779 W EDINGER AVE	IRRIGATION	100%	141.00	141.00	100%	141.00	0.32	0.20	0.43	1.29
137	3	BRADFORD PL SA #2	2981 S BRADFORD PL	IRRIGATION	100%	140.00	140.00	100%	140.00	0.32	0.20	0.43	1.29
138	4	ELM PARK TONWHOMES OWNERS ASSOC	3855 W HAZARD AVE	IRRIGATION	100%	133.00	133.00	100%	133.00	0.31	0.00	0.00	0.01
139	1	CONVENIENCE RETAILERS, LLC	1913 W EDINGER AVE	IRRIGATION	100%	111.00	111.00	100%	111.00	0.25	0.16	0.34	1.02
140	3	SADDLEBACK INN L L C	1659 E 1ST ST	IRRIGATION	100%	111.00	111.00	100%	111.00	0.25	0.16	0.34	1.02
141	1	SANTA ANA MEDIAN	3437 S BEAR ST	IRRIGATION	100%	105.00	105.00	100%	105.00	0.24	0.00	0.00	0.01
142	2	VILLA SANTA ANA H O	1030 W SANTA ANA BLVD	IRRIGATION	100%	99.00	99.00	100%	99.00	0.23	0.14	0.30	0.91
143	3	EXCALIBER FUELS & MART	1501 E EDINGER AVE	IRRIGATION	100%	94.00	94.00	100%	94.00	0.22	0.13	0.29	0.86
144	3	CANS FOR COINS	2629 S CYPRESS AVE	IRRIGATION	100%	83.00	83.00	100%	83.00	0.19	0.12	0.25	0.76
145	2	LAYNE BALLARD	1040 W SANTA ANA BLVD	IRRIGATION	100%	74.00	74.00	100%	74.00	0.17	0.11	0.23	0.68
146	3	CAL-TRANS MEDIAN IRRIGATION	2519 N MAIN ST	IRRIGATION	100%	70.00	70.00	100%	70.00	0.16	0.00	0.00	0.01
147	1	CITY OF SANTA ANA MEDIAN	1960 W ST GERTRUDE PL	IRRIGATION	100%	49.00	49.00	100%	49.00	0.11	0.00	0.00	0.01
148	3	ASHTON PROPERTIES LTD	124 E CENTRAL AVE	IRRIGATION	100%	45.00	45.00	100%	45.00	0.10	0.06	0.14	0.41
149	1	T-MOBILE WEST CORPORATION	2235 W STANFORD ST	IRRIGATION	100%	43.00	43.00	100%	43.00	0.10	0.00	0.01	0.02
150	2	POLITISKI ROBERT	835 N PARTON ST	IRRIGATION	100%	43.00	43.00	100%	43.00	0.10	0.00	0.00	0.01
151	2	JOHN LAING HOMES	2855 W EDINGER AVE 1/2	IRRIGATION	100%	43.00	43.00	100%	43.00	0.10	0.00	0.00	0.01
152	2	JOHN LAING HOMES	2855 W EDINGER AVE 1/2	IRRIGATION	100%	43.00	43.00	100%	43.00	0.10	0.00	0.00	0.01
153	3	RICHARD A AYLING	1840 E 16TH ST	IRRIGATION	100%	43.00	43.00	100%	43.00	0.10	0.00	0.00	0.01
154	1	CITY OF SANTA ANA MEDIAN	900 W MACARTHUR BLVD 1/2	IRRIGATION	100%	40.00	40.00	100%	40.00	0.09	0.06	0.12	0.37
155	4	TRANG LIN	3509 W 5TH ST 3/4	IRRIGATION	100%	35.00	35.00	100%	35.00	0.08	0.05	0.11	0.32

City of Santa Ana Recycled Water Master Plan
Potential Recycled Water Retrofit Sites by Customer Type

Site No.	Phase	Customer Name	Customer Address	Tax District	Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Domestic Water Annual Demand (BU/YR)	Potential Recycled Water Use (BU/YR)	Final Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Final Potential Recycled Water Demand (BU/YR)	Final Potential Recycled Water Demand (AFT/YR)	Average Daily Demand (ADD) GPM	Max Day Demand (MDD) GPM	Peak Hour Demand (PHD) GPM
156	4	DAVID MAI	626 S NEWHOPE ST	IRRIGATION	100%	29.00	29.00	100%	29.00	0.07	0.04	0.09	0.27
157	1	IRWD	1704 W SEGERSTROM AVE	IRRIGATION	100%	26.00	26.00	100%	26.00	0.06	0.04	0.08	0.24
158	3	BT INVESTMENT	2416 S MAIN ST	IRRIGATION	100%	11.00	11.00	100%	11.00	0.03	0.02	0.03	0.10
159	3	FDTN HEALTH KAISER	1900 E 4TH ST	IRRIGATION	100%	9.00	9.00	100%	9.00	0.02	0.01	0.03	0.08
160	4	SOUTH COAST CAR COMPANY, INC.	808 N HARBOR BLVD	IRRIGATION	100%	1.00	1.00	100%	1.00	0.00	0.00	0.00	0.01
										797.28			
1	3	WESTERN MEDICAL CENTER	1001 N TUSTIN AVE	MEDICAL	50%	34,119.00	17,059.50	5%	1,705.95	3.91	2.43	5.22	15.66
1	4	PARK TERRACE MOBILE HOME PARK	4080 W 1ST ST	MOBILE HOME	40%	25,298.00	10,119.20	10%	2,529.80	5.80	3.60	7.74	23.22
2	4	LAKE PARK SANTA ANA	4211 W 1ST ST	MOBILE HOME	40%	19,356.00	7,742.40	10%	1,935.60	4.44	2.76	5.92	17.77
										10.25			
1	3	BROOKHOLLOW OFFICE PARK	1528 E WARNER AVE	MST RETAIL	50%	15,450.00	7,725.00	20%	3,090.00	7.09	4.40	9.46	28.36
2	3	MAINPLACE SHOPPINGTOWN, LLC	2800 N MAIN ST	MST RETAIL	50%	11,219.00	5,609.50	20%	2,243.80	5.15	3.19	6.87	20.60
										12.24			
1	2	RANCHO SANTIAGO COMMUNITY COLLEGE D	1606 N BRISTOL ST	SCHOOL	75%	17,835.00	13,376.30	25%	4,458.75	10.23	6.35	13.64	40.93
2	2	SAUSD	2701 W 5TH ST	SCHOOL	75%	16,332.00	12,249.00	25%	4,083.00	9.37	5.81	12.49	37.48
3	1	SAUSD	2802 S FLOWER ST	SCHOOL	75%	15,820.00	11,865.00	25%	3,955.00	9.07	5.63	12.10	36.30
4	4	GGUSD	4600 W MCFADDEN AVE	SCHOOL	75%	15,797.00	11,847.80	25%	3,949.25	9.06	5.62	12.08	36.25
5	3	SAUSD	1401 S GRAND AVE	SCHOOL	75%	15,172.00	11,379.00	25%	3,793.00	8.70	5.40	11.61	34.82
6	2	SANTA ANA COLLEGE	1530 W 17TH ST	SCHOOL	75%	12,912.00	9,684.00	25%	3,228.00	7.41	4.59	9.88	29.63
7	2	SAUSD-SANTA ANA HIGH SCHOOL	401 S PARTON ST	SCHOOL	75%	10,307.00	7,730.30	25%	2,576.75	5.91	3.67	7.88	23.65
8	1	SAUSD	2301 W MACARTHUR AVE	SCHOOL	75%	2,848.67	2,136.50	1	2,136.50	4.90	3.04	6.54	19.61
9	1	CALVARY CHAPEL/SCHOOL	3800 S FAIRVIEW ST	SCHOOL	75%	8,392.00	6,294.00	25%	2,098.00	4.81	2.99	6.42	19.26
10	4	GGUSD/ROSITA ELEMENTARY SCHL	4726 W HAZARD AVE	SCHOOL	75%	7,575.00	5,681.30	25%	1,893.75	4.35	2.70	5.79	17.38
11	1	SAUSD	600 W ALTON AVE	SCHOOL	75%	7,195.00	5,396.30	25%	1,798.75	4.13	2.56	5.50	16.51
12	4	GGUSD/HAZARD ELEMENTARY SCHL	4218 W HAZARD AVE	SCHOOL	75%	7,003.00	5,252.30	25%	1,750.75	4.02	2.49	5.36	16.07
13	2	SAUSD	1900 N BRISTOL ST	SCHOOL	75%	6,798.00	5,098.50	25%	1,699.50	3.90	2.42	5.20	15.60
14	4	GGUSD	600 S JACKSON ST	SCHOOL	75%	6,712.00	5,034.00	25%	1,678.00	3.85	2.39	5.13	15.40
15	3	SAUSD	2240 S MAIN ST	SCHOOL	75%	6,083.00	4,562.30	25%	1,520.75	3.49	2.16	4.65	13.96
16	3	SAUSD-VILLA INTERMEDIATE SCHOOL	1441 E CHESTNUT AVE	SCHOOL	75%	7,222.00	5,416.50	20%	1,444.40	3.31	2.06	4.42	13.26
17	1	SAUSD	2120 W EDINGER AVE	SCHOOL	75%	1,693.33	1,270.00	1	1,270.00	2.91	1.81	3.89	11.66
18	3	SAUSD	417 E CENTRAL AVE	SCHOOL	75%	4,727.00	3,545.30	25%	1,181.75	2.71	1.68	3.62	10.85
19	1	CALVARY CHAPEL OF COSTA MESA	3000 W MACARTHUR BLVD	SCHOOL	75%	3,695.00	2,771.30	25%	923.75	2.12	1.32	2.83	8.48
20	1	CALVARY CHAPEL OF COSTA MESA	3000 W MACARTHUR BLVD	SCHOOL	75%	1,231.67	923.75	75%	923.75	2.12	1.32	2.83	8.48
21	2	SAUSD	417 W WALNUT ST	SCHOOL	75%	3,146.00	2,359.50	25%	786.50	1.80	1.12	2.41	7.22
22	1	SAUSD	2250 S RAITT ST	SCHOOL	75%	1,036.00	777.00	1	777.00	1.78	1.11	2.38	7.13
23	4	GGUSD	4815 W CAMILLE ST	SCHOOL	75%	3,100.00	2,325.00	25%	775.00	1.78	1.10	2.37	7.11
24	1	SAUSD	2305 W EDINGER AVE	SCHOOL	75%	997.67	748.25	1	748.25	1.72	1.07	2.29	6.87

City of Santa Ana Recycled Water Master Plan
Potential Recycled Water Retrofit Sites by Customer Type

Site No.	Phase	Customer Name	Customer Address	Tax District	Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Domestic Water Annual Demand (BU/YR)	Potential Recycled Water Use (BU/YR)	Final Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Final Potential Recycled Water Demand (BU/YR)	Final Potential Recycled Water Demand (AFT/YR)	Average Daily Demand (ADD) GPM	Max Day Demand (MDD) GPM	Peak Hour Demand (PHD) GPM
25	3	SAUSD	1601 E CHESTNUT AVE	SCHOOL	75%	2,929.00	2,196.80	25%	732.25	1.68	1.04	2.24	6.72
26	1	SAUSD	3600 S RAITT ST	SCHOOL	75%	916.00	687.00	1	687.00	1.58	0.98	2.10	6.31
27	2	SAUSD	1401 W SANTA ANA BLVD	SCHOOL	75%	2,685.00	2,013.80	25%	671.25	1.54	0.96	2.05	6.16
28	2	NEWSONG COMMUNITY CHURCH	1014 W 17TH ST	SCHOOL	75%	2,152.00	1,614.00	25%	538.00	1.23	0.77	1.65	4.94
29	1	SAUSD-MCFADDEN INTER SCHOOL	2701 S RAITT ST	SCHOOL	75%	603.33	452.50	1	452.50	1.04	0.64	1.39	4.15
30	2	SAUSD	1111 W CIVIC CENTER DR W	SCHOOL	75%	1,707.00	1,280.30	25%	426.75	0.98	0.61	1.31	3.92
31	1	RANCHO SANTIAGO COMMUNITY COLLEGE D	2900 W EDINGER AVE	SCHOOL	75%	541.67	406.25	1	406.25	0.93	0.58	1.24	3.73
32	2	SAUSD	719 W WALNUT ST	SCHOOL	75%	1,180.00	885.00	25%	295.00	0.68	0.42	0.90	2.71
33	2	SAUSD	817 W WALNUT ST	SCHOOL	75%	566.00	424.50	25%	141.50	0.32	0.20	0.43	1.30
34	2	RANCHO SANTIAGO COMMUNITY COLLEGE D	1530 W 17TH ST	SCHOOL	75%	502.00	376.50	25%	125.50	0.29	0.18	0.38	1.15
35	2	SAUSD	1512 W SANTA ANA BLVD	SCHOOL	75%	469.00	351.80	25%	117.25	0.27	0.17	0.36	1.08
36	2	SAUSD	730 W WALNUT ST	SCHOOL	75%	399.00	299.30	25%	99.75	0.23	0.14	0.31	0.92
37	2	SAUSD	520 W WALNUT ST	SCHOOL	75%	130.00	97.50	25%	32.50	0.07	0.05	0.10	0.30
38	1	WESTPORT SCHOOL	2129 W EDINGER AVE	SCHOOL	75%	35.00	26.25	1	26.25	0.06	0.04	0.08	0.24
39	2	RANCHO SANTIAGO COMMUNITY COLLEGE D	1720 W 17TH ST	SCHOOL	75%	72.00	54.00	25%	18.00	0.04	0.03	0.06	0.17
40	1	VALLEY HI LITTLE LEAGUE	2045 W GLENWOOD PL	SCHOOL	75%	10.00	7.50	1	7.50	0.02	0.01	0.02	0.07
41	1	VALLEY HIGH LITTLE LEAGUE	2045 W GLENWOOD PL	SCHOOL	75%	10.00	7.50	1	7.50	0.02	0.01	0.02	0.07
42	1	SANTA ANA UNIFIED SCHOOL DISTRICT	3529 S GREENVILLE ST	SCHOOL	75%	11.00	8.30	25%	2.75	0.01	0.00	0.01	0.03
43	1	SANTA ANA UNIFIED SCHOOL DISTRICT	3529 S GREENVILLE ST	SCHOOL	75%	3.67	2.75	75%	2.75	0.01	0.00	0.01	0.03
										124.45			
1	4	ADOHR FARMS INC	4002 W WESTMINSTER AVE	WHOLESALE FOOD	50%	102,074.00	51,037.00	50%	51,037.00	117.10	72.63	156.16	468.48
2	3	NATHAN LEANSE	1505 E WARNER AVE	WHOLESALE FOOD	50%	25,326.00	12,663.00	50%	12,663.00	29.05	18.02	38.75	116.24
3	1	GOGLANIAN BAKERIES	3401 W SEGERSTROM AVE	WHOLESALE FOOD	50%	12,124.00	6,062.00	20%	2,424.80	5.56	3.45	7.42	22.26
										151.72			

CITY OF SANTA ANA RECYCLED WATER MASTER PLAN

Potential Recycled Water Retrofit Sites by Phase

Site No.	Phase	Customer Name	Customer Address	City	State	Zip Code	Tax District	Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Domestic Water Annual Demand (BU/YR)	Potential Recycled Water Use (BU/YR)	Final Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Final Potential Recycled Water Demand (BU/YR)	Final Potential Recycled Water Demand (AFT/YR)	Average Daily Demand (ADD) GPM	Max Day Demand (MDD) GPM	Peak Hour Demand (PHD) GPM
1	1	ON THE LK VERSAILLES	3700 S PLAZA DR	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	35,805.00	14,322.00	25%	8,951.25	20.54	12.74	27.39	82.17
2	1	FAR WEST MANAGEMENT CORP	1601 W MACARTHUR BLVD	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	47,536.00	19,014.40	20%	9,507.20	21.81	13.53	29.09	87.27
3	1	NEW WOODSIDE VILLAGE	2521 W SUNFLOWER AVE	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	20,057.00	8,022.80	25%	5,014.25	11.51	7.14	15.34	46.03
4	1	RP/ESSEX SKYLINE HOLDINGS, LLC	11 HUTTON CENTRE DR	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	22,971.00	9,188.40	20%	4,594.20	10.54	6.54	14.06	42.17
5	1	THE MARKE OF SOUTH COAST METRO LLC	100 E MACARTHUR BLVD	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	15,132.00	6,052.80	25%	3,783.00	8.68	5.38	11.58	34.73
6	1	THE PEARTREE APTS	3401 S PLAZA DR	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	9,515.00	3,806.00	25%	2,378.75	5.46	3.39	7.28	21.84
7	1	BRE PROPERTIES INC	3501 S MAIN ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	9,575.00	3,830.00	25%	2,393.75	5.49	3.41	7.32	21.97
8	1	CHELSEA COURT APTS	3500 S GREENVILLE ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	7,918.00	3,167.20	25%	1,979.50	4.54	2.82	6.06	18.17
9	1	WOODLAKE HOA	2528 W MACARTHUR BLVD	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	8,025.00	3,210.00	25%	2,006.25	4.60	2.86	6.14	18.42
10	1	CITY OF SANTA ANA MEDIAN	2801 S HARBOR BLVD	SANTA ANA	CA	92707	CITY IRRIGATION	100%	495.00	495.00	100%	495.00	1.14	0.70	1.52	4.54
11	1	CITY OF SANTA ANA	2951 FLOWER ST 3/4	SANTA ANA	CA	92707	CITY IRRIGATION	100%	490.00	490.00	100%	490.00	1.12	0.70	1.50	4.50
12	1	CITY OF SANTA ANA	521 W MACARTHUR BLVD	SANTA ANA	CA	92707	CITY IRRIGATION	100%	143.00	143.00	100%	143.00	0.33	0.20	0.44	1.31
13	1	CITY OF SANTA ANA MEDIAN	300 E MACARTHUR BLVD 1/2	SANTA ANA	CA	92707	CITY IRRIGATION	100%	138.00	138.00	100%	138.00	0.32	0.20	0.42	1.27
14	1	CITY OF SANTA ANA	522 W MACARTHUR BLVD	SANTA ANA	CA	92707	CITY IRRIGATION	100%	79.00	79.00	100%	79.00	0.18	0.11	0.24	0.73
15	1	CITY OF SANTA ANA MEDIAN	900 W MACARTHUR BLVD 1/2	SANTA ANA	CA	92707	CITY IRRIGATION	100%	40.00	40.00	100%	40.00	0.09	0.06	0.12	0.37
16	1	CITY OF SANTA ANA MEDIAN	3800 S PLAZA DR 1/2	SANTA ANA	CA	92707	CITY IRRIGATION	100%	312.00	312.00	100%	312.00	0.72	0.00	0.01	0.02
17	1	CITY OF SANTA ANA MEDIAN	4011 W SEGERSTROM AVE	SANTA ANA	CA	92707	CITY IRRIGATION	100%	348.00	348.00	100%	348.00	0.80	0.00	0.00	0.01
18	1	CITY OF SANTA ANA MEDIAN	410 W MACARTHUR BLVD	SANTA ANA	CA	92707	CITY IRRIGATION	100%	395.00	395.00	100%	395.00	0.91	0.00	0.00	0.01
19	1	CITY OF SANTA ANA MEDIAN	601 E DYER RD	SANTA ANA	CA	92707	CITY IRRIGATION	100%	71.00	71.00	100%	71.00	0.16	0.00	0.00	0.01
20	1	LILLIE KING PARK	500 W ALTON AVE	SANTA ANA	CA	92707	CITY PARK	90%	6,431.00	5,787.90	90%	5,787.90	13.28	8.24	17.71	53.13
21	1	SANDPOINTE PARK	3700 S BIRCH ST	SANTA ANA	CA	92707	CITY PARK	90%	4,691.00	4,221.90	90%	4,221.90	9.69	6.01	12.92	38.75
22	1	PASEO PARK	3630 S VAN NESS AVE	SANTA ANA	CA	92707	CITY PARK	90%	261.00	234.90	90%	234.90	0.54	0.33	0.72	2.16
24	1	POWER CIRCUITS INC	2640 S HARBOR BLVD	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	25,625.00	12,812.50	50%	12,812.50	29.40	18.23	39.20	117.61
25	1	BRE/OC GRIFFIN LLC	5 HUTTON CENTRE DR	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	17,016.00	8,508.00	50%	8,508.00	19.52	12.11	26.03	78.10
26	1	ROBINSON PHARMA INC	3330 S HARBOR BLVD	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	15,801.00	7,900.50	50%	7,900.50	18.13	11.24	24.17	72.52
27	1	LAKE CENTER BUS PK OWN ASSOC	3500 W LAKE CENTER DR	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	10,700.00	5,350.00	50%	5,350.00	12.28	7.61	16.37	49.11
28	1	PACIFICARE HEALTH SYSTEMS CORP	3120 W LAKE CENTER DR	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	10,169.00	5,084.50	50%	5,084.50	11.67	7.24	15.56	46.67
29	1	U S POSTAL SERVICE	3101 W SUNFLOWER AVE	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	9,456.00	4,728.00	50%	4,728.00	10.85	6.73	14.47	43.40
30	1	LAKESIDE PARTNERS HUTTON LLC	4 HUTTON CENTRE DR	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	7,262.00	3,631.00	50%	3,631.00	8.33	5.17	11.11	33.33
31	1	CODAN MEDLON INC	3501 W SUNFLOWER AVE	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	5,536.00	2,768.00	50%	2,768.00	6.35	3.94	8.47	25.41
32	1	BRE/OC MACARTHUR, LLC	1 E MACARTHUR PL	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	5,847.00	2,923.50	50%	2,923.50	6.71	4.16	8.95	26.84
33	1	OCEANSIDE INTERNATIONAL PROPERTIES	2901 W MACARTHUR BLVD	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	5,520.00	2,760.00	50%	2,760.00	6.33	3.93	8.45	25.34
34	1	BANC OF CALIFORNIA	3 IMPERIAL PROMENADE	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	5,229.00	2,614.50	50%	2,614.50	6.00	3.72	8.00	24.00
35	1	MDV PARTNERS	3001 S HARBOR BLVD	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	4,406.00	2,203.00	50%	2,203.00	5.05	3.14	6.74	20.22
36	1	CYPRESS 3HC, LLC	3 HUTTON CENTRE DR	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	4,230.00	2,115.00	50%	2,115.00	4.85	3.01	6.47	19.41
37	1	BEHR PROCESS CORP	3500 W SEGERSTROM AVE	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	3,999.00	1,999.50	50%	1,999.50	4.59	2.85	6.12	18.35
38	1	FIRST AMERICAN FINANCIAL CORP	5 E FIRST AMERICAN WAY	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	3,661.00	1,830.50	50%	1,830.50	4.20	2.61	5.60	16.80
39	1	WC SUNFLOWER OPS LLC	3730 S GREENVILLE ST	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	3,536.00	1,768.00	50%	1,768.00	4.06	2.52	5.41	16.23
40	1	OCFA #76	950 W MACARTHUR BLVD	SANTA ANA	CA	92707	GOVERNMENT	90%	253.00	227.70	40%	101.20	0.23	0.14	0.31	0.93
41	1	POWER CIRCUITS INC	2645 S CRODDY WAY	SANTA ANA	CA	92707	INDUS/DUMPT	50%	54,101.00	27,050.50	50%	27,050.50	62.07	38.50	82.77	248.30
42	1	PIONEER CIRCUITS INC	3010 S SHANNON ST	SANTA ANA	CA	92707	INDUS/DUMPT	50%	14,467.00	7,233.50	50%	7,233.50	16.60	10.29	22.13	66.40
43	1	SPS TECHNOLOGIES	2701 S HARBOR BLVD	SANTA ANA	CA	92707	INDUS/DUMPT	50%	9,255.00	4,627.50	50%	4,627.50	10.62	6.59	14.16	42.48
44	1	FIRST AMERICAN FINANCIAL CORP	3 E FIRST AMERICAN WAY	SANTA ANA	CA	92707	IRRIGATION	100%	6,369.00	6,369.00	100%	6,369.00	14.61	9.06	19.49	58.46
45	1	LAKE CENTER ASSOC	3401 W SUNFLOWER AVE	SANTA ANA	CA	92707	IRRIGATION	100%	3,890.00	3,890.00	100%	3,890.00	8.93	5.54	11.90	35.71
46	1	COLTON CORPORATION CENTER PARTNERS	3209 S CRODDY WAY	SANTA ANA	CA	92707	IRRIGATION	100%	3,057.00	3,057.00	100%	3,057.00	7.01	4.35	9.35	28.06
47	1	BANC OF CALIFORNIA	3 IMPERIAL PROMENADE	SANTA ANA	CA	92707	IRRIGATION	100%	2,525.00	2,525.00	100%	2,525.00	5.79	3.59	7.73	23.18
48	1	OCEANSIDE INTERNATIONAL PROPERTIES	2901 W MACARTHUR BLVD	SANTA ANA	CA	92707	IRRIGATION	100%	2,748.00	2,748.00	100%	2,748.00	6.31	3.91	8.41	25.22
49	1	FIRST AMERICAN FINANCIAL CORP	7 E FIRST AMERICAN WAY	SANTA ANA	CA	92707	IRRIGATION	100%	2,273.00	2,273.00	100%	2,273.00	5.22	3.24	6.96	20.86
50	1	ROBINSON PHARMA INC	3330 S HARBOR BLVD	SANTA ANA	CA	92707	IRRIGATION	100%	2,140.00	2,140.00	100%	2,140.00	4.91	3.05	6.55	19.64

CITY OF SANTA ANA RECYCLED WATER MASTER PLAN

Potential Recycled Water Retrofit Sites by Phase

Site No.	Phase	Customer Name	Customer Address	City	State	Zip Code	Tax District	Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Domestic Water Annual Demand (BU/YR)	Potential Recycled Water Use (BU/YR)	Final Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Final Potential Recycled Water Demand (BU/YR)	Final Potential Recycled Water Demand (AFT/YR)	Average Daily Demand (ADD) GPM	Max Day Demand (MDD) GPM	Peak Hour Demand (PHD) GPM
51	1	LAKE CENTER PARTNERS	3700 S SUSAN ST	SANTA ANA	CA	92707	IRRIGATION	100%	2,118.00	2,118.00	100%	2,118.00	4.86	3.01	6.48	19.44
52	1	FIRST AMERICAN FINANCIAL CORP	6 E FIRST AMERICAN WAY	SANTA ANA	CA	92707	IRRIGATION	100%	1,885.00	1,885.00	100%	1,885.00	4.33	2.68	5.77	17.30
53	1	BRADFORD PLACE W 506	581 W ALTON AVE	SANTA ANA	CA	92707	IRRIGATION	100%	1,761.00	1,761.00	100%	1,761.00	4.04	2.51	5.39	16.17
54	1	VK MACARTHUR LLC	2701 W MACARTHUR BLVD	SANTA ANA	CA	92707	IRRIGATION	100%	1,749.00	1,749.00	100%	1,749.00	4.01	2.49	5.35	16.05
55	1	COLTON CORPORATION CENTER PARTNERS	3800 W GARRY AVE 1/2	SANTA ANA	CA	92707	IRRIGATION	100%	1,688.00	1,688.00	100%	1,688.00	3.87	2.40	5.17	15.50
56	1	BRE/OC MACARTHUR, LLC	302 E COLUMBINE AVE	SANTA ANA	CA	92707	IRRIGATION	100%	1,108.00	1,108.00	100%	1,108.00	2.54	1.58	3.39	10.17
57	1	BRADFORD PLACE WEST	531 W ALTON AVE	SANTA ANA	CA	92707	IRRIGATION	100%	993.00	993.00	100%	993.00	2.28	1.41	3.04	9.12
58	1	SOUTH COAST PLAZA	3951 S PLAZA DR	SANTA ANA	CA	92707	IRRIGATION	100%	817.00	817.00	100%	817.00	1.87	1.16	2.50	7.50
59	1	APPLE NINE HOSPITALITY MGMT	212 E MACARTHUR BLVD	SANTA ANA	CA	92707	IRRIGATION	100%	676.00	676.00	100%	676.00	1.55	0.96	2.07	6.21
60	1	DAVID E HAHNFELD	3080 S HARBOR BLVD	SANTA ANA	CA	92707	IRRIGATION	100%	480.00	480.00	100%	480.00	1.10	0.68	1.47	4.41
61	1	BEHR PROCESS CORP	3400 W SEGERSTROM AVE	SANTA ANA	CA	92707	IRRIGATION	100%	429.00	429.00	100%	429.00	0.98	0.61	1.31	3.94
62	1	BANKERS MORTGAGE CO	3080 S HARBOR BLVD	SANTA ANA	CA	92707	IRRIGATION	100%	349.00	349.00	100%	349.00	0.80	0.50	1.07	3.20
63	1	FIRST AMERICAN FINANCIAL CORP	8 E FIRST AMERICAN WAY	SANTA ANA	CA	92707	IRRIGATION	100%	300.00	300.00	100%	300.00	0.69	0.43	0.92	2.75
64	1	A POINT OF VIEW RESEARCH, INC.	3080 S HARBOR BLVD	SANTA ANA	CA	92707	IRRIGATION	100%	1,259.00	1,259.00	100%	1,259.00	2.89	0.00	0.00	0.01
65	1	PROPERTY OWNER	701 E ALTON AVE	SANTA ANA	CA	92707	IRRIGATION	100%	266.00	266.00	100%	266.00	0.61	0.00	0.00	0.01
66	1	SAUSD	2802 S FLOWER ST	SANTA ANA	CA	92707	SCHOOL	75%	15,820.00	11,865.00	25%	3,955.00	9.07	5.63	12.10	36.30
67	1	SAUSD	600 W ALTON AVE	SANTA ANA	CA	92707	SCHOOL	75%	7,195.00	5,396.30	25%	1,798.75	4.13	2.56	5.50	16.51
68	1	CALVARY CHAPEL/SCHOOL	3800 S FAIRVIEW ST	SANTA ANA	CA	92707	SCHOOL	75%	8,392.00	6,294.00	25%	2,098.00	4.81	2.99	6.42	19.26
69	1	CALVARY CHAPEL OF COSTA MESA	3000 W MACARTHUR BLVD	SANTA ANA	CA	92707	SCHOOL	75%	3,695.00	2,771.30	25%	923.75	2.12	1.32	2.83	8.48
70	1	SANTA ANA UNIFIED SCHOOL DISTRICT	3529 S GREENVILLE ST	SANTA ANA	CA	92707	SCHOOL	75%	11.00	8.30	25%	2.75	0.01	0.00	0.01	0.03
71	1	GOGLANIAN BAKERIES	3401 W SEGERSTROM AVE	SANTA ANA	CA	92707	WHOLESALE FOOD	50%	12,124.00	6,062.00	20%	2,424.80	5.56	3.45	7.42	22.26
72	1	DANCO METAL SURF	401 W ROWLAND AVE	SANTA ANA	CA	92707	INDUS/DUMPT	50%	12,604.00	6,302.00	50%	6,302.00	14.46	8.97	19.28	57.85
73	1	OCEANSIDE INTERNATIONAL PROPERTIES	2901 W MACARTHUR BLVD	SANTA ANA	CA	92707	IRRIGATION	100%	2,748.00	2,748.00	100%	2,748.00	6.31	3.91	8.41	25.22
74	1	LAKE CENTER PARTNERS	3700 S SUSAN ST	SANTA ANA	CA	92707	IRRIGATION	100%	2,118.00	2,118.00	100%	2,118.00	4.86	3.01	6.48	19.44
75	1	VK MACARTHUR LLC	2701 W MACARTHUR BLVD	SANTA ANA	CA	92707	IRRIGATION	100%	1,749.00	1,749.00	100%	1,749.00	4.01	2.49	5.35	16.05
76	1	CALVARY CHAPEL OF COSTA MESA	3000 W MACARTHUR BLVD	SANTA ANA	CA	92707	SCHOOL	75%	1,231.67	923.75	75%	923.75	2.12	1.32	2.83	8.48
77	1	SANTA ANA UNIFIED SCHOOL DISTRICT	3529 S GREENVILLE ST	SANTA ANA	CA	92707	SCHOOL	75%	3.67	2.75	75%	2.75	0.01	0.00	0.01	0.03
78	1	ARMSTRONG RANCH	3328 S SHEFFIELD RD	SANTA ANA	CA	92707	IRRIGATION	100%	3,527.00	3,527.00	100%	3,527.00	8.09	5.02	10.79	32.38
79	1	METRO TOWN SQUARE IRRIGATION	3660 S BRISTOL ST	SANTA ANA	CA	92707	IRRIGATION	100%	3,342.00	3,342.00	100%	3,342.00	7.67	4.76	10.23	30.68
80	1	ARMSTRONG RANCH	3327 S SHEFFIELD RD	SANTA ANA	CA	92707	IRRIGATION	100%	3,039.00	3,039.00	100%	3,039.00	6.97	4.33	9.30	27.90
81	1	ARMSTRONG RANCH	3326 S SHEFFIELD RD	SANTA ANA	CA	92707	IRRIGATION	100%	1,962.00	1,962.00	100%	1,962.00	4.50	2.79	6.00	18.01
82	1	SAN SPR HM/ACT PRP M	1535 S RAITT ST	SANTA ANA	CA	92707	IRRIGATION	100%	1,417.00	1,417.00	100%	1,417.00	3.25	2.02	4.34	13.01
83	1	SAN SPR HM/ACT PRP M	1533 S RAITT ST	SANTA ANA	CA	92707	IRRIGATION	100%	1,354.00	1,354.00	100%	1,354.00	3.11	1.93	4.14	12.43
84	1	SAN SPR HM/ACT PRP M	1517 S RAITT ST	SANTA ANA	CA	92707	IRRIGATION	100%	986.00	986.00	100%	986.00	2.26	1.40	3.02	9.05
85	1	D & S INVESTMENTS LLC	3751 S HARBOR BLVD	SANTA ANA	CA	92707	IRRIGATION	100%	925.00	925.00	100%	925.00	2.12	1.32	2.83	8.49
86	1	BRISTOL CENTER HOLDINGS LP	1204 W MACARTHUR BLVD	SANTA ANA	CA	92707	IRRIGATION	100%	494.00	494.00	100%	494.00	1.13	0.70	1.51	4.54
87	1	WESTVALE TOWN HOMES	2125 W EDINGER AVE	SANTA ANA	CA	92707	IRRIGATION	100%	392.00	392.00	100%	392.00	0.90	0.56	1.20	3.60
88	1	LAS BRISAS H O A	2315 W EDINGER AVE	SANTA ANA	CA	92707	IRRIGATION	100%	384.00	384.00	100%	384.00	0.88	0.55	1.18	3.53
89	1	SO CO TERR/RPM	1001 W STEVENS AVE	SANTA ANA	CA	92707	IRRIGATION	100%	330.00	330.00	100%	330.00	0.76	0.47	1.01	3.03
90	1	3001 PACIFIC LLC	2330 W EDINGER AVE	SANTA ANA	CA	92707	IRRIGATION	100%	146.00	146.00	100%	146.00	0.33	0.21	0.45	1.34
91	1	TA CHEN ENTERPRISES	3019 W EDINGER AVE	SANTA ANA	CA	92707	IRRIGATION	100%	153.00	153.00	100%	153.00	0.35	0.22	0.47	1.40
92	1	CONVENIENCE RETAILERS, LLC	1913 W EDINGER AVE	SANTA ANA	CA	92707	IRRIGATION	100%	111.00	111.00	100%	111.00	0.25	0.16	0.34	1.02
93	1	IRWD	1704 W SEGERSTROM AVE	SANTA ANA	CA	92707	IRRIGATION	100%	26.00	26.00	100%	26.00	0.06	0.04	0.08	0.24
94	1	T-MOBILE WEST CORPORATION	2235 W STANFORD ST	SANTA ANA	CA	92707	IRRIGATION	100%	43.00	43.00	100%	43.00	0.10	0.00	0.01	0.02
95	1	SANTA ANA MEDIAN	3437 S BEAR ST	SANTA ANA	CA	92707	IRRIGATION	100%	105.00	105.00	100%	105.00	0.24	0.00	0.00	0.01
96	1	SAUSD	2301 W MACARTHUR AVE	SANTA ANA	CA	92707	SCHOOL	75%	2,848.67	2,136.50	75%	2,136.50	4.90	3.04	6.54	19.61
97	1	SAUSD	2250 S RAITT ST	SANTA ANA	CA	92707	SCHOOL	75%	1,036.00	777.00	75%	777.00	1.78	1.11	2.38	7.13
98	1	SAUSD	2120 W EDINGER AVE	SANTA ANA	CA	92707	SCHOOL	75%	1,693.33	1,270.00	75%	1,270.00	2.91	1.81	3.89	11.66
99	1	SAUSD	3600 S RAITT ST	SANTA ANA	CA	92707	SCHOOL	75%	916.00	687.00	75%	687.00	1.58	0.98	2.10	6.31

CITY OF SANTA ANA RECYCLED WATER MASTER PLAN
Potential Recycled Water Retrofit Sites by Phase

Site No.	Phase	Customer Name	Customer Address	City	State	Zip Code	Tax District	Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Domestic Water Annual Demand (BU/YR)	Potential Recycled Water Use (BU/YR)	Final Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Final Potential Recycled Water Demand (BU/YR)	Final Potential Recycled Water Demand (AFT/YR)	Average Daily Demand (ADD) GPM	Max Day Demand (MDD) GPM	Peak Hour Demand (PHD) GPM
100	1	SAUSD	2305 W EDINGER AVE	SANTA ANA	CA	92707	SCHOOL	75%	997.67	748.25	75%	748.25	1.72	1.07	2.29	6.87
101	1	SAUSD-MCFADDEN INTER SCHOOL	2701 S RAITT ST	SANTA ANA	CA	92707	SCHOOL	75%	603.33	452.50	75%	452.50	1.04	0.64	1.39	4.15
102	1	RANCHO SANTIAGO COMMUNITY COLLEGE D	2900 W EDINGER AVE	SANTA ANA	CA	92707	SCHOOL	75%	541.67	406.25	75%	406.25	0.93	0.58	1.24	3.73
103	1	VALLEY HI LITTLE LEAGUE	2045 W GLENWOOD PL	SANTA ANA	CA	92707	SCHOOL	75%	10.00	7.50	75%	7.50	0.02	0.01	0.02	0.07
104	1	VALLEY HIGH LITTLE LEAGUE	2045 W GLENWOOD PL	SANTA ANA	CA	92707	SCHOOL	75%	10.00	7.50	75%	7.50	0.02	0.01	0.02	0.07
105	1	WESTPORT SCHOOL	2129 W EDINGER AVE	SANTA ANA	CA	92707	SCHOOL	75%	35.00	26.25	75%	26.25	0.06	0.04	0.08	0.24
106	1	CENTENNIAL PARK	3000 W EDINGER AVE	SANTA ANA	CA	92707	CITY PARK	90%	24,430.00	21,987.00	90%	21,987.00	50.45	0.01	0.01	0.04
107	1	MAC ARTHUR VILLAGE	1040 W MACARTHUR BLVD	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	45,966.00	18,386.40	90%	18,386.40	42.19	13.08	28.13	84.39
108	1	ON THE LK VERSAILLES	3700 S PLAZA DR	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	35,805.00	14,322.00	90%	14,322.00	32.86	12.74	27.39	82.17
109	1	SC VILLAS	1001 W MACARTHUR BLVD	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	29,605.00	11,842.00	90%	11,842.00	27.17	10.53	22.65	67.94
110	1	PARK PLAZA II LTD	805 W STEVENS AVE	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	22,470.00	8,988.00	90%	8,988.00	20.62	7.99	17.19	51.56
111	1	FAR WEST MANAGEMENT CORP	1601 W MACARTHUR BLVD	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	47,536.00	19,014.40	90%	19,014.40	43.63	13.53	29.09	87.27
112	1	COURTYARD AT SC 192 ASSOC	3800 S FLOWER ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	17,502.00	7,000.80	90%	7,000.80	16.06	6.23	13.39	40.16
113	1	ST ALBANS HOA	3601 S BEAR ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	17,329.00	6,931.60	90%	6,931.60	15.90	4.93	10.60	31.81
114	1	THE PEARTREE APTS	3401 S PLAZA DR	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	9,515.00	3,806.00	90%	3,806.00	8.73	3.39	7.28	21.84
115	1	SO CO SPRING HOA	3600 S BEAR ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	9,124.00	3,649.60	90%	3,649.60	8.37	3.25	6.98	20.94
116	1	SOUTH COAST SPRINGS	3770 S BEAR ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	8,933.00	3,573.20	90%	3,573.20	8.20	3.18	6.83	20.50
117	1	SOUTH COAST RACQUET CLUB	1101 W STEVENS AVE	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	20,220.00	8,088.00	90%	8,088.00	18.56	2.88	6.19	18.56
118	1	CHELSEA COURT APTS	3500 S GREENVILLE ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	7,918.00	3,167.20	90%	3,167.20	7.27	2.82	6.06	18.17
119	1	WOODLAKE HOA	2528 W MACARTHUR BLVD	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	8,025.00	3,210.00	90%	3,210.00	7.37	2.86	6.14	18.42
120	1	WOODLAKE HOA	2500 W MACARTHUR BLVD	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	6,883.00	2,753.20	90%	2,753.20	6.32	2.45	5.27	15.80
121	1	CENTENNIAL PARK	3000 W EDINGER AVE	SANTA ANA	CA	92707	CITY PARK	90%	1,161.11	1,045.00	90%	1,045.00	2.40	1.49	3.20	9.59
122	1	CITY OF SANTA ANA MEDIAN	900 W MACARTHUR BLVD 1/2	SANTA ANA	CA	92707	IRRIGATION	100%	40.00	40.00	100%	40.00	0.09	0.06	0.12	0.37
123	1	CITY OF SANTA ANA MEDIAN	2010 W SEGERSTROM AVE	SANTA ANA	CA	92707	IRRIGATION	100%	1,541.00	1,541.00	100%	1,541.00	3.54	0.00	0.00	0.01
124	1	CITY OF SANTA ANA MEDIAN	3700 S BEAR ST 1/2	SANTA ANA	CA	92707	IRRIGATION	100%	271.00	271.00	100%	271.00	0.62	0.00	0.00	0.01
125	1	CITY OF SANTA ANA MEDIAN	4800 W EDINGER AVE 1/2	SANTA ANA	CA	92707	IRRIGATION	100%	228.00	228.00	100%	228.00	0.52	0.00	0.00	0.01
126	1	CITY OF SANTA ANA MEDIAN	1960 W ST GERTRUDE PL	SANTA ANA	CA	92707	IRRIGATION	100%	49.00	49.00	100%	49.00	0.11	0.00	0.00	0.01
127	1	CITY OF SANTA ANA MEDIAN	3431 S BEAR ST	SANTA ANA	CA	92707	IRRIGATION	100%	1,027.00	1,027.00	100%	1,027.00	2.36	0.38	0.81	2.43
129	1	THORNTON PARK	1801 W SEGERSTROM AVE	SANTA ANA	CA	92707	CITY PARK	90%	5,341.00	4,806.90	90%	4,806.90	11.03	6.84	14.71	44.12
130	1	ADAMS PARK	2302 S RAITT ST	SANTA ANA	CA	92707	CITY PARK	90%	156.00	140.40	90%	140.40	0.32	0.20	0.43	1.29
131	1	BOMO KORAL PARK	930 W MACARTHUR BLVD	SANTA ANA	CA	92707	CITY PARK	90%	2.00	1.80	90%	1.80	0.00	0.00	0.01	0.02
132	1	CENTENNIAL PARK SOCCER CNES	3000 W EDINGER AVE	SANTA ANA	CA	92707	CITY PARK	90%	141.00	126.90	90%	126.90	0.29	0.18	0.39	1.17
133	1	PACIFICARE HEALTH SYSTEMS CORP	3120 W LAKE CENTER DR	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	10,169.00	5,084.50	50%	5,084.50	11.67	7.24	15.56	46.67
134	1	ICON OWNER POOL 1 LA BUS. PARKS, LL	3601 W MACARTHUR BLVD	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	6,370.00	3,185.00	50%	3,185.00	7.31	4.53	9.75	29.24
135	1	OCEANSIDE INTERNATIONAL PROPERTIES	2901 W MACARTHUR BLVD	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	5,520.00	2,760.00	50%	2,760.00	6.33	3.93	8.45	25.34
136	1	SIGNATURE PARTY RENTALS	3100 S SUSAN ST	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	4,782.00	2,391.00	50%	2,391.00	5.49	3.40	7.32	21.95
137	1	WC SUNFLOWER OPS LLC	3730 S GREENVILLE ST	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	3,536.00	1,768.00	50%	1,768.00	4.06	2.52	5.41	16.23
138	1	OCFA #76	950 W MACARTHUR BLVD	SANTA ANA	CA	92707	GOVERNMENT	90%	253.00	227.70	90%	227.70	0.52	0.14	0.31	0.93
139	1	CHROMA SYSTEMS	3201 S SUSAN ST	SANTA ANA	CA	92707	INDUS/DUMPT	50%	149,667.00	74,833.50	50%	74,833.50	171.70	106.50	228.97	686.91
140	1	FAR WEST MANAGEMENT CORP	3627 S ASPEN VILLAGE WAY	SANTA ANA	CA	92707	IRRIGATION	100%	4,471.00	4,471.00	100%	4,471.00	10.26	6.36	13.68	41.04
141	1	BRE CA OFFICE OWNER LLC	3607 S HARBOR BLVD	SANTA ANA	CA	92707	IRRIGATION	100%	4,057.00	4,057.00	100%	4,057.00	9.31	5.77	12.41	37.24
													1,136.52			
1	2	FAIRVIEW VILLAS	801 S FAIRVIEW ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	74,282.00	29,712.80	20%	14,856.40	34.09	21.14	45.46	136.37
2	2	TOWN SQUARE OWNERS	601 W 1ST ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	39,705.00	15,882.00	20%	7,941.00	18.22	11.30	24.30	72.89
3	2	FAIRLANE GARDEN	631 S FAIRVIEW ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	25,461.00	10,184.40	20%	5,092.20	11.68	7.25	15.58	46.74
4	2	LINC-BRISTOL ASSOCIATES	2901 N BRISTOL ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	25,057.00	10,022.80	20%	5,011.40	11.50	7.13	15.33	46.00
5	2	SOLARE APARTMENTS SA, LLC	2111 W 17TH ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	20,040.00	8,016.00	25%	5,010.00	11.50	7.13	15.33	45.99

CITY OF SANTA ANA RECYCLED WATER MASTER PLAN

Potential Recycled Water Retrofit Sites by Phase

Site No.	Phase	Customer Name	Customer Address	City	State	Zip Code	Tax District	Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Domestic Water Annual Demand (BU/YR)	Potential Recycled Water Use (BU/YR)	Final Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Final Potential Recycled Water Demand (BU/YR)	Final Potential Recycled Water Demand (AFT/YR)	Average Daily Demand (ADD) GPM	Max Day Demand (MDD) GPM	Peak Hour Demand (PHD) GPM
6	2	REGENCY VILLAS HOA	1602 N KING ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	16,591.00	6,636.40	25%	4,147.75	9.52	5.90	12.69	38.07
7	2	PACIFICA GARDEN APTS LP	2833 N BRISTOL ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	13,527.00	5,410.80	25%	3,381.75	7.76	4.81	10.35	31.04
8	2	PACIFICA GARDEN APTS LP	2801 N BRISTOL ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	12,651.00	5,060.40	25%	3,162.75	7.26	4.50	9.68	29.03
9	2	CCHNC/FLOWER PARK PLAZA LP	901 W 1ST ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	11,741.00	4,696.40	25%	2,935.25	6.73	4.18	8.98	26.94
10	2	SHADOW WOOD	611 N BRISTOL ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	10,263.00	4,105.20	25%	2,565.75	5.89	3.65	7.85	23.55
11	2	ISLANDER APTS	2724 N BRISTOL ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	9,719.00	3,887.60	25%	2,429.75	5.58	3.46	7.43	22.30
12	2	SANTA ANA SENIOR HOUSING L P	401 W 1ST ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	11,794.00	4,717.60	20%	2,358.80	5.41	3.36	7.22	21.65
13	2	AG09-097	301 W 2ND ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	8,606.00	3,442.40	25%	2,151.50	4.94	3.06	6.58	19.75
14	2	PHILIP CASE	1610 N KING ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	8,458.00	3,383.20	25%	2,114.50	4.85	3.01	6.47	19.41
15	2	ADVANCED GROUP 01-76 FAIRVIEW APTS	2701 W MCFADDEN AVE	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	8,417.00	3,366.80	25%	2,104.25	4.83	3.00	6.44	19.32
16	2	CITY OF SANTA ANA MEDIAN	1000 W MEMORY LN 1/2	SANTA ANA	CA	92707	CITY IRRIGATION	100%	1,109.00	1,109.00	100%	1,109.00	2.54	1.58	3.39	10.18
17	2	CITY OF SANTA ANA	601 N BRISTOL ST 3/4	SANTA ANA	CA	92707	CITY IRRIGATION	100%	860.00	860.00	100%	860.00	1.97	1.22	2.63	7.89
18	2	CITY OF SANTA ANA MEDIAN	1219 E SANTA ANA BLVD	SANTA ANA	CA	92707	CITY IRRIGATION	100%	613.00	613.00	100%	613.00	1.41	0.87	1.88	5.63
19	2	CITY OF SANTA ANA PRCSA	1560 W MEMORY LN	SANTA ANA	CA	92707	CITY IRRIGATION	100%	378.00	378.00	100%	378.00	0.87	0.54	1.16	3.47
20	2	CITY OF SANTA ANA WELL #33	921 W WALNUT ST	SANTA ANA	CA	92707	CITY IRRIGATION	100%	147.00	147.00	100%	147.00	0.34	0.21	0.45	1.35
21	2	CITY OF SANTA ANA MEDIAN	400 N FAIRVIEW ST 1/2	SANTA ANA	CA	92707	CITY IRRIGATION	100%	162.00	162.00	100%	162.00	0.37	0.23	0.50	1.49
22	2	CITY OF SANTA ANA PW MAINTENANCE	1631 N BRISTOL ST 3/4	SANTA ANA	CA	92707	CITY IRRIGATION	100%	113.00	113.00	100%	113.00	0.26	0.16	0.35	1.04
23	2	CITY OF SANTA ANA MEDIAN	900 W 1ST ST 1/2	SANTA ANA	CA	92707	CITY IRRIGATION	100%	68.00	68.00	100%	68.00	0.16	0.10	0.21	0.62
24	2	CITY OF SANTA ANA MEDIAN	800 S FAIRVIEW ST 1/2	SANTA ANA	CA	92707	CITY IRRIGATION	100%	19.00	19.00	100%	19.00	0.04	0.03	0.06	0.17
25	2	CITY OF SANTA ANA MEDIAN	200 N BROADWAY ST 1/2	SANTA ANA	CA	92707	CITY IRRIGATION	100%	17.00	17.00	100%	17.00	0.04	0.02	0.05	0.16
26	2	CITY OF SANTA ANA DIVIDER	1615 N LOUISE ST	SANTA ANA	CA	92707	CITY IRRIGATION	100%	16.00	16.00	100%	16.00	0.04	0.02	0.05	0.15
27	2	CITY OF SANTA ANA MEDIAN	600 W 1ST ST 1/2	SANTA ANA	CA	92707	CITY IRRIGATION	100%	16.00	16.00	100%	16.00	0.04	0.02	0.05	0.15
28	2	CITY OF SANTA ANA ENTRY PRTL	201 S CYPRESS AVE	SANTA ANA	CA	92707	CITY IRRIGATION	100%	17.00	17.00	100%	17.00	0.04	0.02	0.05	0.16
29	2	CITY OF SANTA ANA MEDIAN	500 S FAIRVIEW ST 1/2	SANTA ANA	CA	92707	CITY IRRIGATION	100%	6.00	6.00	100%	6.00	0.01	0.01	0.02	0.06
30	2	CITY OF SANTA ANA MEDIAN	2907 N BRISTOL ST 1/2	SANTA ANA	CA	92707	CITY IRRIGATION	100%	67.00	67.00	100%	67.00	0.15	0.00	0.01	0.02
31	2	CITY OF SANTA ANA ENTRY PRTL	1300 W PARK LN 1/2	SANTA ANA	CA	92707	CITY IRRIGATION	100%	32.00	32.00	100%	32.00	0.07	0.00	0.00	0.01
32	2	CITY OF SANTA ANA MEDIAN	1300 S FAIRVIEW ST 1/2	SANTA ANA	CA	92707	CITY IRRIGATION	100%	957.00	957.00	100%	957.00	2.20	0.00	0.00	0.01
33	2	CITY OF SANTA ANA MEDIAN	1031 W 17TH ST	SANTA ANA	CA	92707	CITY IRRIGATION	100%	286.00	286.00	100%	286.00	0.66	0.00	0.00	0.01
34	2	CITY OF SANTA ANA MEDIAN	1314 W 17TH ST	SANTA ANA	CA	92707	CITY IRRIGATION	100%	167.00	167.00	100%	167.00	0.38	0.00	0.00	0.01
35	2	CITY OF SANTA ANA MEDIAN	200 N FAIRVIEW ST 1/2	SANTA ANA	CA	92707	CITY IRRIGATION	100%	112.00	112.00	100%	112.00	0.26	0.00	0.00	0.01
36	2	CITY OF SANTA ANA MEDIAN	2489 N RIVERSIDE AVE 3/4	SANTA ANA	CA	92707	CITY IRRIGATION	100%	49.00	49.00	100%	49.00	0.11	0.00	0.00	0.01
37	2	CITY OF SANTA ANA MEDIAN	2800 W WILLITS ST 1/2	SANTA ANA	CA	92707	CITY IRRIGATION	100%	44.00	44.00	100%	44.00	0.10	0.00	0.00	0.01
38	2	CITY OF SANTA ANA MEDIAN	2800 W HIGHLAND AVE	SANTA ANA	CA	92707	CITY IRRIGATION	100%	68.00	68.00	100%	68.00	0.16	0.00	0.00	0.01
39	2	CITY OF SANTA ANA MEDIAN	420 N BROADWAY ST 1/2	SANTA ANA	CA	92707	CITY IRRIGATION	100%	35.00	35.00	100%	35.00	0.08	0.00	0.00	0.01
40	2	CITY OF SANTA ANA MEDIAN	924 N FLOWER ST 1/2	SANTA ANA	CA	92707	CITY IRRIGATION	100%	83.00	83.00	100%	83.00	0.19	0.00	0.00	0.01
41	2	CITY OF SANTA ANA MEDIAN	2623 W 1ST ST	SANTA ANA	CA	92707	CITY IRRIGATION	100%	61.00	61.00	100%	61.00	0.14	0.00	0.00	0.01
42	2	CITY OF SANTA ANA CITY HALL	600 W CIVIC CENTER DR W	SANTA ANA	CA	92707	CITY OWNED PROPERTY	90%	8,573.00	7,715.70	40%	3,429.20	7.87	4.88	10.49	31.48
43	2	STADIUM PARKING STRUCTURE	1020 W CIVIC CENTER DR W	SANTA ANA	CA	92707	CITY OWNED PROPERTY	90%	1,984.00	1,785.60	40%	793.60	1.82	1.13	2.43	7.29
44	2	CITY OF SANTA ANA POLICE STA	60 CIVIC CENTER PLZ	SANTA ANA	CA	92707	CITY OWNED PROPERTY	90%	23,593.00	21,233.70	40%	9,437.20	21.65	13.43	28.88	86.63
45	2	OCFA #71	1029 W 17TH ST	SANTA ANA	CA	92707	CITY OWNED PROPERTY	90%	485.00	436.50	40%	194.00	0.45	0.28	0.59	1.78
46	2	CITY OF SANTA ANA ROSS ANNEX	24 CIVIC CENTER PLZ	SANTA ANA	CA	92707	CITY OWNED PROPERTY	90%	1,479.00	1,331.10	40%	591.60	1.36	0.84	1.81	5.43
47	2	CITY OF SANTA ANA LIBRARY	26 CIVIC CENTER PLZ	SANTA ANA	CA	92707	CITY OWNED PROPERTY	90%	811.00	729.90	40%	324.40	0.74	0.46	0.99	2.98
48	2	CITY OF SANTA ANA DOWNTOWN MAINTENA	215 W 2ND ST	SANTA ANA	CA	92707	CITY OWNED PROPERTY	90%	6.00	5.40	40%	2.40	0.01	0.00	0.01	0.02
49	2	CITY OF SANTA ANA	690 W CIVIC CENTER DR W	SANTA ANA	CA	92707	CITY OWNED PROPERTY	90%	48.00	43.20	40%	19.20	0.04	0.03	0.06	0.18
50	2	CITY OF SANTA ANA MEDIAN	500 N FAIRVIEW ST 1/2	SANTA ANA	CA	92707	CITY OWNED PROPERTY	90%	266.00	239.40	40%	106.40	0.24	0.00	0.00	0.00
51	2	CITY OF SANTA ANA YMCA BLDG	205 W CIVIC CENTER DR W	SANTA ANA	CA	92707	CITY OWNED PROPERTY	90%	43.00	38.70	40%	17.20	0.04	0.00	0.00	0.00
52	2	COMMUNITY DEVELOPMENT	209 W CIVIC CENTER DR W	SANTA ANA	CA	92707	CITY OWNED PROPERTY	90%	43.00	38.70	40%	17.20	0.04	0.00	0.00	0.00
53	2	CITY OF SANTA ANA MEDIAN	1147 W 17TH ST	SANTA ANA	CA	92707	CITY OWNED PROPERTY	90%	540.00	486.00	40%	216.00	0.50	0.00	0.00	0.00
54	2	COUNTY JAIL IRRIGATION	1029 W SANTA ANA BLVD	SANTA ANA	CA	92707	CITY PARK	90%	7,184.00	6,465.60	90%	6,465.60	14.84	9.20	19.78	59.35

CITY OF SANTA ANA RECYCLED WATER MASTER PLAN

Potential Recycled Water Retrofit Sites by Phase

Site No.	Phase	Customer Name	Customer Address	City	State	Zip Code	Tax District	Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Domestic Water Annual Demand (BU/YR)	Potential Recycled Water Use (BU/YR)	Final Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Final Potential Recycled Water Demand (BU/YR)	Final Potential Recycled Water Demand (AFT/YR)	Average Daily Demand (ADD) GPM	Max Day Demand (MDD) GPM	Peak Hour Demand (PHD) GPM
55	2	MORRISON PARK	2801 N WESTWOOD AVE	SANTA ANA	CA	92707	CITY PARK	90%	3,504.00	3,153.60	90%	3,153.60	7.24	4.49	9.65	28.95
56	2	BIRCH PARK	210 N BIRCH ST	SANTA ANA	CA	92707	CITY PARK	90%	2,300.00	2,070.00	90%	2,070.00	4.75	2.95	6.33	19.00
57	2	FLOWER ST PARK	902 W 3RD ST	SANTA ANA	CA	92707	CITY PARK	90%	1,447.00	1,302.30	90%	1,302.30	2.99	1.85	3.99	11.95
58	2	SASSCER PARK	400 N ROSS ST	SANTA ANA	CA	92707	CITY PARK	90%	1,506.00	1,355.40	90%	1,355.40	3.11	1.93	4.15	12.44
59	2	STADIUM	907 W 6TH ST	SANTA ANA	CA	92707	CITY PARK	90%	1,341.00	1,206.90	90%	1,206.90	2.77	1.72	3.69	11.08
60	2	COURTHOUSE IRRIGATION	209 W SANTA ANA BLVD	SANTA ANA	CA	92707	CITY PARK	90%	965.00	868.50	90%	868.50	1.99	1.24	2.66	7.97
61	2	CITY OF SANTA ANA CRTHSE IRRI	631 N BROADWAY ST	SANTA ANA	CA	92707	CITY PARK	90%	526.00	473.40	90%	473.40	1.09	0.67	1.45	4.35
62	2	CITY OF SANTA ANA MEDIAN	203 W CIVIC CENTER DR W	SANTA ANA	CA	92707	CITY PARK	90%	103.00	92.70	90%	92.70	0.21	0.13	0.28	0.85
63	2	STADIUM PARKING STRUCTURE	1020 W CIVIC CENTER DR W	SANTA ANA	CA	92707	CITY PARK	90%	81.00	72.90	90%	72.90	0.17	0.10	0.22	0.67
64	2	ARTHUR DEMIRCHYAN	202 E 1ST ST	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	12,408.00	6,204.00	50%	6,204.00	14.23	8.83	18.98	56.95
65	2	FAIRVIEW EXPRESS PARTNERS, L.P.	1003 S FAIRVIEW ST	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	6,045.00	3,022.50	50%	3,022.50	6.94	4.30	9.25	27.74
66	2	THOMAS A SCIMECA	2220 W CAPE COD WAY	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	4,062.00	2,031.00	50%	2,031.00	4.66	2.89	6.21	18.64
67	2	GOODWILL INDUSTRIES	410 N FAIRVIEW ST	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	3,552.00	1,776.00	50%	1,776.00	4.07	2.53	5.43	16.30
68	2	CF SANTAANA LLC	801 W CIVIC CENTER DR	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	3,512.00	1,756.00	50%	1,756.00	4.03	2.50	5.37	16.12
69	2	COUNTY OF ORANGE	3102 N HESPERIAN ST	SANTA ANA	CA	92707	GOVERNMENT	90%	10,654.00	9,588.60	40%	4,261.60	9.78	6.07	13.04	39.12
70	2	COUNTY OF ORANGE	525 N FLOWER ST	SANTA ANA	CA	92707	GOVERNMENT	90%	50,702.00	45,631.80	40%	20,280.80	46.53	28.86	62.05	186.16
71	2	COUNTY OF ORANGE	550 N FLOWER ST	SANTA ANA	CA	92707	GOVERNMENT	90%	134,476.00	121,028.40	40%	53,790.40	123.42	76.55	164.59	493.75
72	2	COUNTY OF ORANGE	511 N FLOWER ST	SANTA ANA	CA	92707	GOVERNMENT	90%	22,073.00	19,865.70	40%	8,829.20	20.26	12.57	27.02	81.05
73	2	RONALD REAGAN FED COURTHOUSE	411 W 4TH ST	SANTA ANA	CA	92707	GOVERNMENT	90%	4,160.00	3,744.00	40%	1,664.00	3.82	2.37	5.09	15.27
74	2	COUNTY OF ORANGE	400 W SANTA ANA BLVD	SANTA ANA	CA	92707	GOVERNMENT	90%	2,856.00	2,570.40	40%	1,142.40	2.62	1.63	3.50	10.49
75	2	COUNTY OF ORANGE	1725 W 17TH ST	SANTA ANA	CA	92707	GOVERNMENT	90%	2,992.00	2,692.80	40%	1,196.80	2.75	1.70	3.66	10.99
76	2	COUNTY OF ORANGE	700 W CIVIC CENTER DR W	SANTA ANA	CA	92707	GOVERNMENT	90%	7,954.00	7,158.60	40%	3,181.60	7.30	4.53	9.74	29.21
77	2	ADMINISTRATIVE OFFICE OF THE COURT	601 W SANTA ANA BLVD	SANTA ANA	CA	92707	GOVERNMENT	90%	2,362.00	2,125.80	40%	944.80	2.17	1.35	2.89	8.67
78	2	COUNTY OF ORANGE	300 N FLOWER ST	SANTA ANA	CA	92707	GOVERNMENT	90%	2,416.00	2,174.40	40%	966.40	2.22	1.38	2.96	8.87
79	2	COUNTY OF ORANGE	630 N BROADWAY ST	SANTA ANA	CA	92707	GOVERNMENT	90%	2,746.00	2,471.40	40%	1,098.40	2.52	1.56	3.36	10.08
80	2	COUNTY OF ORANGE	320 N FLOWER ST	SANTA ANA	CA	92707	GOVERNMENT	90%	2,375.00	2,137.50	40%	950.00	2.18	1.35	2.91	8.72
81	2	COUNTY OF ORANGE	333 W SANTA ANA BLVD	SANTA ANA	CA	92707	GOVERNMENT	90%	1,211.00	1,089.90	40%	484.40	1.11	0.69	1.48	4.45
82	2	COUNTY OF ORANGE	1729 W 17TH ST	SANTA ANA	CA	92707	GOVERNMENT	90%	1,124.00	1,011.60	40%	449.60	1.03	0.64	1.38	4.13
83	2	DEPT GEN SER B & G	28 CIVIC CENTER PLZ	SANTA ANA	CA	92707	GOVERNMENT	90%	1,326.00	1,193.40	40%	530.40	1.22	0.76	1.62	4.87
84	2	OCFA #75	120 W WALNUT ST	SANTA ANA	CA	92707	GOVERNMENT	90%	409.00	368.10	40%	163.60	0.38	0.23	0.50	1.50
85	2	COUNTY OF ORANGE	515 N FLOWER ST	SANTA ANA	CA	92707	GOVERNMENT	90%	448.00	403.20	40%	179.20	0.41	0.26	0.55	1.65
86	2	COUNTY OF ORANGE	611 N BROADWAY ST	SANTA ANA	CA	92707	GOVERNMENT	90%	578.00	520.20	40%	231.20	0.53	0.33	0.71	2.12
87	2	COUNTY OF ORANGE	1071 W SANTA ANA BLVD	SANTA ANA	CA	92707	GOVERNMENT	90%	310.00	279.00	40%	124.00	0.28	0.18	0.38	1.14
88	2	COUNTY OF ORANGE	645 N ROSS ST	SANTA ANA	CA	92707	GOVERNMENT	90%	317.00	285.30	40%	126.80	0.29	0.18	0.39	1.16
89	2	COUNTY OF ORANGE	601 N ROSS ST	SANTA ANA	CA	92707	GOVERNMENT	90%	88.00	79.20	40%	35.20	0.08	0.05	0.11	0.32
90	2	ZAROO EXPRESS SANTA ANA, LLC	1205 W 17TH ST	SANTA ANA	CA	92707	INDUS/DUMPT	50%	5,801.00	2,900.50	50%	2,900.50	6.66	4.13	8.88	26.62
91	2	CALTRANS	3023 N HESPERIAN ST	SANTA ANA	CA	92707	IRRIGATION	100%	7,957.00	7,957.00	100%	7,957.00	18.26	11.32	24.35	73.04
92	2	CALTRAN ID#12-071614	3091 N BRISTOL ST	SANTA ANA	CA	92707	IRRIGATION	100%	3,118.00	3,118.00	100%	3,118.00	7.15	4.44	9.54	28.62
93	2	RIVERGLEN HOMES IRRIGATION	2845 N AUGUSTA WAY	SANTA ANA	CA	92707	IRRIGATION	100%	2,862.00	2,862.00	100%	2,862.00	6.57	4.07	8.76	26.27
94	2	GGF BRISTOL LLC	1702 N BRISTOL ST	SANTA ANA	CA	92707	IRRIGATION	100%	2,605.00	2,605.00	100%	2,605.00	5.98	3.71	7.97	23.91
95	2	GGF BRISTOL LLC	1439 W 17TH ST	SANTA ANA	CA	92707	IRRIGATION	100%	2,000.00	2,000.00	100%	2,000.00	4.59	2.85	6.12	18.36
96	2	RONALD REAGAN FED COURTHOUSE	411 W 4TH ST	SANTA ANA	CA	92707	IRRIGATION	100%	1,757.00	1,757.00	100%	1,757.00	4.03	2.50	5.38	16.13
97	2	JOHN LAING HOMES	2853 W EDINGER AVE 1/2	SANTA ANA	CA	92707	IRRIGATION	100%	1,657.00	1,657.00	100%	1,657.00	3.80	2.36	5.07	15.21
98	2	AMCAL GENERAL CONTRACTORS INC	1600 W MEMORY LN 3/4	SANTA ANA	CA	92707	IRRIGATION	100%	1,186.00	1,186.00	100%	1,186.00	2.72	1.69	3.63	10.89
99	2	FAIRVIEW TOWNHOMES	168 S FAIRVIEW ST	SANTA ANA	CA	92707	IRRIGATION	100%	1,145.00	1,145.00	100%	1,145.00	2.63	1.63	3.50	10.51
100	2	17 TH STREET LLC	802 W 17TH ST	SANTA ANA	CA	92707	IRRIGATION	100%	584.00	584.00	100%	584.00	1.34	0.83	1.79	5.36
101	2	GGF BRISTOL LLC	1545 W 17TH ST 1/2	SANTA ANA	CA	92707	IRRIGATION	100%	561.00	561.00	100%	561.00	1.29	0.80	1.72	5.15
102	2	ARTISTS WALK CORPORATION	240 N BUSH ST	SANTA ANA	CA	92707	IRRIGATION	100%	468.00	468.00	100%	468.00	1.07	0.67	1.43	4.30
103	2	ARTISTS WALK CORPORATION	221 N BUSH ST 3/4	SANTA ANA	CA	92707	IRRIGATION	100%	359.00	359.00	100%	359.00	0.82	0.51	1.10	3.30

CITY OF SANTA ANA RECYCLED WATER MASTER PLAN

Potential Recycled Water Retrofit Sites by Phase

Site No.	Phase	Customer Name	Customer Address	City	State	Zip Code	Tax District	Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Domestic Water Annual Demand (BU/YR)	Potential Recycled Water Use (BU/YR)	Final Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Final Potential Recycled Water Demand (BU/YR)	Final Potential Recycled Water Demand (AFT/YR)	Average Daily Demand (ADD) GPM	Max Day Demand (MDD) GPM	Peak Hour Demand (PHD) GPM
104	2	CIVIC CENTER BUSINESS P	503 N FAIRVIEW ST	SANTA ANA	CA	92707	IRRIGATION	100%	350.00	350.00	100%	350.00	0.80	0.50	1.07	3.21
105	2	GOODWILL INDUSTRIES	200 N FAIRVIEW ST	SANTA ANA	CA	92707	IRRIGATION	100%	302.00	302.00	100%	302.00	0.69	0.43	0.92	2.77
106	2	SANTA ANA WBBB	219 S BIRCH ST 3/4	SANTA ANA	CA	92707	IRRIGATION	100%	293.00	293.00	100%	293.00	0.67	0.42	0.90	2.69
107	2	BMPBTC LLC	1800 N BRISTOL ST	SANTA ANA	CA	92707	IRRIGATION	100%	271.00	271.00	100%	271.00	0.62	0.39	0.83	2.49
108	2	ORANGE COUNTY CREDIT UNION	841 N VAN NESS AVE	SANTA ANA	CA	92707	IRRIGATION	100%	222.00	222.00	100%	222.00	0.51	0.32	0.68	2.04
109	2	GOODWILL INDUSTRIES	410 N FAIRVIEW ST 3/4	SANTA ANA	CA	92707	IRRIGATION	100%	202.00	202.00	100%	202.00	0.46	0.29	0.62	1.85
110	2	RED MOUNTAIN RETAIL GROUP INC	2725 N BRISTOL ST	SANTA ANA	CA	92707	IRRIGATION	100%	198.00	198.00	100%	198.00	0.45	0.28	0.61	1.82
111	2	EL RINCON CHILANGO	1133 W 17TH ST	SANTA ANA	CA	92707	IRRIGATION	100%	189.00	189.00	100%	189.00	0.43	0.27	0.58	1.74
112	2	JAMES C COGHLAN	1701 N ALONA ST	SANTA ANA	CA	92707	IRRIGATION	100%	177.00	177.00	100%	177.00	0.41	0.25	0.54	1.63
113	2	CV-SANTA ANA LOFTS MAINTENANCE CORP	241 N SYCAMORE ST 1/2	SANTA ANA	CA	92707	IRRIGATION	100%	160.00	160.00	100%	160.00	0.37	0.23	0.49	1.47
114	2	BRISTOL PARK MEDICAL	1212 W 17TH ST	SANTA ANA	CA	92707	IRRIGATION	100%	150.00	150.00	100%	150.00	0.34	0.21	0.46	1.38
115	2	PARKVIEW TOWNHOMES	2779 W EDINGER AVE	SANTA ANA	CA	92707	IRRIGATION	100%	141.00	141.00	100%	141.00	0.32	0.20	0.43	1.29
116	2	VILLA SANTA ANA H O	1030 W SANTA ANA BLVD	SANTA ANA	CA	92707	IRRIGATION	100%	99.00	99.00	100%	99.00	0.23	0.14	0.30	0.91
117	2	LAYNE BALLARD	1040 W SANTA ANA BLVD	SANTA ANA	CA	92707	IRRIGATION	100%	74.00	74.00	100%	74.00	0.17	0.11	0.23	0.68
118	2	POLITISKI ROBERT	835 N PARTON ST	SANTA ANA	CA	92707	IRRIGATION	100%	43.00	43.00	100%	43.00	0.10	0.00	0.00	0.01
119	2	JOHN LAING HOMES	2855 W EDINGER AVE 1/2	SANTA ANA	CA	92707	IRRIGATION	100%	43.00	43.00	100%	43.00	0.10	0.00	0.00	0.01
120	2	RANCHO SANTIAGO COMMUNITY COLLEGE D	1606 N BRISTOL ST	SANTA ANA	CA	92707	SCHOOL	75%	17,835.00	13,376.30	25%	4,458.75	10.23	6.35	13.64	40.93
121	2	SAUSD	2701 W 5TH ST	SANTA ANA	CA	92707	SCHOOL	75%	16,332.00	12,249.00	25%	4,083.00	9.37	5.81	12.49	37.48
122	2	SAUSD-SANTA ANA HIGH SCHOOL	401 S PARTON ST	SANTA ANA	CA	92707	SCHOOL	75%	10,307.00	7,730.30	25%	2,576.75	5.91	3.67	7.88	23.65
123	2	SANTA ANA COLLEGE	1530 W 17TH ST	SANTA ANA	CA	92707	SCHOOL	75%	12,912.00	9,684.00	25%	3,228.00	7.41	4.59	9.88	29.63
124	2	SAUSD	1900 N BRISTOL ST	SANTA ANA	CA	92707	SCHOOL	75%	6,798.00	5,098.50	25%	1,699.50	3.90	2.42	5.20	15.60
125	2	SAUSD	417 W WALNUT ST	SANTA ANA	CA	92707	SCHOOL	75%	3,146.00	2,359.50	25%	786.50	1.80	1.12	2.41	7.22
126	2	SAUSD	1401 W SANTA ANA BLVD	SANTA ANA	CA	92707	SCHOOL	75%	2,685.00	2,013.80	25%	671.25	1.54	0.96	2.05	6.16
127	2	NEWSONG COMMUNITY CHURCH	1014 W 17TH ST	SANTA ANA	CA	92707	SCHOOL	75%	2,152.00	1,614.00	25%	538.00	1.23	0.77	1.65	4.94
128	2	SAUSD	1111 W CIVIC CENTER DR W	SANTA ANA	CA	92707	SCHOOL	75%	1,707.00	1,280.30	25%	426.75	0.98	0.61	1.31	3.92
129	2	SAUSD	719 W WALNUT ST	SANTA ANA	CA	92707	SCHOOL	75%	1,180.00	885.00	25%	295.00	0.68	0.42	0.90	2.71
130	2	SAUSD	817 W WALNUT ST	SANTA ANA	CA	92707	SCHOOL	75%	566.00	424.50	25%	141.50	0.32	0.20	0.43	1.30
131	2	SAUSD	1512 W SANTA ANA BLVD	SANTA ANA	CA	92707	SCHOOL	75%	469.00	351.80	25%	117.25	0.27	0.17	0.36	1.08
132	2	RANCHO SANTIAGO COMMUNITY COLLEGE D	1530 W 17TH ST	SANTA ANA	CA	92707	SCHOOL	75%	502.00	376.50	25%	125.50	0.29	0.18	0.38	1.15
133	2	SAUSD	730 W WALNUT ST	SANTA ANA	CA	92707	SCHOOL	75%	399.00	299.30	25%	99.75	0.23	0.14	0.31	0.92
134	2	SAUSD	520 W WALNUT ST	SANTA ANA	CA	92707	SCHOOL	75%	130.00	97.50	25%	32.50	0.07	0.05	0.10	0.30
135	2	RANCHO SANTIAGO COMMUNITY COLLEGE D	1720 W 17TH ST	SANTA ANA	CA	92707	SCHOOL	75%	72.00	54.00	25%	18.00	0.04	0.03	0.06	0.17
136	2	JOHN LAING HOMES	2853 W EDINGER AVE 1/2	SANTA ANA	CA	92707	IRRIGATION	100%	1,657.00	1,657.00	100%	1,657.00	3.80	2.36	5.07	15.21
137	2	PARKVIEW TOWNHOMES	2779 W EDINGER AVE	SANTA ANA	CA	92707	IRRIGATION	100%	141.00	141.00	100%	141.00	0.32	0.20	0.43	1.29
138	2	JOHN LAING HOMES	2855 W EDINGER AVE 1/2	SANTA ANA	CA	92707	IRRIGATION	100%	43.00	43.00	100%	43.00	0.10	0.00	0.00	0.01
												623.20				
1	3	WARWICK SQUARE ASSOC INC	710 S LYON ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	49,598.00	19,839.20	20%	9,919.60	22.76	14.12	30.35	91.05
2	3	REDWOODS HOMEOWNERS	1001 N MABURY ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	27,102.00	10,840.80	20%	5,420.40	12.44	7.71	16.59	49.76
3	3	BDP LAS FUENTES, LLC	727 S LYON ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	20,752.00	8,300.80	25%	5,188.00	11.90	7.38	15.87	47.62
4	3	LK DIANE/SATELLITE M	750 N PARK CENTER DR	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	25,730.00	10,292.00	20%	5,146.00	11.81	7.32	15.75	47.24
5	3	SADDLEBACK PARK VILL	521 S LYON ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	20,358.00	8,143.20	25%	5,089.50	11.68	7.24	15.57	46.72
6	3	MONTEREY VILLAS MAINTENANCE ASSOCIA	1345 N CABRILLO PARK DR	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	21,039.00	8,415.60	20%	4,207.80	9.65	5.99	12.88	38.62
7	3	CABRILLO PARK HOA/ACT	1400 N CABRILLO PARK DR	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	21,029.00	8,411.60	20%	4,205.80	9.65	5.99	12.87	38.61
8	3	THE MONTEREY APARTMENTS	1750 N SHERRY LN	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	10,028.00	4,011.20	25%	2,507.00	5.75	3.57	7.67	23.01
9	3	VILLAGE MEADOWS PROP MGMT	801 S LYON ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	7,500.00	3,000.00	25%	1,875.00	4.30	2.67	5.74	17.21
10	3	CITY OF SANTA ANA MEDIAN	2882 N MAIN ST 1/2	SANTA ANA	CA	92707	CITY IRRIGATION	100%	393.00	393.00	100%	393.00	0.90	0.56	1.20	3.61
11	3	CITY OF SANTA ANA MEDIAN	1000 N CABRILLO PARK DR 1/2	SANTA ANA	CA	92707	CITY IRRIGATION	100%	400.00	400.00	100%	400.00	0.92	0.10	0.22	0.65

CITY OF SANTA ANA RECYCLED WATER MASTER PLAN

Potential Recycled Water Retrofit Sites by Phase

Site No.	Phase	Customer Name	Customer Address	City	State	Zip Code	Tax District	Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Domestic Water Annual Demand (BU/YR)	Potential Recycled Water Use (BU/YR)	Final Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Final Potential Recycled Water Demand (BU/YR)	Final Potential Recycled Water Demand (AFT/YR)	Average Daily Demand (ADD) GPM	Max Day Demand (MDD) GPM	Peak Hour Demand (PHD) GPM
12	3	CITY OF SANTA ANA MEDIAN	800 N CABRILLO PARK DR 1/2	SANTA ANA	CA	92707	CITY IRRIGATION	100%	463.00	463.00	100%	463.00	1.06	0.04	0.09	0.26
13	3	CITY OF SANTA ANA MEDIAN	1751 E 4TH ST	SANTA ANA	CA	92707	CITY IRRIGATION	100%	538.00	538.00	100%	538.00	1.23	0.01	0.02	0.07
14	3	CITY OF SANTA ANA MEDIAN	400 W DYER RD 1/2	SANTA ANA	CA	92707	CITY IRRIGATION	100%	629.00	629.00	100%	629.00	1.44	0.00	0.01	0.02
15	3	CITY OF SANTA ANA	1640 E EDINGER AVE 1/2	SANTA ANA	CA	92707	CITY IRRIGATION	100%	52.00	52.00	100%	52.00	0.12	0.00	0.00	0.01
16	3	CITY OF SANTA ANA MEDIAN	500 W DYER RD 1/2	SANTA ANA	CA	92707	CITY IRRIGATION	100%	232.00	232.00	100%	232.00	0.53	0.00	0.00	0.01
17	3	CITY OF SANTA ANA MEDIAN	1500 N CABRILLO PARK DR 1/2	SANTA ANA	CA	92707	CITY IRRIGATION	100%	366.00	366.00	100%	366.00	0.84	0.00	0.00	0.01
18	3	CITY OF SANTA ANA MEDIAN	1600 E EDINGER AVE 1/2	SANTA ANA	CA	92707	CITY IRRIGATION	100%	46.00	46.00	100%	46.00	0.11	0.00	0.00	0.01
19	3	CITY OF SANTA ANA MEDIAN	1900 E 4TH ST 1/2	SANTA ANA	CA	92707	CITY IRRIGATION	100%	20.00	20.00	100%	20.00	0.05	0.00	0.00	0.01
20	3	CITY OF SANTA ANA MEDIAN	1704 E EDINGER AVE	SANTA ANA	CA	92707	CITY IRRIGATION	100%	92.00	92.00	100%	92.00	0.21	0.00	0.00	0.01
21	3	CITY OF SANTA ANA MEDIAN	2775 N MAIN ST	SANTA ANA	CA	92707	CITY IRRIGATION	100%	109.00	109.00	100%	109.00	0.25	0.00	0.00	0.01
22	3	OCFA #72	1688 E 4TH ST	SANTA ANA	CA	92707	CITY OWNED PROPERTY	90%	143.00	128.70	40%	57.20	0.13	0.08	0.18	0.53
23	3	ALTON BIKE TRAIL E OF FLOWER	214 E ADAMS ST	SANTA ANA	CA	92707	CITY OWNED PROPERTY	90%	43.00	43.00	40%	43.00	0.10	0.00	0.00	0.00
24	3	SANTA ANA ZOO	1721 E CHESTNUT AVE	SANTA ANA	CA	92707	CITY PARK	90%	11,464.00	10,317.60	90%	10,317.60	23.67	14.68	31.57	94.71
25	3	PORTOLA PARK	1700 E SANTA CLARA AVE	SANTA ANA	CA	92707	CITY PARK	90%	7,916.00	7,124.40	90%	7,124.40	16.35	10.14	21.80	65.40
26	3	CABRILLO PARK	1820 E FRUIT ST	SANTA ANA	CA	92707	CITY PARK	90%	5,496.00	4,946.40	90%	4,946.40	11.35	7.04	15.14	45.40
27	3	DELHI PARK	505 E CENTRAL AVE	SANTA ANA	CA	92707	CITY PARK	90%	3,848.00	3,463.20	90%	3,463.20	7.95	4.93	10.60	31.79
28	3	MABURY PARK	1801 E FRUIT ST	SANTA ANA	CA	92707	CITY PARK	90%	3,707.00	3,336.30	90%	3,336.30	7.66	4.75	10.21	30.63
29	3	MABURY PARK	1301 N MABURY ST	SANTA ANA	CA	92707	CITY PARK	90%	2,638.00	2,374.20	90%	2,374.20	5.45	3.38	7.26	21.79
30	3	DELHI PARK	2314 S HALLADAY ST	SANTA ANA	CA	92707	CITY PARK	90%	1,987.00	1,788.30	90%	1,788.30	4.10	2.55	5.47	16.42
31	3	CABRILLO TENNIS CENTER	721 N SHERRY LN	SANTA ANA	CA	92707	CITY PARK	90%	1,281.00	1,152.90	90%	1,152.90	2.65	1.64	3.53	10.58
32	3	BIKE TRAIL	322 E CENTRAL AVE	SANTA ANA	CA	92707	CITY PARK	90%	861.00	774.90	90%	774.90	1.78	1.10	2.37	7.11
33	3	PRENTICE PARK	1700 E 1ST ST	SANTA ANA	CA	92707	CITY PARK	90%	605.00	544.50	90%	544.50	1.25	0.78	1.67	5.00
34	3	SANTIAGO PARK	2535 N MAIN ST	SANTA ANA	CA	92707	CITY PARK	90%	672.00	604.80	90%	604.80	1.39	0.86	1.85	5.55
35	3	AGNL ANTENNA LP	1801 E ST ANDREW PL	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	10,994.00	5,497.00	50%	5,497.00	12.61	7.82	16.82	50.46
36	3	WEST FLAGER, LLC DBA CITY PLACE	2771 N MAIN ST 3/4	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	8,008.00	4,004.00	50%	4,004.00	9.19	5.70	12.25	36.75
37	3	ALPINEFRESH USA, INC.	2020 S HATHAWAY ST	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	7,525.00	3,762.50	50%	3,762.50	8.63	5.36	11.51	34.54
38	3	SAVY S SUOS	216 E WARNER AVE	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	6,130.00	3,065.00	50%	3,065.00	7.03	4.36	9.38	28.13
39	3	PALMDALE AVENUE S LLC	1730 E 17TH ST	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	5,906.00	2,953.00	50%	2,953.00	6.78	4.20	9.04	27.11
40	3	1701 E EDINGER LLC	1701 E EDINGER AVE	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	5,587.00	2,793.50	50%	2,793.50	6.41	3.98	8.55	25.64
41	3	FABCON CORP	1800 E ST ANDREW PL	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	4,956.00	2,478.00	50%	2,478.00	5.69	3.53	7.58	22.75
42	3	CENTURION PARTNERS LLC	1928 S GRAND AVE	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	4,091.00	2,045.50	50%	2,045.50	4.69	2.91	6.26	18.78
43	3	MAINPLACE SHOPPINGTOWN, LLC	2800 N MAIN ST	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	21,700.00	10,850.00	10%	2,170.00	4.98	3.09	6.64	19.92
44	3	BOYD SANTA ANA, LLC	1750 E 4TH ST	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	3,861.00	1,930.50	50%	1,930.50	4.43	2.75	5.91	17.72
45	3	LYON ST TRUST U T D	1640 E 1ST ST	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	3,948.00	1,974.00	50%	1,974.00	4.53	2.81	6.04	18.12
46	3	BULLOCKS SANTA ANA	2800 N MAIN ST	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	3,652.00	1,826.00	50%	1,826.00	4.19	2.60	5.59	16.76
47	3	COUNTY OF ORANGE	1400 S GRAND AVE	SANTA ANA	CA	92707	GOVERNMENT	90%	8,018.00	7,216.20	40%	3,207.20	7.36	4.56	9.81	29.44
48	3	COUNTY OF ORANGE	1300 S GRAND AVE	SANTA ANA	CA	92707	GOVERNMENT	90%	3,647.00	3,282.30	40%	1,458.80	3.35	2.08	4.46	13.39
49	3	COUNTY OF ORANGE	1501 E ST ANDREW PL	SANTA ANA	CA	92707	GOVERNMENT	90%	1,708.00	1,537.20	40%	683.20	1.57	0.97	2.09	6.27
50	3	OCFA #79	1320 E WARNER AVE	SANTA ANA	CA	92707	GOVERNMENT	90%	538.00	484.20	40%	215.20	0.49	0.31	0.66	1.98
51	3	MILITARY DEPT	612 E WARNER AVE	SANTA ANA	CA	92707	GOVERNMENT	90%	186.00	167.40	40%	74.40	0.17	0.11	0.23	0.68
52	3	EMBEE PROCESSING, INC	2148 S HATHAWAY ST	SANTA ANA	CA	92707	INDUS/DUMPT	50%	8,633.00	4,316.50	50%	4,316.50	9.90	6.14	13.21	39.62
53	3	L & N COSTUM SERVICES	1602 E EDINGER AVE	SANTA ANA	CA	92707	INDUS/DUMPT	50%	11,666.00	5,833.00	50%	5,833.00	13.38	8.30	17.85	53.54
54	3	EMBEE PROCESSING, INC.	2144 S HATHAWAY ST	SANTA ANA	CA	92707	INDUS/DUMPT	50%	5,950.00	2,975.00	50%	2,975.00	6.83	4.23	9.10	27.31
55	3	ACTIVE PLATING INC	1411 E POMONA ST	SANTA ANA	CA	92707	INDUS/DUMPT	50%	6,253.00	3,126.50	50%	3,126.50	7.17	4.45	9.57	28.70
56	3	HOLIDAY ROCK COMPANY, INC	2130 S GRAND AVE	SANTA ANA	CA	92707	INDUS/DUMPT	50%	4,531.00	2,265.50	50%	2,265.50	5.20	3.22	6.93	20.80
57	3	ADVANCE MEDICAL OPTICS	1700 E ST ANDREW PL	SANTA ANA	CA	92707	INDUS/DUMPT	50%	4,652.00	2,326.00	50%	2,326.00	5.34	3.31	7.12	21.35
58	3	RED ROOF INNS INC	2600 N MAIN ST	SANTA ANA	CA	92707	IRRIGATION	100%	5,623.00	5,623.00	100%	5,623.00	12.90	8.00	17.21	51.62
59	3	PARKCENTER MGM	1273 N CABRILLO PARK DR	SANTA ANA	CA	92707	IRRIGATION	100%	3,168.00	3,168.00	100%	3,168.00	7.27	4.51	9.69	29.08
60	3	PACIFIC CENTER OWNER, LLC	1610 E ST ANDREW PL	SANTA ANA	CA	92707	IRRIGATION	100%	2,972.00	2,972.00	100%	2,972.00	6.82	4.23	9.09	27.28

CITY OF SANTA ANA RECYCLED WATER MASTER PLAN

Potential Recycled Water Retrofit Sites by Phase

Site No.	Phase	Customer Name	Customer Address	City	State	Zip Code	Tax District	Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Domestic Water Annual Demand (BU/YR)	Potential Recycled Water Use (BU/YR)	Final Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Final Potential Recycled Water Demand (BU/YR)	Final Potential Recycled Water Demand (AFT/YR)	Average Daily Demand (ADD) GPM	Max Day Demand (MDD) GPM	Peak Hour Demand (PHD) GPM
61	3	PALMDALE AVENUE S LLC	1740 E 17TH ST	SANTA ANA	CA	92707	IRRIGATION	100%	2,623.00	2,623.00	100%	2,623.00	6.02	3.73	8.03	24.08
62	3	PACIFICENTER OWNERS' ASSOCIATION	1601 E ST ANDREW PL 1/2	SANTA ANA	CA	92707	IRRIGATION	100%	2,612.00	2,612.00	100%	2,612.00	5.99	3.72	7.99	23.98
63	3	PMS/BRADT PL/HM ASC	3000 S SYCAMORE ST	SANTA ANA	CA	92707	IRRIGATION	100%	2,542.00	2,542.00	100%	2,542.00	5.83	3.62	7.78	23.33
64	3	PMS/BRADF PL/HM ASC	2931 S SYCAMORE ST	SANTA ANA	CA	92707	IRRIGATION	100%	2,327.00	2,327.00	100%	2,327.00	5.34	3.31	7.12	21.36
65	3	HERITAGE PAPER	2400 S GRAND AVE	SANTA ANA	CA	92707	IRRIGATION	100%	2,051.00	2,051.00	100%	2,051.00	4.71	2.92	6.28	18.83
66	3	PACIFICENTER OWNERS ASSOCIATION	1702 E EDINGER AVE	SANTA ANA	CA	92707	IRRIGATION	100%	1,712.00	1,712.00	100%	1,712.00	3.93	2.44	5.24	15.72
67	3	PACIFICENTER OWNERS' ASSOCIATION	1504 E ST ANDREW PL	SANTA ANA	CA	92707	IRRIGATION	100%	1,654.00	1,654.00	100%	1,654.00	3.80	2.35	5.06	15.18
68	3	PRES CORPORATE CENTER LLC	1671 E ST ANDREW PL 1/2	SANTA ANA	CA	92707	IRRIGATION	100%	1,620.00	1,620.00	100%	1,620.00	3.72	2.31	4.96	14.87
69	3	WEST FLAGER, LLC DBA CITY PLACE	2791 N MAIN ST 3/4	SANTA ANA	CA	92707	IRRIGATION	100%	1,623.00	1,623.00	100%	1,623.00	3.72	2.31	4.97	14.90
70	3	PARKCENTER MGM	2039 E FRUIT ST	SANTA ANA	CA	92707	IRRIGATION	100%	1,440.00	1,440.00	100%	1,440.00	3.30	2.05	4.41	13.22
71	3	BRADFORD WEST HOA 50	2910 S BRADFORD PL	SANTA ANA	CA	92707	IRRIGATION	100%	1,364.00	1,364.00	100%	1,364.00	3.13	1.94	4.17	12.52
72	3	MAINPLACE SHOPPINGTOWN, LLC	2800 N MAIN ST	SANTA ANA	CA	92707	IRRIGATION	100%	1,378.00	1,378.00	100%	1,378.00	3.16	1.96	4.22	12.65
73	3	BRADFORD PL SA 2	460 W CARRIAGE DR	SANTA ANA	CA	92707	IRRIGATION	100%	1,245.00	1,245.00	100%	1,245.00	2.86	1.77	3.81	11.43
74	3	PACIFIC CENTER OWNER, LLC	1550 E ST ANDREW PL	SANTA ANA	CA	92707	IRRIGATION	100%	1,247.00	1,247.00	100%	1,247.00	2.86	1.78	3.82	11.45
75	3	WARNER GRAND PLAZA	2214 S GRAND AVE	SANTA ANA	CA	92707	IRRIGATION	100%	1,110.00	1,110.00	100%	1,110.00	2.55	1.58	3.40	10.19
76	3	BRADFORD PLACE WEST	3010 S BRADFORD PL	SANTA ANA	CA	92707	IRRIGATION	100%	1,052.00	1,052.00	100%	1,052.00	2.41	1.50	3.22	9.66
77	3	BRADFORD PLACE SA 2	3001 S BRADFORD PL	SANTA ANA	CA	92707	IRRIGATION	100%	1,028.00	1,028.00	100%	1,028.00	2.36	1.46	3.15	9.44
78	3	BRADFORD PL SA #2	2941 S BRADFORD PL	SANTA ANA	CA	92707	IRRIGATION	100%	953.00	953.00	100%	953.00	2.19	1.36	2.92	8.75
79	3	DISCOVERY SCIENCE CENTER	2500 N MAIN ST	SANTA ANA	CA	92707	IRRIGATION	100%	1,010.00	1,010.00	100%	1,010.00	2.32	1.44	3.09	9.27
80	3	MABURY SQ OWNERS ASSOC	1642 E FRUIT ST	SANTA ANA	CA	92707	IRRIGATION	100%	943.00	943.00	100%	943.00	2.16	1.34	2.89	8.66
81	3	BRADFORD PL II 505	2971 S BRADFORD PL	SANTA ANA	CA	92707	IRRIGATION	100%	910.00	910.00	100%	910.00	2.09	1.30	2.78	8.35
82	3	17TH ST PARK COMMUNITY ASS	1601 E 17TH ST	SANTA ANA	CA	92707	IRRIGATION	100%	934.00	934.00	100%	934.00	2.14	1.33	2.86	8.57
83	3	LOS OLIVOS BUS PARK	301 W DYER RD	SANTA ANA	CA	92707	IRRIGATION	100%	873.00	873.00	100%	873.00	2.00	1.24	2.67	8.01
84	3	LOS OLIVOS BUS PARK	201 W DYER RD	SANTA ANA	CA	92707	IRRIGATION	100%	728.00	728.00	100%	728.00	1.67	1.04	2.23	6.68
85	3	PACIFICENTER OWNERS' ASSOCIATION	1658 E ST ANDREW PL	SANTA ANA	CA	92707	IRRIGATION	100%	814.00	814.00	100%	814.00	1.87	1.16	2.49	7.47
86	3	ADAPT AUTOMATION INC	1661 E PALM ST	SANTA ANA	CA	92707	IRRIGATION	100%	722.00	722.00	100%	722.00	1.66	1.03	2.21	6.63
87	3	TRUST A DUNTLEY	132 E DYER RD	SANTA ANA	CA	92707	IRRIGATION	100%	687.00	687.00	100%	687.00	1.58	0.98	2.10	6.31
88	3	LOS OLIVOS BUS PARK	2720 S MAIN ST	SANTA ANA	CA	92707	IRRIGATION	100%	644.00	644.00	100%	644.00	1.48	0.92	1.97	5.91
89	3	PARKCENTER MGM	1937 E FRUIT ST	SANTA ANA	CA	92707	IRRIGATION	100%	620.00	620.00	100%	620.00	1.42	0.88	1.90	5.69
90	3	17TH ST PARK COMMUNITY ASS	1601 E 18TH ST	SANTA ANA	CA	92707	IRRIGATION	100%	619.00	619.00	100%	619.00	1.42	0.88	1.89	5.68
91	3	MC DONALD CORPORATION	2300 S MAIN ST	SANTA ANA	CA	92707	IRRIGATION	100%	581.00	581.00	100%	581.00	1.33	0.83	1.78	5.33
92	3	O.C. APARTMENTS, LLC	1600 N MABURY ST	SANTA ANA	CA	92707	IRRIGATION	100%	445.00	445.00	100%	445.00	1.02	0.63	1.36	4.09
93	3	5 FRWY @ 1ST ST FREEWAY IRRI	1729 E 1ST ST	SANTA ANA	CA	92707	IRRIGATION	100%	436.00	436.00	100%	436.00	1.00	0.62	1.33	4.00
94	3	PARKCENTER MGM	2007 E FRUIT ST	SANTA ANA	CA	92707	IRRIGATION	100%	415.00	415.00	100%	415.00	0.95	0.59	1.27	3.81
95	3	BOYD SANTA ANA, LLC	1750 E 4TH ST	SANTA ANA	CA	92707	IRRIGATION	100%	407.00	407.00	100%	407.00	0.93	0.58	1.25	3.74
96	3	OHANA INVESTOR 3 LLC	1600 N MABURY ST	SANTA ANA	CA	92707	IRRIGATION	100%	396.00	396.00	100%	396.00	0.91	0.56	1.21	3.64
97	3	LOS OLIVOS BUSINESS PARK	2700 S MAIN ST	SANTA ANA	CA	92707	IRRIGATION	100%	359.00	359.00	100%	359.00	0.82	0.51	1.10	3.30
98	3	EXEC GUILD	1800 E 16TH ST	SANTA ANA	CA	92707	IRRIGATION	100%	297.00	297.00	100%	297.00	0.68	0.42	0.91	2.73
99	3	LOS OLIVOS BUS PARK	2800 S MAIN ST	SANTA ANA	CA	92707	IRRIGATION	100%	288.00	288.00	100%	288.00	0.66	0.41	0.88	2.64
100	3	CATHOLIC CHARITIES OF ORANGE COUNTY	1800 E 17TH ST	SANTA ANA	CA	92707	IRRIGATION	100%	283.00	283.00	100%	283.00	0.65	0.40	0.87	2.60
101	3	IRON MOUNTAIN-SOCAL TERRITORY	1915 S GRAND AVE	SANTA ANA	CA	92707	IRRIGATION	100%	260.00	260.00	100%	260.00	0.60	0.37	0.80	2.39
102	3	PARKHOUSE TIRE	711 S GRAND AVE	SANTA ANA	CA	92707	IRRIGATION	100%	233.00	233.00	100%	233.00	0.53	0.33	0.71	2.14
103	3	NATHAN LEANSE	1590 E ST GERTRUDE PL	SANTA ANA	CA	92707	IRRIGATION	100%	233.00	233.00	100%	233.00	0.53	0.33	0.71	2.14
104	3	RITCHEY ASSOCIATED LLC	1922 E ST ANDREW PL	SANTA ANA	CA	92707	IRRIGATION	100%	185.00	185.00	100%	185.00	0.42	0.26	0.57	1.70
105	3	BRADFORD PL SA #2	2981 S BRADFORD PL	SANTA ANA	CA	92707	IRRIGATION	100%	140.00	140.00	100%	140.00	0.32	0.20	0.43	1.29
106	3	SADDLEBACK INN L L C	1659 E 1ST ST	SANTA ANA	CA	92707	IRRIGATION	100%	111.00	111.00	100%	111.00	0.25	0.16	0.34	1.02
107	3	CANS FOR COINS	2629 S CYPRESS AVE	SANTA ANA	CA	92707	IRRIGATION	100%	83.00	83.00	100%	83.00	0.19	0.12	0.25	0.76
108	3	EXCALIBER FUELS & MART	1501 E EDINGER AVE	SANTA ANA	CA	92707	IRRIGATION	100%	94.00	94.00	100%	94.00	0.22	0.13	0.29	0.86
109	3	ASHTON PROPERTIES LTD	124 E CENTRAL AVE	SANTA ANA	CA	92707	IRRIGATION	100%	45.00	45.00	100%	45.00	0.10	0.06	0.14	0.41

CITY OF SANTA ANA RECYCLED WATER MASTER PLAN

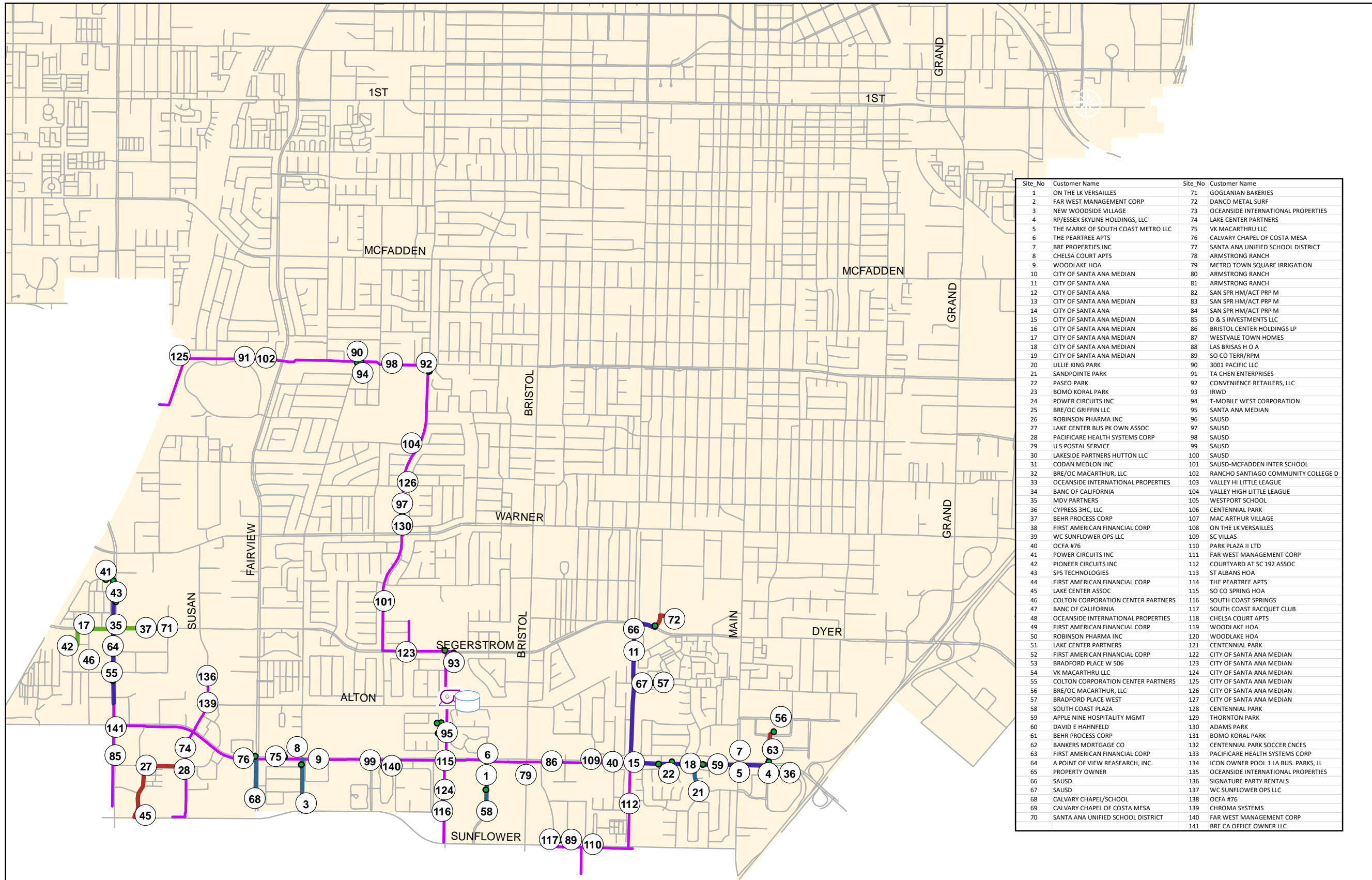
Potential Recycled Water Retrofit Sites by Phase

Site No.	Phase	Customer Name	Customer Address	City	State	Zip Code	Tax District	Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Domestic Water Annual Demand (BU/YR)	Potential Recycled Water Use (BU/YR)	Final Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Final Potential Recycled Water Demand (BU/YR)	Final Potential Recycled Water Demand (AFT/YR)	Average Daily Demand (ADD) GPM	Max Day Demand (MDD) GPM	Peak Hour Demand (PHD) GPM
110	3	BT INVESTMENT	2416 S MAIN ST	SANTA ANA	CA	92707	IRRIGATION	100%	11.00	11.00	100%	11.00	0.03	0.02	0.03	0.10
111	3	FDTN HEALTH KAISER	1900 E 4TH ST	SANTA ANA	CA	92707	IRRIGATION	100%	9.00	9.00	100%	9.00	0.02	0.01	0.03	0.08
112	3	1750 ACQUISITIONS PARTNERS, LLC	1750 E 4TH ST	SANTA ANA	CA	92707	IRRIGATION	100%	1,403.00	1,403.00	100%	1,403.00	3.22	0.00	0.00	0.01
113	3	CAL-TRANS MEDIAN IRRIGATION	2519 N MAIN ST	SANTA ANA	CA	92707	IRRIGATION	100%	70.00	70.00	100%	70.00	0.16	0.00	0.00	0.01
114	3	RICHARD A AYLING	1840 E 16TH ST	SANTA ANA	CA	92707	IRRIGATION	100%	43.00	43.00	100%	43.00	0.10	0.00	0.00	0.01
115	3	WESTERN MEDICAL CENTER	1001 N TUSTIN AVE	SANTA ANA	CA	92707	MEDICAL	50%	34,119.00	17,059.50	5%	1,705.95	3.91	2.43	5.22	15.66
116	3	BROOKHOLLOW OFFICE PARK	1528 E WARNER AVE	SANTA ANA	CA	92707	MST RETAIL	50%	15,450.00	7,725.00	20%	3,090.00	7.09	4.40	9.46	28.36
117	3	MAINPLACE SHOPPINGTOWN, LLC	2800 N MAIN ST	SANTA ANA	CA	92707	MST RETAIL	50%	11,219.00	5,609.50	20%	2,243.80	5.15	3.19	6.87	20.60
118	3	SAUSD	1401 S GRAND AVE	SANTA ANA	CA	92707	SCHOOL	75%	15,172.00	11,379.00	25%	3,793.00	8.70	5.40	11.61	34.82
119	3	SAUSD	2240 S MAIN ST	SANTA ANA	CA	92707	SCHOOL	75%	6,083.00	4,562.30	25%	1,520.75	3.49	2.16	4.65	13.96
120	3	SAUSD-VILLA INTERMEDIATE SCHOOL	1441 E CHESTNUT AVE	SANTA ANA	CA	92707	SCHOOL	75%	7,222.00	5,416.50	20%	1,444.40	3.31	2.06	4.42	13.26
121	3	SAUSD	417 E CENTRAL AVE	SANTA ANA	CA	92707	SCHOOL	75%	4,727.00	3,545.30	25%	1,181.75	2.71	1.68	3.62	10.85
122	3	SAUSD	1601 E CHESTNUT AVE	SANTA ANA	CA	92707	SCHOOL	75%	2,929.00	2,196.80	25%	732.25	1.68	1.04	2.24	6.72
123	3	NATHAN LEANSE	1505 E WARNER AVE	SANTA ANA	CA	92707	WHOLESALE FOOD	50%	25,326.00	12,663.00	50%	12,663.00	29.05	18.02	38.75	116.24
													528.78			
1	4	VILLA VERDE APARTMENTS	4200 W 1ST ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	21,339.00	8,535.60	25%	5,334.75	12.24	7.59	16.32	48.97
2	4	BENTLEY PARKE APARTMENTS	3200 W 5TH ST	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	28,029.00	11,211.60	20%	5,605.80	12.86	7.98	17.15	51.46
3	4	STRATFORD MILE SQUARE RENTALS LLC	4800 W MCFADDEN AVE	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	19,231.00	7,692.40	25%	4,807.75	11.03	6.84	14.71	44.13
4	4	HARBOR POINTE APARTMENTS	1500 N HARBOR BLVD	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	15,092.00	6,036.80	25%	3,773.00	8.66	5.37	11.54	34.63
5	4	SUNSET RIDGE INVESTMENT LP	1314 N HARBOR BLVD	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	9,255.00	3,702.00	25%	2,313.75	5.31	3.29	7.08	21.24
6	4	CORSICAN FAMILY VILLAGE H O A	3927 W MCFADDEN AVE	SANTA ANA	CA	92707	APARTMENTS W/DUMPSTER	40%	9,134.00	3,653.60	25%	2,283.50	5.24	3.25	6.99	20.96
7	4	CITY OF SANTA ANA	630 S SUSAN ST 3/4	SANTA ANA	CA	92707	CITY IRRIGATION	100%	454.00	454.00	100%	454.00	1.04	0.65	1.39	4.17
8	4	CITY OF SANTA ANA MEDIAN	3610 W MCFADDEN AVE	SANTA ANA	CA	92707	CITY IRRIGATION	100%	11.00	11.00	100%	11.00	0.03	0.02	0.03	0.10
9	4	CITY OF SANTA ANA ENTRY PRTL	3710 W WASHINGTON AVE	SANTA ANA	CA	92707	CITY IRRIGATION	100%	4.00	4.00	100%	4.00	0.01	0.01	0.01	0.04
10	4	CITY OF SANTA ANA MEDIAN	3900 W 1ST ST 1/2	SANTA ANA	CA	92707	CITY IRRIGATION	100%	52.00	52.00	100%	52.00	0.12	0.00	0.00	0.01
11	4	CITY OF SANTA ANA MEDIAN	600 S HARBOR BLVD	SANTA ANA	CA	92707	CITY IRRIGATION	100%	927.00	927.00	100%	927.00	2.13	0.00	0.00	0.01
12	4	CITY OF SANTA ANA MEDIAN	923 N HARBOR BLVD	SANTA ANA	CA	92707	CITY IRRIGATION	100%	2,029.00	2,029.00	100%	2,029.00	4.66	0.00	0.00	0.01
13	4	CITY OF SANTA ANA NEWHOPE LIB	122 N NEWHOPE ST	SANTA ANA	CA	92707	CITY OWNED PROPERTY	90%	156.00	140.40	40%	62.40	0.14	0.09	0.19	0.57
14	4	CAMPENSINO PARK	3311 W 5TH ST	SANTA ANA	CA	92707	CITY PARK	90%	6,713.00	6,041.70	90%	6,041.70	13.86	8.60	18.49	55.46
15	4	HERITAGE PARK	4817 W CAMILLE ST	SANTA ANA	CA	92707	CITY PARK	90%	4,947.00	4,452.30	90%	4,452.30	10.22	6.34	13.62	40.87
16	4	ROSITA PARK	4600 W HAZARD AVE	SANTA ANA	CA	92707	CITY PARK	90%	4,542.00	4,087.80	90%	4,087.80	9.38	5.82	12.51	37.52
17	4	1ST STREET CARWASH, LP	4426 W 1ST ST	SANTA ANA	CA	92707	COMMERCIAL PROPERTY	50%	8,178.00	4,089.00	90%	7,360.20	16.89	10.48	22.52	67.56
18	4	FIRST NEWPORT PLAZA LLC	4401 W 1ST ST	SANTA ANA	CA	92707	COMMERCIAL W/DUMPSTER	50%	5,619.00	2,809.50	50%	2,809.50	6.45	4.00	8.60	25.79
19	4	CONDOS NEWHOPE	200 N NEWHOPE ST	SANTA ANA	CA	92707	IRRIGATION	100%	2,134.00	2,134.00	100%	2,134.00	4.90	3.04	6.53	19.59
20	4	HARBOR HAZARD HOA	3820 W HAZARD AVE	SANTA ANA	CA	92707	IRRIGATION	100%	2,037.00	2,037.00	100%	2,037.00	4.67	2.90	6.23	18.70
21	4	VIETNAMESE CATHOLIC CENTER	1538 N CENTURY BLVD	SANTA ANA	CA	92707	IRRIGATION	100%	1,915.00	1,915.00	100%	1,915.00	4.39	2.73	5.86	17.58
22	4	MGP XI SANTA ANA CENTRE, LLC	100 N HARBOR BLVD	SANTA ANA	CA	92707	IRRIGATION	100%	1,844.00	1,844.00	100%	1,844.00	4.23	2.62	5.64	16.93
23	4	RIVERVIEW WEST MRKTPLACE IRRIGATION	741 S HARBOR BLVD	SANTA ANA	CA	92707	IRRIGATION	100%	1,461.00	1,461.00	100%	1,461.00	3.35	2.08	4.47	13.41
24	4	WAL-MART	3600 W MCFADDEN AVE	SANTA ANA	CA	92707	IRRIGATION	100%	1,316.00	1,316.00	100%	1,316.00	3.02	1.87	4.03	12.08
25	4	SEABREEZE	1206 N HARBOR BLVD 3/4	SANTA ANA	CA	92707	IRRIGATION	100%	1,226.00	1,226.00	100%	1,226.00	2.81	1.75	3.75	11.25
26	4	POOR CLARE MISSIONAR	1019 N NEWHOPE ST	SANTA ANA	CA	92707	IRRIGATION	100%	1,200.00	1,200.00	100%	1,200.00	2.75	1.71	3.67	11.02
27	4	GROVE TOWN HOMES OAK	909 N WILLARDSON WAY	SANTA ANA	CA	92707	IRRIGATION	100%	1,042.00	1,042.00	100%	1,042.00	2.39	1.48	3.19	9.57
28	4	HARBOR PLACE SHOPPING CENTER LLC	622 S HARBOR BLVD	SANTA ANA	CA	92707	IRRIGATION	100%	758.00	758.00	100%	758.00	1.74	1.08	2.32	6.96
29	4	BBSC DEVELOPMENT LLC	3710 W WESTMINSTER AVE	SANTA ANA	CA	92707	IRRIGATION	100%	282.00	282.00	100%	282.00	0.65	0.40	0.86	2.59
30	4	LAS BOLSAS	4323 W 1ST ST 1/2	SANTA ANA	CA	92707	IRRIGATION	100%	227.00	227.00	100%	227.00	0.52	0.32	0.70	2.08
31	4	LAS BOLSAS HOA	4329 W 1ST ST	SANTA ANA	CA	92707	IRRIGATION	100%	145.00	145.00	100%	145.00	0.33	0.21	0.44	1.33
32	4	DAVID MAI	626 S NEWHOPE ST	SANTA ANA	CA	92707	IRRIGATION	100%	29.00	29.00	100%	29.00	0.07	0.04	0.09	0.27

CITY OF SANTA ANA RECYCLED WATER MASTER PLAN

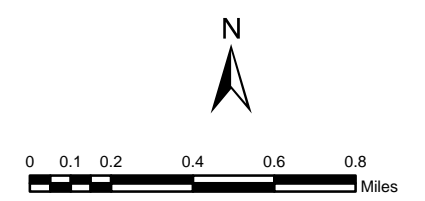
Potential Recycled Water Retrofit Sites by Phase

Site No.	Phase	Customer Name	Customer Address	City	State	Zip Code	Tax District	Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Domestic Water Annual Demand (BU/YR)	Potential Recycled Water Use (BU/YR)	Final Estimated Percentage of Domestic Water Demand Convertible to Recycled Water	Final Potential Recycled Water Demand (BU/YR)	Final Potential Recycled Water Demand (AFT/YR)	Average Daily Demand (ADD) GPM	Max Day Demand (MDD) GPM	Peak Hour Demand (PHD) GPM
33	4	TRANG LIN	3509 W 5TH ST 3/4	SANTA ANA	CA	92707	IRRIGATION	100%	35.00	35.00	100%	35.00	0.08	0.05	0.11	0.32
34	4	ELM PARK TONWHOMES OWNERS ASSOC	3855 W HAZARD AVE	SANTA ANA	CA	92707	IRRIGATION	100%	133.00	133.00	100%	133.00	0.31	0.00	0.00	0.01
35	4	MARY CHANG	808 N HARBOR BLVD	SANTA ANA	CA	92707	IRRIGATION	100%	255.00	255.00	100%	255.00	0.59	0.00	0.00	0.01
36	4	SOUTH COAST CAR COMPANY, INC.	808 N HARBOR BLVD	SANTA ANA	CA	92707	IRRIGATION	100%	1.00	1.00	100%	1.00	0.00	0.00	0.00	0.01
37	4	PARK TERRACE MOBILE HOME PARK	4080 W 1ST ST	SANTA ANA	CA	92707	MOBILE HOME	40%	25,298.00	10,119.20	10%	2,529.80	5.80	3.60	7.74	23.22
38	4	LAKE PARK SANTA ANA	4211 W 1ST ST	SANTA ANA	CA	92707	MOBILE HOME	40%	19,356.00	7,742.40	10%	1,935.60	4.44	2.76	5.92	17.77
39	4	GGUSD	4600 W MCFADDEN AVE	SANTA ANA	CA	92707	SCHOOL	75%	15,797.00	11,847.80	25%	3,949.25	9.06	5.62	12.08	36.25
40	4	GGUSD/ROSITA ELEMENTARY SCHL	4726 W HAZARD AVE	SANTA ANA	CA	92707	SCHOOL	75%	7,575.00	5,681.30	25%	1,893.75	4.35	2.70	5.79	17.38
41	4	GGUSD/HAZARD ELEMENTARY SCHL	4218 W HAZARD AVE	SANTA ANA	CA	92707	SCHOOL	75%	7,003.00	5,252.30	25%	1,750.75	4.02	2.49	5.36	16.07
42	4	GGUSD	600 S JACKSON ST	SANTA ANA	CA	92707	SCHOOL	75%	6,712.00	5,034.00	25%	1,678.00	3.85	2.39	5.13	15.40
43	4	GGUSD	4815 W CAMILLE ST	SANTA ANA	CA	92707	SCHOOL	75%	3,100.00	2,325.00	25%	775.00	1.78	1.10	2.37	7.11
44	4	ADOHR FARMS INC	4002 W WESTMINSTER AVE	SANTA ANA	CA	92707	WHOLESALE FOOD	50%	102,074.00	51,037.00	50%	51,037.00	117.10	72.63	156.16	468.48
45	4	RIVER VIEW GOLF COURSE		SANTA ANA	CA	92707	IRRIGATION	100%	79,714.85	79,714.85	100%	79,714.85	182.90	113.45	243.91	731.72
46	4	WILLOWICK GOLF COURSE		SANTA ANA	CA	92707	IRRIGATION	100%	87,120.05	87,120.05	100%	87,120.05	199.90	123.98	266.57	799.69



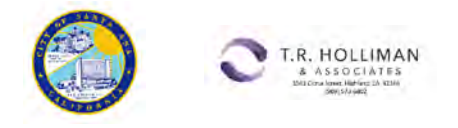
Site_No	Customer Name	Site_No	Customer Name
1	ON THE LK VERSAILLES	71	GUGLIANIAN BAKERIES
2	FAR WEST MANAGEMENT CORP	72	DANCO METAL SURF
3	NEW WOODSIDE VILLAGE	73	OCEANSIDE INTERNATIONAL PROPERTIES
4	RP/ESSEX SKYLINE HOLDINGS, LLC	74	LAKE CENTER PARTNERS
5	THE MARKE OF SOUTH COAST METRO LLC	75	VK MACARTHUR LLC
6	THE PEARTREE APTS	76	CALVARY CHAPEL OF COSTA MESA
7	BRE PROPERTIES INC	77	SANTA ANA UNIFIED SCHOOL DISTRICT
8	CHELSEA COURT APTS	78	ARMSTRONG RANCH
9	WOODLAKE HOA	79	METRO TOWN SQUARE IRRIGATION
10	CITY OF SANTA ANA MEDIAN	80	ARMSTRONG RANCH
11	CITY OF SANTA ANA	81	ARMSTRONG RANCH
12	CITY OF SANTA ANA	82	SAN SPR HM/ACT PRP M
13	CITY OF SANTA ANA MEDIAN	83	SAN SPR HM/ACT PRP M
14	CITY OF SANTA ANA	84	SAN SPR HM/ACT PRP M
15	CITY OF SANTA ANA MEDIAN	85	D & S INVESTMENTS LLC
16	CITY OF SANTA ANA MEDIAN	86	BRISTOL CENTER HOLDINGS LP
17	CITY OF SANTA ANA MEDIAN	87	WESTVALE TOWN HOMES
18	CITY OF SANTA ANA MEDIAN	88	LAS BRISAS H O A
19	CITY OF SANTA ANA MEDIAN	89	SO CO TERR/RPM
20	LILLIE KING PARK	90	3001 PACIFIC LLC
21	SANDPOINTE PARK	91	TA CHEN ENTERPRISES
22	PASEO PARK	92	CONVENIENCE RETAILERS, LLC
23	BOMO KORAL PARK	93	IRWD
24	POWER CIRCUITS INC	94	T-MOBILE WEST CORPORATION
25	BRE/OC GRIFFIN LLC	95	SANTA ANA MEDIAN
26	ROBINSON PHARMA INC	96	SAUSD
27	LAKE CENTER BUS PK OWN ASSOC	97	SAUSD
28	PACIFICARE HEALTH SYSTEMS CORP	98	SAUSD
29	U S POSTAL SERVICE	99	SAUSD
30	LAKESIDE PARTNERS HUTTON LLC	100	SAUSD
31	CODAN MEDLON INC	101	SAUSD-MCFADDEN INTER SCHOOL
32	BRE/OC MACARTHUR, LLC	102	RANCHO SANTIAGO COMMUNITY COLLEGE D
33	OCEANSIDE INTERNATIONAL PROPERTIES	103	VALLEY HI LITTLE LEAGUE
34	BANC OF CALIFORNIA	104	VALLEY HIGH LITTLE LEAGUE
35	MDV PARTNERS	105	WESTPORT SCHOOL
36	CYPRESS 3HC, LLC	106	CENTENNIAL PARK
37	BEHR PROCESS CORP	107	MAC ARTHUR VILLAGE
38	FIRST AMERICAN FINANCIAL CORP	108	ON THE LK VERSAILLES
39	WC SUNFLOWER OPS LLC	109	SC VILLAS
40	OCFA #76	110	PARK PLAZA II LTD
41	POWER CIRCUITS INC	111	FAR WEST MANAGEMENT CORP
42	PIONEER CIRCUITS INC	112	COURTYARD AT SC 192 ASSOC
43	SPS TECHNOLOGIES	113	ST ALBANS HOA
44	FIRST AMERICAN FINANCIAL CORP	114	THE PEARTREE APTS
45	LAKE CENTER ASSOC	115	SO CO SPRING HOA
46	COLTON CORPORATION CENTER PARTNERS	116	SOUTH COAST SPRINGS
47	BANC OF CALIFORNIA	117	SOUTH COAST RACQUET CLUB
48	OCEANSIDE INTERNATIONAL PROPERTIES	118	CHELSEA COURT APTS
49	FIRST AMERICAN FINANCIAL CORP	119	WOODLAKE HOA
50	ROBINSON PHARMA INC	120	WOODLAKE HOA
51	LAKE CENTER PARTNERS	121	CENTENNIAL PARK
52	FIRST AMERICAN FINANCIAL CORP	122	CITY OF SANTA ANA MEDIAN
53	BRADFORD PLACE W 506	123	CITY OF SANTA ANA MEDIAN
54	VK MACARTHUR LLC	124	CITY OF SANTA ANA MEDIAN
55	COLTON CORPORATION CENTER PARTNERS	125	CITY OF SANTA ANA MEDIAN
56	BRE/OC MACARTHUR, LLC	126	CITY OF SANTA ANA MEDIAN
57	BRADFORD PLACE WEST	127	CITY OF SANTA ANA MEDIAN
58	SOUTH COAST PLAZA	128	CENTENNIAL PARK
59	APPLE NINE HOSPITALITY MGMT	129	THORNTON PARK
60	DAVID E HAHNFELD	130	ADAMS PARK
61	BEHR PROCESS CORP	131	BOMO KORAL PARK
62	BANKERS MORTGAGE CO	132	CENTENNIAL PARK SOCCER CNCS
63	FIRST AMERICAN FINANCIAL CORP	133	PACIFICARE HEALTH SYSTEMS CORP
64	A POINT OF VIEW RESEARCH, INC.	134	ICON OWNER POOL 1 LA BUS. PARKS, LL
65	PROPERTY OWNER	135	OCEANSIDE INTERNATIONAL PROPERTIES
66	SAUSD	136	SIGNATURE PARTY RENTALS
67	SAUSD	137	WC SUNFLOWER OPS LLC
68	CALVARY CHAPEL/SCHOOL	138	OCFA #76
69	CALVARY CHAPEL OF COSTA MESA	139	CHROMA SYSTEMS
70	SANTA ANA UNIFIED SCHOOL DISTRICT	140	FAR WEST MANAGEMENT CORP
		141	BRE CA OFFICE OWNER LLC

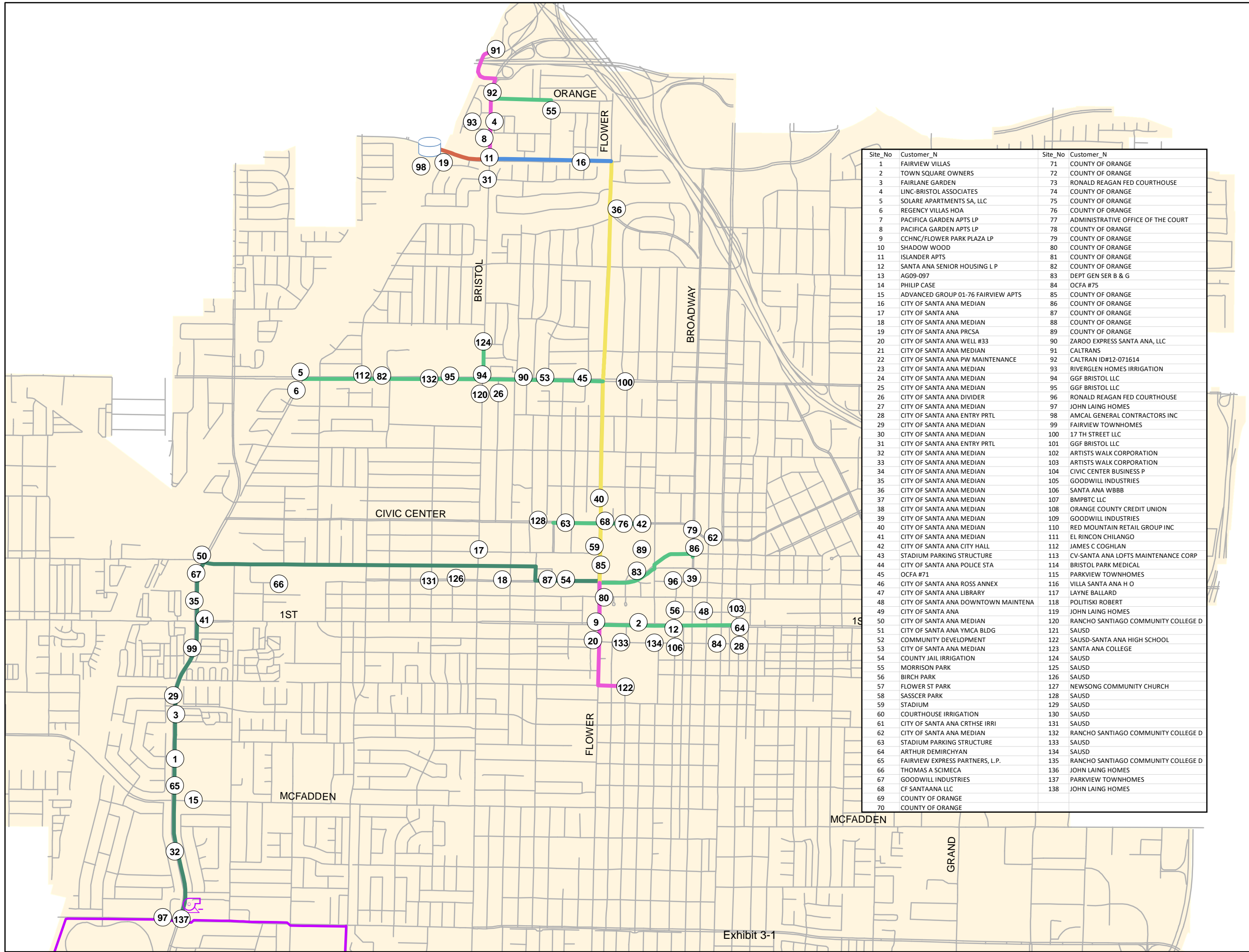
- ### Legend
- Existing Tank
 - Existing Pump
- ### Diameter
- 4
 - 6
 - 8
 - 12
 - Existing_Reclaimed
 - Streets
 - City_Boundary



Total Potential Demand (AFY)
= 1,137

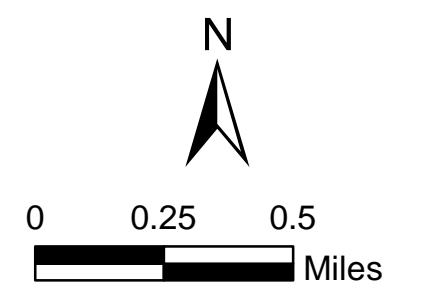
Phase I Customers and Alignment





Legend

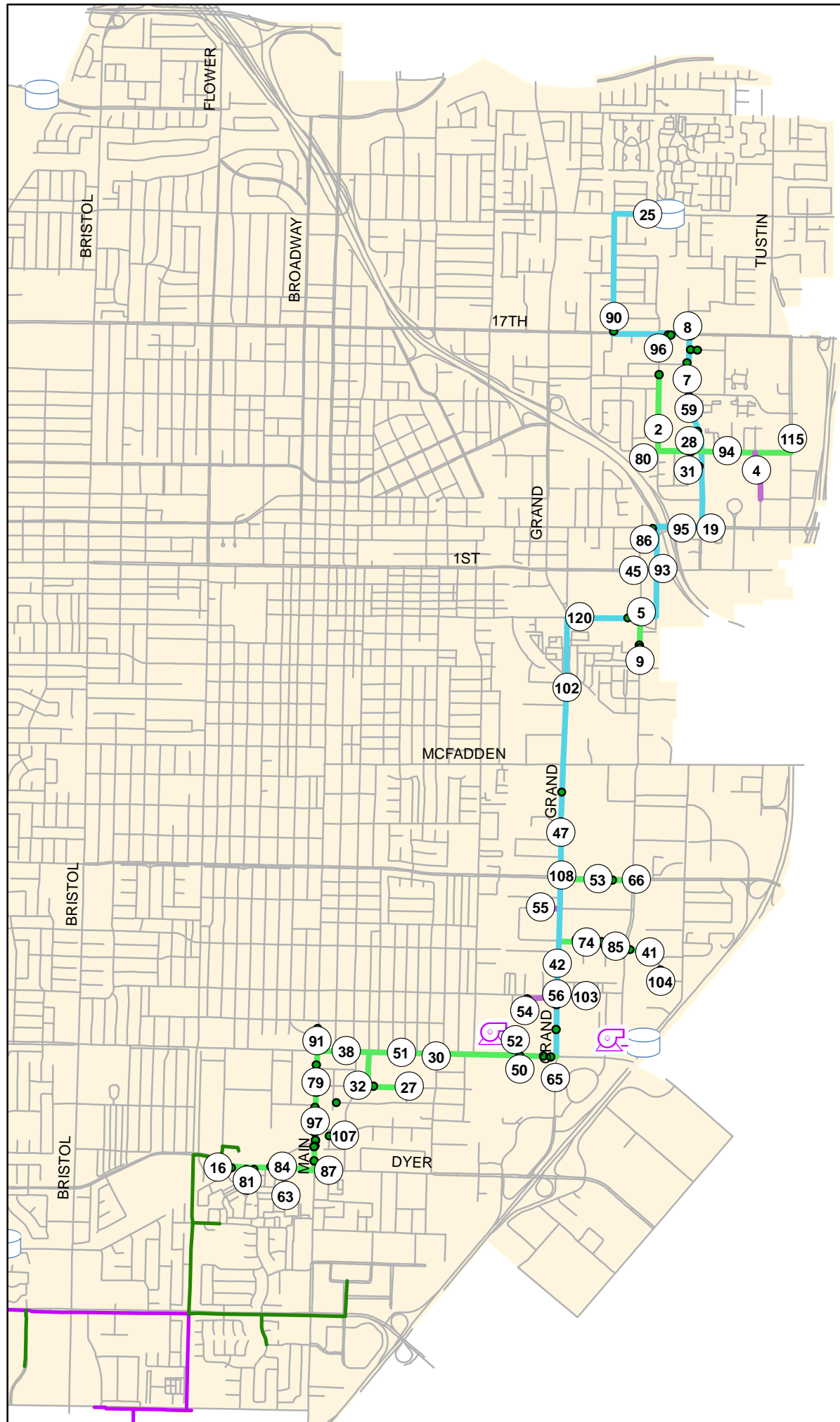
- Tank
- Phase_2_Pump
- Diameter**
- 4
- 6
- 8
- 10
- 12
- 16
- Existing_Reclaimed
- Streets
- City_Boundary



Total Potential Demand (AFY)
= 623

Phase II Customers and Alignment





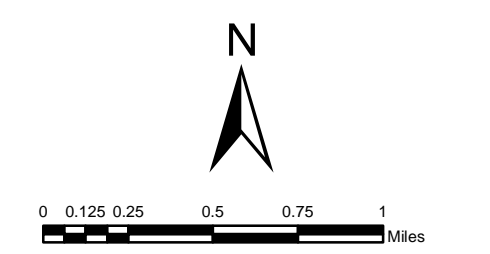
Site_No	Customer_Name	Site_No	Customer_Name
1	WARWICK SQUARE ASSOC INC	63	PMS/BRADT PL/HM ASC
2	REDWOODS HOMEOWNERS	64	PMS/BRADF PL/HM ASC
3	BDP LAS FUENTES, LLC	65	HERITAGE PAPER
4	LK DIANE/SATELLITE M	66	PACIFICENTER OWNERS ASSOCIATION
5	SADDLEBACK PARK VILL	67	PACIFICENTER OWNERS' ASSOCIATION
6	MONTEREY VILLAS MAINTENANCE ASSOCIA	68	PRES CORPORATE CENTER LLC
7	CABRILLO PARK HOA/ACT	69	WEST FLAGER, LLC DBA CITY PLACE
8	THE MONTEREY APARTMENTS	70	PARKCENTER MGM
9	VILLAGE MEADOWS PROP MGMT	71	BRADFORD WEST HOA 50
10	CITY OF SANTA ANA MEDIAN	72	MAINPLACE SHOPPINGTOWN, LLC
11	CITY OF SANTA ANA MEDIAN	73	BRADFORD PL SA 2
12	CITY OF SANTA ANA MEDIAN	74	PACIFIC CENTER OWNER, LLC
13	CITY OF SANTA ANA MEDIAN	75	WARNER GRAND PLAZA
14	CITY OF SANTA ANA MEDIAN	76	BRADFORD PLACE WEST
15	CITY OF SANTA ANA	77	BRADFORD PLACE SA 2
16	CITY OF SANTA ANA MEDIAN	78	BRADFORD PL SA #2
17	CITY OF SANTA ANA MEDIAN	79	DISCOVERY SCIENCE CENTER
18	CITY OF SANTA ANA MEDIAN	80	MABURY SQ OWNERS ASSOC
19	CITY OF SANTA ANA MEDIAN	81	BRADFORD PL II 505
20	CITY OF SANTA ANA MEDIAN	82	17TH ST PARK COMMUNITY ASS
21	CITY OF SANTA ANA MEDIAN	83	LOS OLIVOS BUS PARK
22	OCFA #72	84	LOS OLIVOS BUS PARK
23	ALTON BIKE TRAIL E OF FLOWER	85	PACIFICENTER OWNERS' ASSOCIATION
24	SANTA ANA ZOO	86	ADAPT AUTOMATION INC
25	PORTOLA PARK	87	TRUST A DUNTLEY
26	CABRILLO PARK	88	LOS OLIVOS BUS PARK
27	DELHI PARK	89	PARKCENTER MGM
28	MABURY PARK	90	17TH ST PARK COMMUNITY ASS
29	MABURY PARK	91	MC DONALD CORPORATION
30	DELHI PARK	92	O.C. APARTMENTS, LLC
31	CABRILLO TENNIS CENTER	93	5 FRWY @ 1ST ST FREEWAY IRRI
32	BIKE TRAIL	94	PARKCENTER MGM
33	PRENTICE PARK	95	BOYD SANTA ANA, LLC
34	SANTIAGO PARK	96	OHANA INVESTOR 3 LLC
35	AGNL ANTENNA LP	97	LOS OLIVOS BUSINESS PARK
36	WEST FLAGER, LLC DBA CITY PLACE	98	EXEC GUILD
37	ALPINEFRESH USA, INC.	99	LOS OLIVOS BUS PARK
38	SAVY S SUOS	100	CATHOLIC CHARITIES OF ORANGE COUNTY
39	PALMDALE AVENUE S LLC	101	IRON MOUNTAIN-SOCAL TERRITORY
40	1701 E EDINGER LLC	102	PARKHOUSE TIRE
41	FABCON CORP	103	NATHAN LEANSE
42	CENTURION PARTNERS LLC	104	RITCHEY ASSOCIATED LLC
43	MAINPLACE SHOPPINGTOWN, LLC	105	BRADFORD PL SA #2
44	BOYD SANTA ANA, LLC	106	SADDLEBACK INN L L C
45	LYON ST TRUST U T D	107	CANS FOR COINS
46	BULLOCKS SANTA ANA	108	EXCALIBER FUELS & MART
47	COUNTY OF ORANGE	109	ASHTON PROPERTIES LTD
48	COUNTY OF ORANGE	110	BT INVESTMENT
49	COUNTY OF ORANGE	111	FDTN HEALTH KAISER
50	OCFA #79	112	1750 ACQUISITIONS PARTNERS, LLC
51	MILITARY DEPT	113	CAL-TRANS MEDIAN IRRIGATION
52	EMBEE PROCESSING, INC	114	RICHARD A AYLING
53	L & N COSTUM SERVICES	115	WESTERN MEDICAL CENTER
54	EMBEE PROCESSING, INC.	116	BROOKHOLLOW OFFICE PARK
55	ACTIVE PLATING INC	117	MAINPLACE SHOPPINGTOWN, LLC
56	HOLLIDAY ROCK COMPANY, INC	118	SAUSD
57	ADVANCE MEDICAL OPTICS	119	SAUSD
58	RED ROOF INNS INC	120	SAUSD-VILLA INTERMEDIATE SCHOOL
59	PARKCENTER MGM	121	SAUSD
60	PACIFIC CENTER OWNER, LLC	122	SAUSD
61	PALMDALE AVENUE S LLC	123	NATHAN LEANSE
62	PACIFICENTER OWNERS' ASSOCIATION		

Legend

- Pumps
- Tank

Diameter

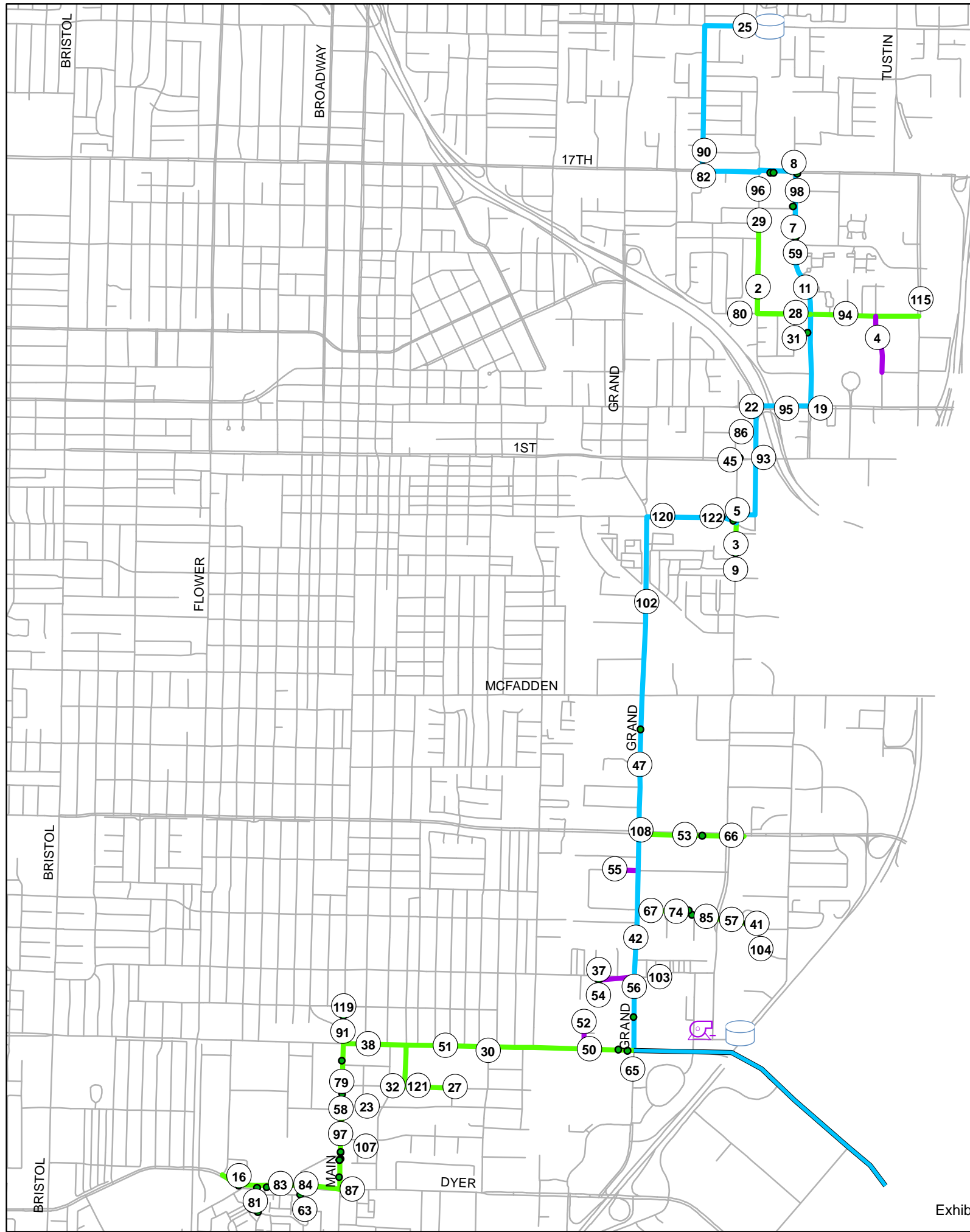
- 4
- 6
- 8
- 12
- Existing_Reclaimed
- Streets
- City_Boundary



Total Potential Demand (AFY)
= 690

Phase III Customers and Alignment





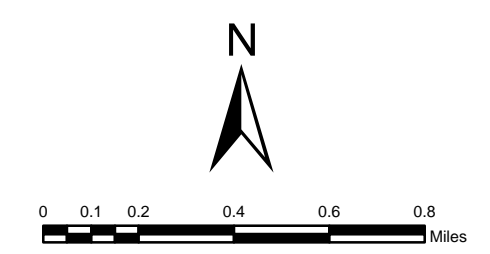
Site_No	Customer_Name	Site_No	Customer_Name
1	WARWICK SQUARE ASSOC INC	63	PMS/BRADT PL/HM ASC
2	REDWOODS HOMEOWNERS	64	PMS/BRADF PL/HM ASC
3	BDP LAS FUENTES, LLC	65	HERITAGE PAPER
4	LK DIANE/SATELLITE M	66	PACIFICENTER OWNERS ASSOCIATION
5	SADDEBACK PARK VILL	67	PACIFICENTER OWNERS' ASSOCIATION
6	MONTEREY VILLAS MAINTENANCE ASSOCIA	68	PRES CORPORATE CENTER LLC
7	CABRILLO PARK HOA/ACT	69	WEST FLAGER, LLC DBA CITY PLACE
8	THE MONTEREY APARTMENTS	70	PARKCENTER MGM
9	VILLAGE MEADOWS PROP MGMT	71	BRADFORD WEST HOA 50
10	CITY OF SANTA ANA MEDIAN	72	MAINPLACE SHOPPINGTOWN, LLC
11	CITY OF SANTA ANA MEDIAN	73	BRADFORD PL SA 2
12	CITY OF SANTA ANA MEDIAN	74	PACIFIC CENTER OWNER, LLC
13	CITY OF SANTA ANA MEDIAN	75	WARNER GRAND PLAZA
14	CITY OF SANTA ANA MEDIAN	76	BRADFORD PLACE WEST
15	CITY OF SANTA ANA	77	BRADFORD PLACE SA 2
16	CITY OF SANTA ANA MEDIAN	78	BRADFORD PL SA #2
17	CITY OF SANTA ANA MEDIAN	79	DISCOVERY SCIENCE CENTER
18	CITY OF SANTA ANA MEDIAN	80	MABURY SQ OWNERS ASSOC
19	CITY OF SANTA ANA MEDIAN	81	BRADFORD PL II 505
20	CITY OF SANTA ANA MEDIAN	82	17TH ST PARK COMMUNITY ASS
21	CITY OF SANTA ANA MEDIAN	83	LOS OLIVOS BUS PARK
22	OCFA #72	84	LOS OLIVOS BUS PARK
23	ALTON BIKE TRAIL E OF FLOWER	85	PACIFICENTER OWNERS' ASSOCIATION
24	SANTA ANA ZOO	86	ADAPT AUTOMATION INC
25	PORTOLA PARK	87	TRUST A DUNTLEY
26	CABRILLO PARK	88	LOS OLIVOS BUS PARK
27	DELHI PARK	89	PARKCENTER MGM
28	MABURY PARK	90	17TH ST PARK COMMUNITY ASS
29	MABURY PARK	91	MC DONALD CORPORATION
30	DELHI PARK	92	O.C. APARTMENTS, LLC
31	CABRILLO TENNIS CENTER	93	5 FRWY @ 1ST ST FREEWAY IRRI
32	BIKE TRAIL	94	PARKCENTER MGM
33	PRENTICE PARK	95	BOYD SANTA ANA, LLC
34	SANTIAGO PARK	96	OHANA INVESTOR 3 LLC
35	AGNL ANTENNA LP	97	LOS OLIVOS BUSINESS PARK
36	WEST FLAGER, LLC DBA CITY PLACE	98	EXEC GUILD
37	ALPINEFRESH USA, INC.	99	LOS OLIVOS BUS PARK
38	SAVY S SUOS	100	CATHOLIC CHARITIES OF ORANGE COUNTY
39	PALMDALE AVENUE S LLC	101	IRON MOUNTAIN-SOCAL TERRITORY
40	1701 E EDINGER LLC	102	PARKHOUSE TIRE
41	FABCON CORP	103	NATHAN LEANSE
42	CENTURION PARTNERS LLC	104	RITCHEY ASSOCIATED LLC
43	MAINPLACE SHOPPINGTOWN, LLC	105	BRADFORD PL SA #2
44	BOYD SANTA ANA, LLC	106	SADDEBACK INN L L C
45	LYON ST TRUST U T D	107	CANS FOR COINS
46	BULLOCKS SANTA ANA	108	EXCALIBER FUELS & MART
47	COUNTY OF ORANGE	109	ASHTON PROPERTIES LTD
48	COUNTY OF ORANGE	110	BT INVESTMENT
49	COUNTY OF ORANGE	111	FDTN HEALTH KAISER
50	OCFA #79	112	1750 ACQUISITIONS PARTNERS, LLC
51	MILITARY DEPT	113	CAL-TRANS MEDIAN IRRIGATION
52	EMBEE PROCESSING, INC	114	RICHARD A AYLING
53	L & N COSTUM SERVICES	115	WESTERN MEDICAL CENTER
54	EMBEE PROCESSING, INC.	116	BROOKHOLLOW OFFICE PARK
55	ACTIVE PLATING INC	117	MAINPLACE SHOPPINGTOWN, LLC
56	HOLLIDAY ROCK COMPANY, INC	118	SAUSD
57	ADVANCE MEDICAL OPTICS	119	SAUSD
58	RED ROOF INNS INC	120	SAUSD-VILLA INTERMEDIATE SCHOOL
59	PARKCENTER MGM	121	SAUSD
60	PACIFIC CENTER OWNER, LLC	122	SAUSD
61	PALMDALE AVENUE S LLC	123	NATHAN LEANSE
62	PACIFICENTER OWNERS' ASSOCIATION		

Legend

- Tank
- Pumps
- IRWD Extension

Diameter

- 4
- 6
- 8
- 12
- Existing_Reclaimed
- Streets

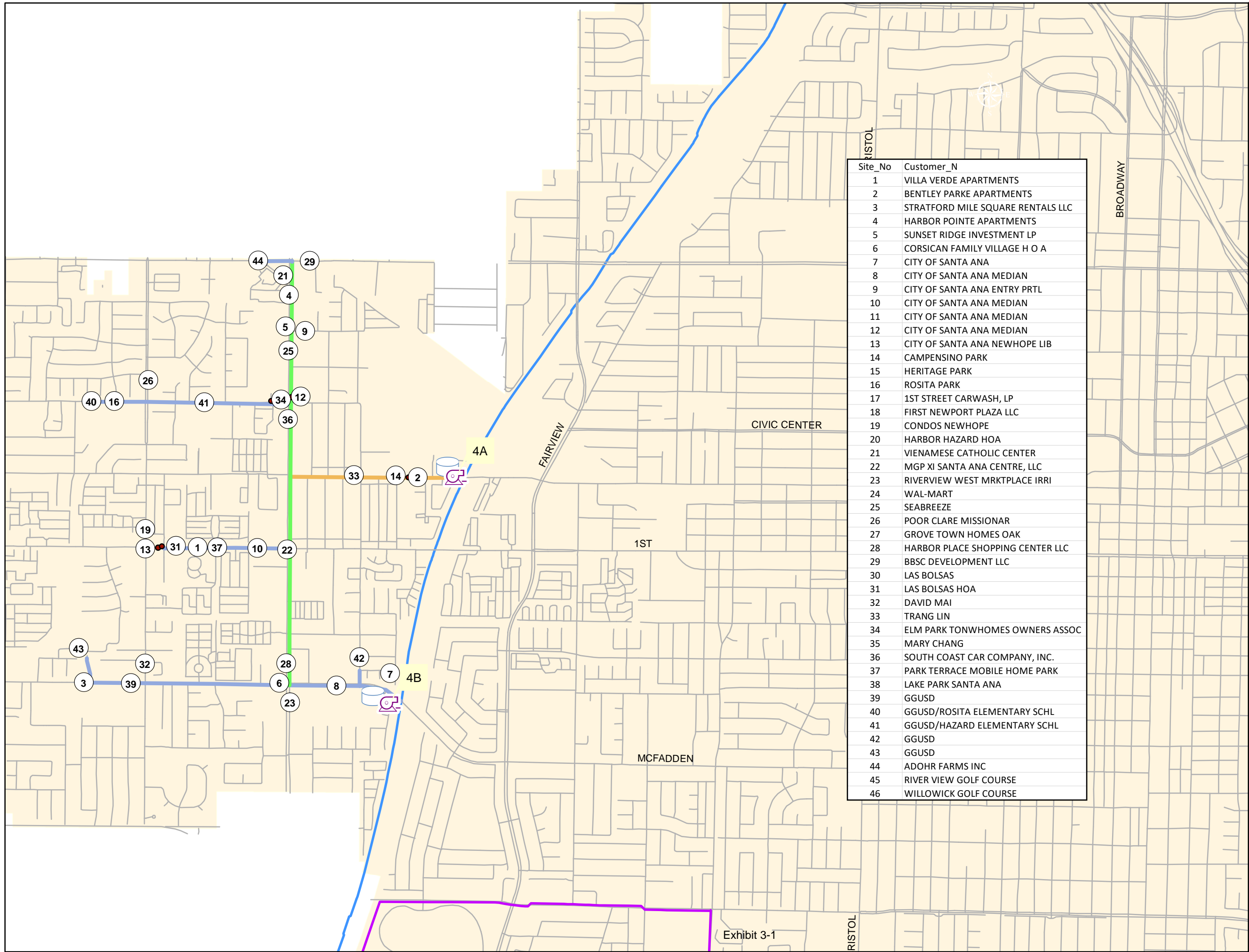


Total Potential Demand (AFY)
= 529

Phase III Customers and Alignment



Exhibit 3-1



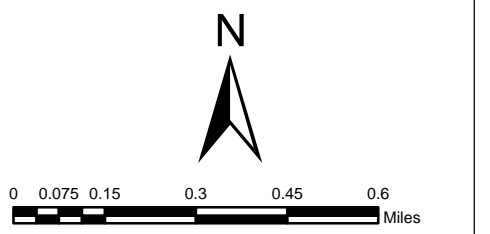
Site_No	Customer_N
1	VILLA VERDE APARTMENTS
2	BENTLEY PARKE APARTMENTS
3	STRATFORD MILE SQUARE RENTALS LLC
4	HARBOR POINTE APARTMENTS
5	SUNSET RIDGE INVESTMENT LP
6	CORSICAN FAMILY VILLAGE H O A
7	CITY OF SANTA ANA
8	CITY OF SANTA ANA MEDIAN
9	CITY OF SANTA ANA ENTRY PRTL
10	CITY OF SANTA ANA MEDIAN
11	CITY OF SANTA ANA MEDIAN
12	CITY OF SANTA ANA MEDIAN
13	CITY OF SANTA ANA NEWHOPE LIB
14	CAMPENSINO PARK
15	HERITAGE PARK
16	ROSITA PARK
17	1ST STREET CARWASH, LP
18	FIRST NEWPORT PLAZA LLC
19	CONDOS NEWHOPE
20	HARBOR HAZARD HOA
21	VIENAMESE CATHOLIC CENTER
22	MGP XI SANTA ANA CENTRE, LLC
23	RIVERVIEW WEST MRKTPLACE IRRI
24	WAL-MART
25	SEABREEZE
26	POOR CLARE MISSIONAR
27	GROVE TOWN HOMES OAK
28	HARBOR PLACE SHOPPING CENTER LLC
29	BBSC DEVELOPMENT LLC
30	LAS BOLSAS
31	LAS BOLSAS HOA
32	DAVID MAI
33	TRANG LIN
34	ELM PARK TONWHOMES OWNERS ASSOC
35	MARY CHANG
36	SOUTH COAST CAR COMPANY, INC.
37	PARK TERRACE MOBILE HOME PARK
38	LAKE PARK SANTA ANA
39	GGUSD
40	GGUSD/ROSITA ELEMENTARY SCHL
41	GGUSD/HAZARD ELEMENTARY SCHL
42	GGUSD
43	GGUSD
44	ADOHR FARMS INC
45	RIVER VIEW GOLF COURSE
46	WILLOWICK GOLF COURSE

Legend

- Phase4 Pumps
- Tank

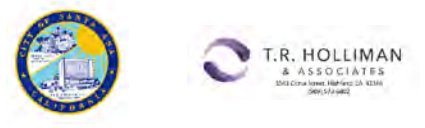
Diameter

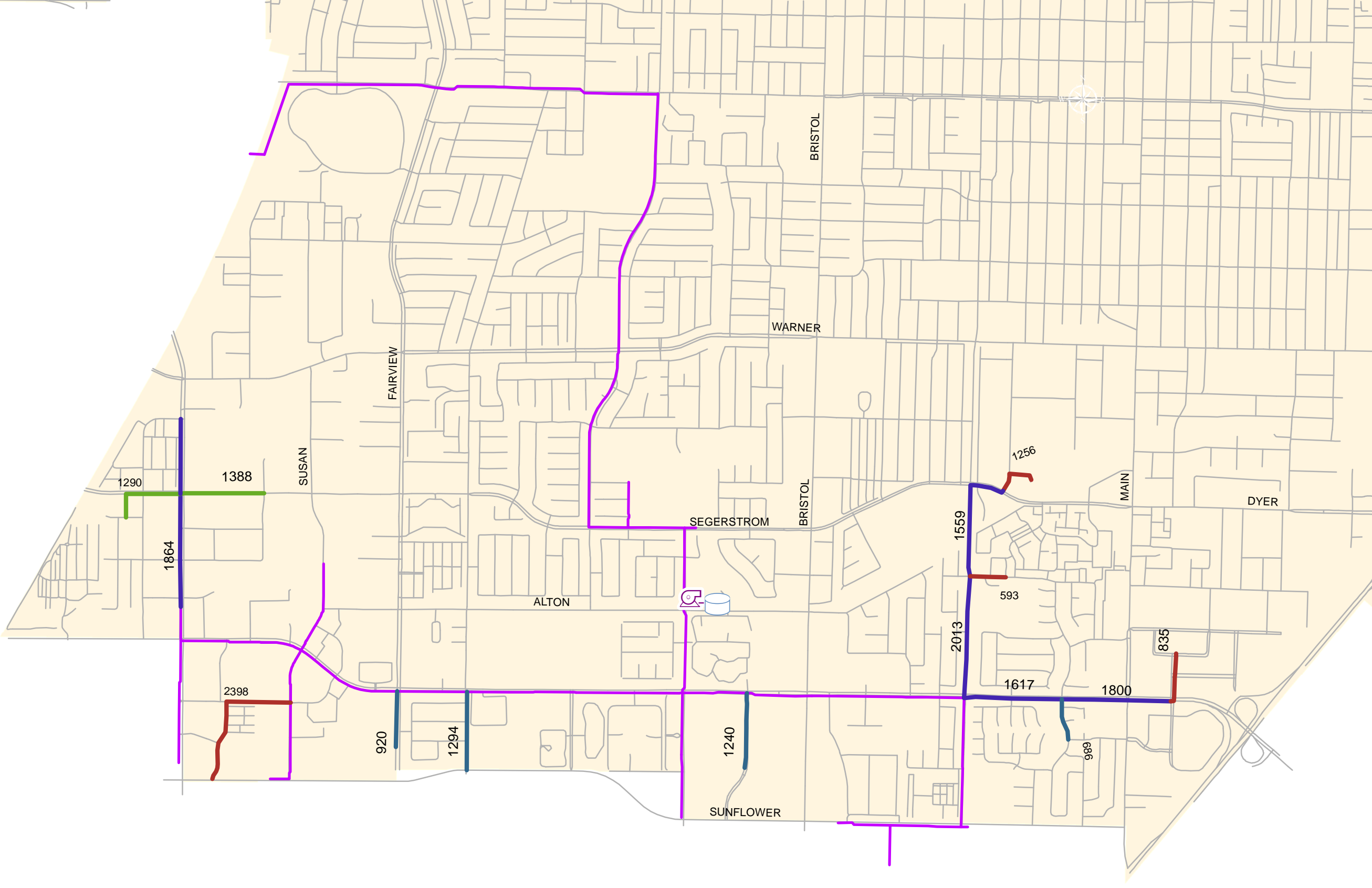
- 4
- 6
- 8
- Existing_Reclaimed
- Streets
- GWRSPipes
- City_Boundary





Total Potential Demand (AFY)
= 690

Phase III Customers and Alignment



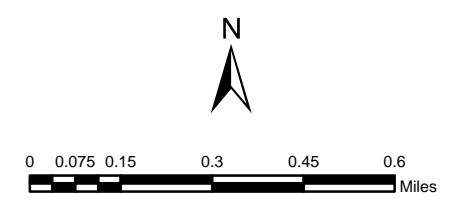


Legend

-  ExistingTank
-  ExistingPump
- Street_Label

Diameter

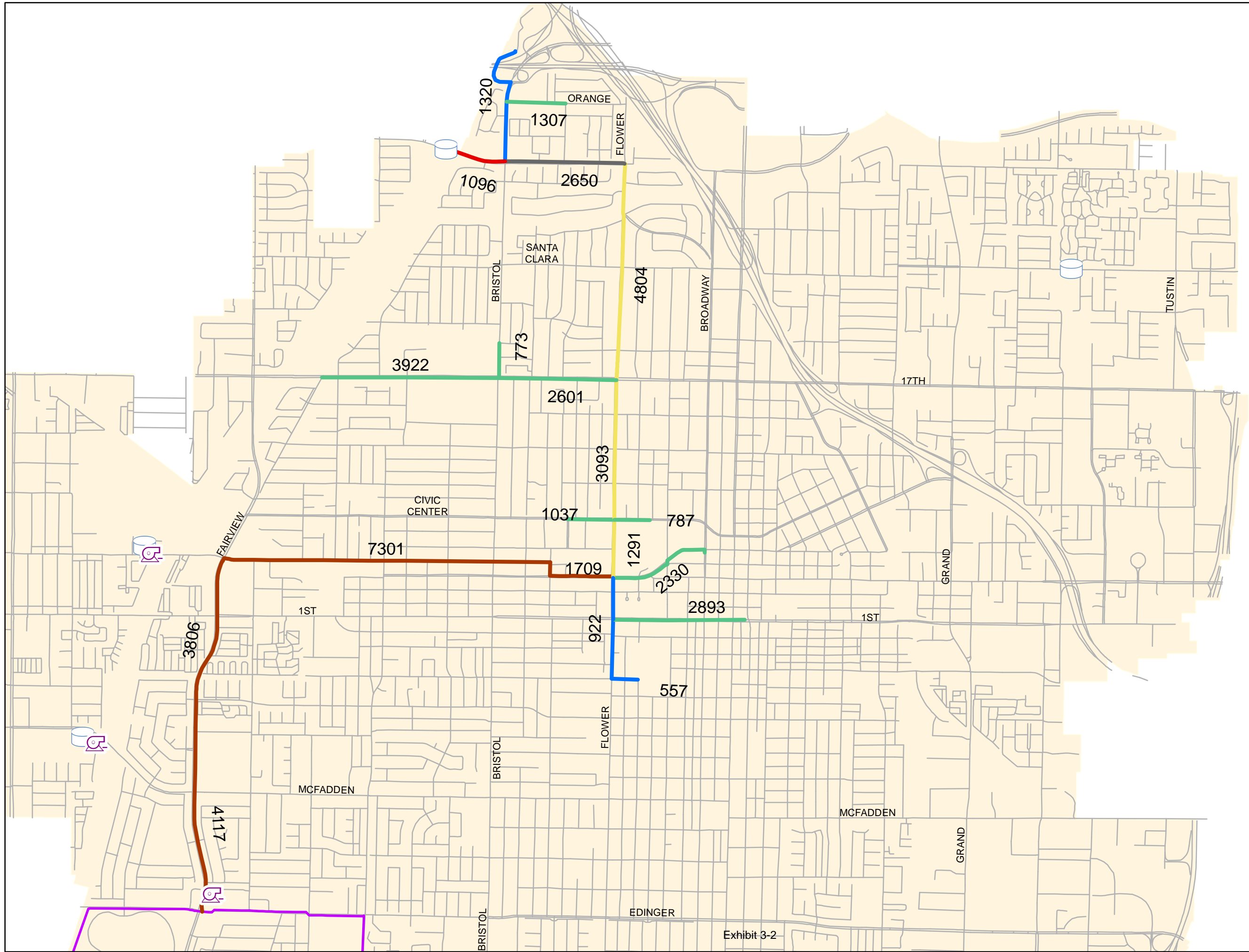
-  4
-  6
-  8
-  12
-  Existing_Reclaimed
-  Streets
-  City_Boundary








Total Potential Demand (AFY)
= 1,137

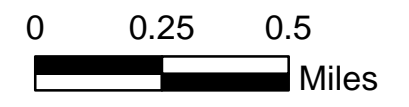
Phase I Customers and Alignment





Legend

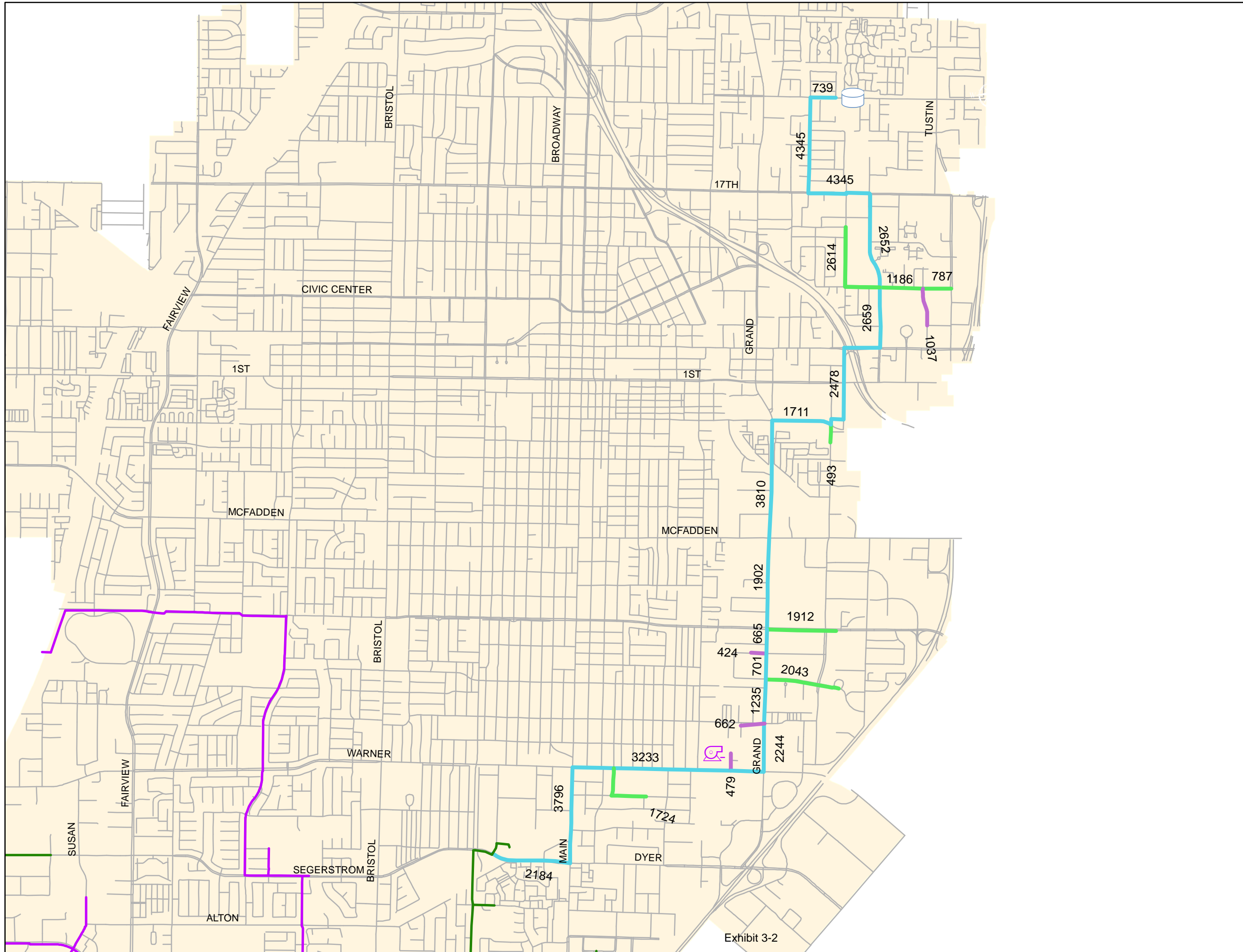
-  Pumps
-  Tank
- Diameter**
-  4
-  6
-  8
-  10
-  12
-  16
-  Existing_Reclaimed
-  Streets
-  City_Boundary





Total Potential Demand (AFY)
= 623

Phase II Customers and Alignment



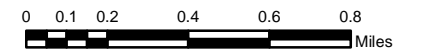


Legend

-  Pumps
-  Tank

Diameter

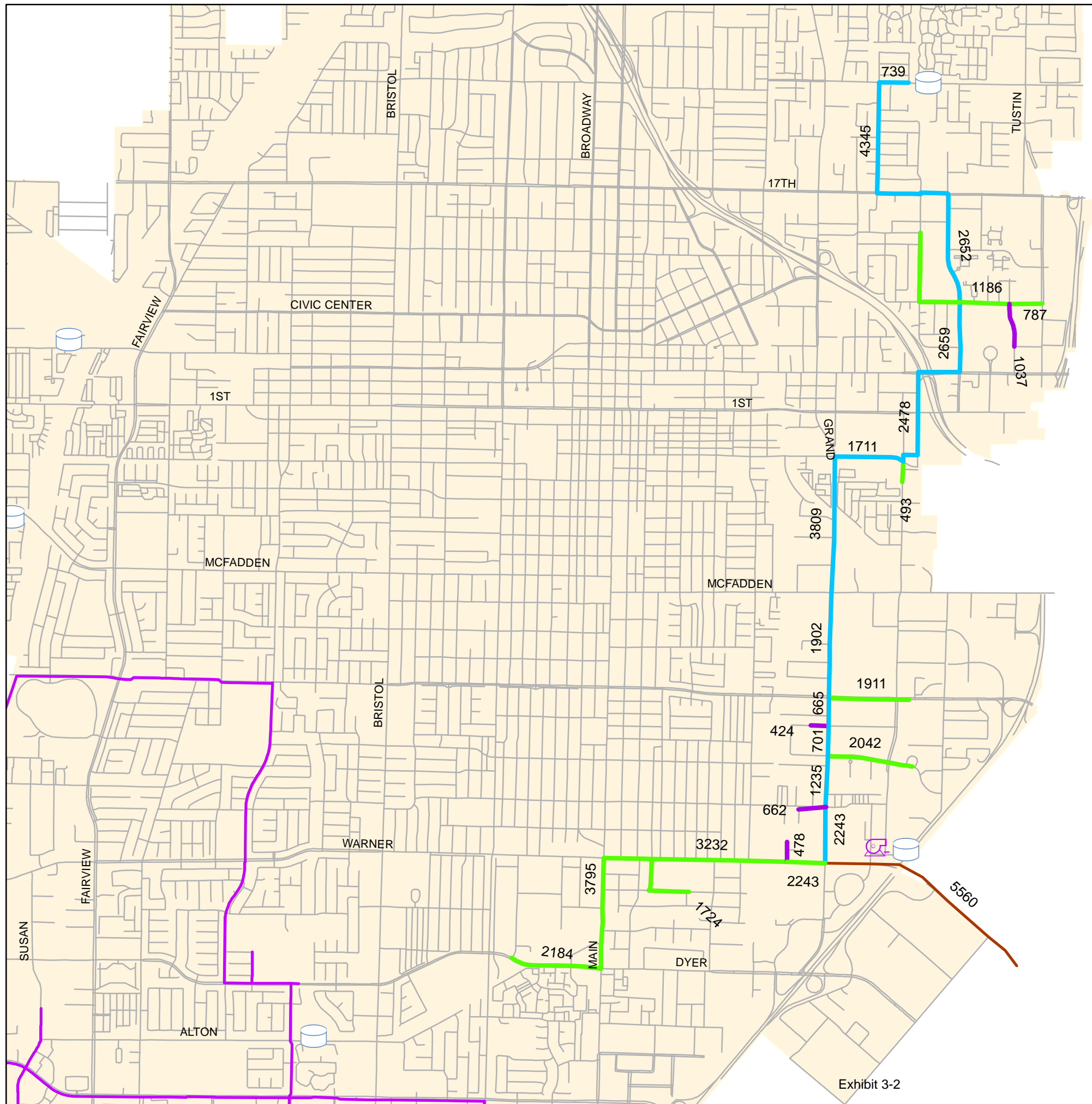
-  4
-  6
-  8
-  12
-  Existing_Reclaimed
-  Streets
-  City_Boundary













Total Potential Demand (AFY)
= 529

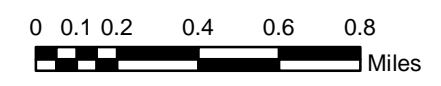
Phase IIIA Customers and Alignment





Legend

-  Pump
-  Tank
- Diameter**
-  4
-  6
-  8
-  12
-  IRWD Extension
-  Existing_Reclaimed
-  Streets
-  City_Boundary

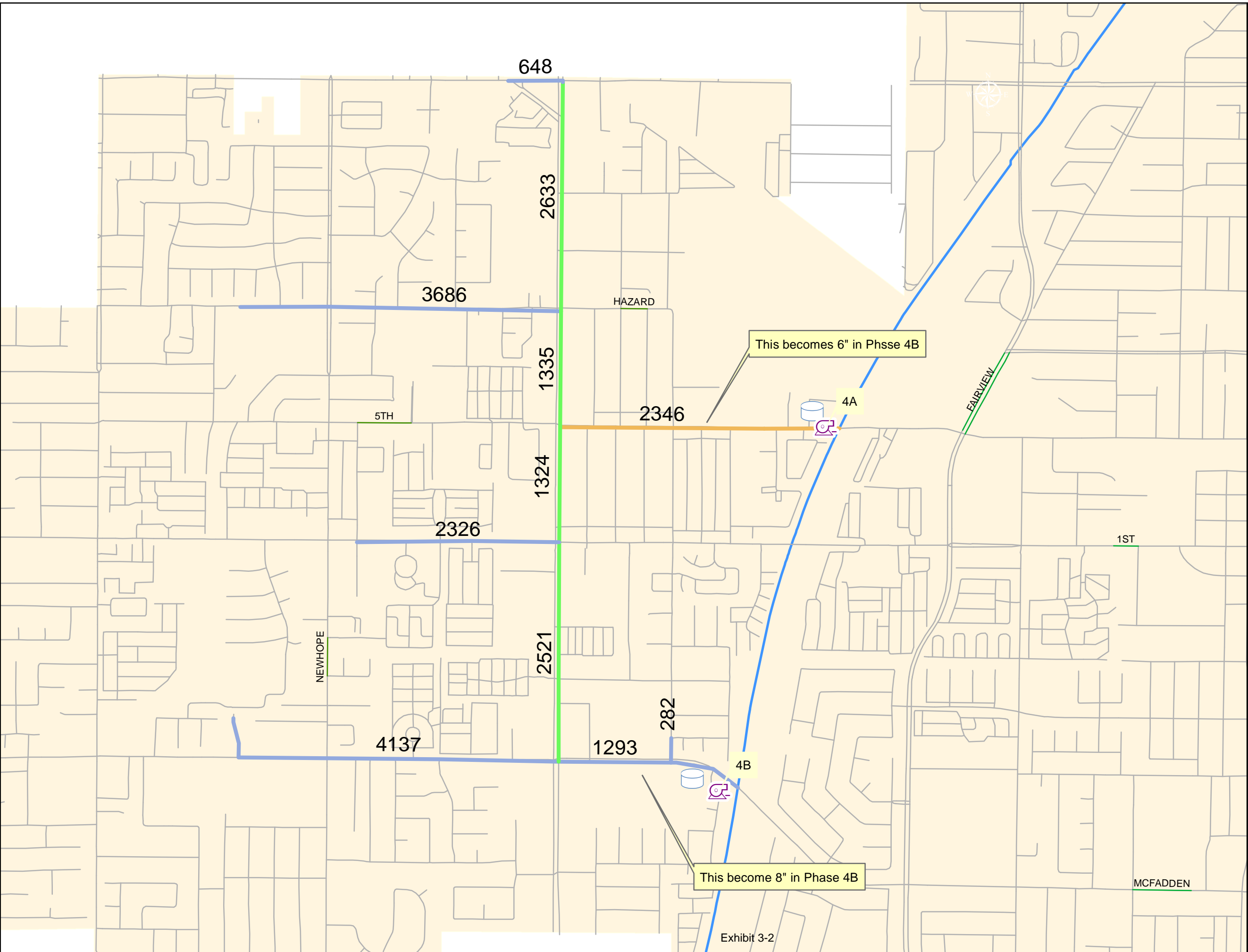


Total Potential Demand (AFY)
= 529

Phase IIIB Customers and Alignment



Exhibit 3-2

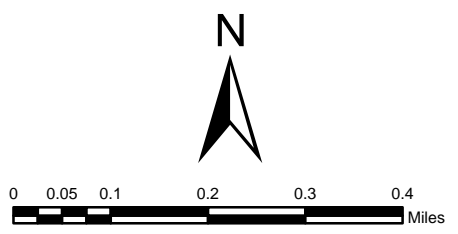


Legend

- Phase4Pumps
- Tank

Diameter

- 4
- 6
- 8
- Exiting_Reclaimed
- GWRSPipes
- Streets
- City_Boundary



Total Potential Demand (AFY)
= 690

Phase 4 Customers and Alignment



We Keep It Flowing.



2017 WATER QUALITY REPORT

Water Quality



Learn about the sources and quality of your drinking water, how we monitor it and protect it.

Sustainability



Discover how you can do your part to prevent water waste and conserve our most precious resource.

Santa Ana News



Read about the latest news, upcoming events, current rebate programs and more.



On behalf of the City of Santa Ana Public Works Agency, I am pleased to present this Annual Consumer Confidence Report.



The overriding theme of this year's water quality report is long term sustainability.

Sustainability goes beyond the environment. It is the long term good of the whole community. That means, as your Public Works Agency, we make decisions that are simultaneously beneficial for Santa Ana's residents, economic development and overall quality of life as well as the environment.

This holistic approach is what drives the timing and execution of our street repairs and expansions, alternative transportation and traffic management solutions, pedestrian safety improvements, as well as water and sewer infrastructure upgrades. For example, we work closely with our engineers to carefully plan water and sewer infrastructure upgrades in conjunction with street improvements. In this way, when we repave streets and repair sidewalks or lay down tracks for a new trolley system, the replacement of aging pipelines underground will already be in place. We continually balance and prioritize long range projects with the immediate issues most important to you.

- **OC Streetcar.** Construction of this \$300 million trolley system, which is fully funded through federal and local grants, will begin this fall. After its completion in 2020, the OC Streetcar will provide "green" mass transit from the Santa Ana Regional Transportation Center (SARTC), through Santa Ana's civic center and downtown district before finally connecting to a future transit hub in Garden Grove.

- **Enterprise Asset Management System.** In keeping with our holistic approach to public works, a new integrated system will be online in 2020 to improve the efficiency and management of our fixed assets, inventory, service requests and

work orders across multiple public works divisions. Detailed reporting and analytics will enable us to prioritize and plan future projects more effectively. An online portal for residents will allow you to report and track service issues as well as city improvements in real-time.

- **New Solid Waste Contract.** As we work on procuring a new qualified service provider for 2020, we are developing a more comprehensive "green" policy relative to solid waste management and recycling.

- **LED Street Lights.** We are purchasing streetlights from Southern California Edison and will be retrofitting them with LED fixtures this year to improve street lighting, save energy costs and reduce carbon emissions. To maximize this asset, we will use these streetlights to facilitate a citywide broadband network and telecommunications system utilizing fiber optic technology.

We are excited about the benefit these projects will bring to Santa Ana.

This is your community. Our public works infrastructure belongs to you. We want to make sure the investments we make meet what you need most.

We invite you to get involved and voice your ideas so we get a clear idea of your priorities and what we want to achieve together.

We are all stewards of Santa Ana. Together, we can help keep our city vital for future generations to come.

Edwin 'William' Galvez
Acting Executive Director
Public Works Agency
City of Santa Ana

Senate Bill 1

This November, a measure to repeal SB 1 will be on the ballot. This bill was passed in 2017 to fund transportation improvement projects, including projects in Santa Ana. Be sure to read about SB1 so you can be informed when you vote at the polls this fall.

2 Water Quality



16 Sustainability



19 Santa Ana News



the nation's best
Santa Ana's tasting and
Tap Water: highest quality

What is a CCR?



The Consumer Confidence Report (CCR) is an annual water quality report that informs you where your drinking water comes from and what's in it.

Read this report to learn more about the water provided by Santa Ana and what the City is doing to ensure the highest quality of water is delivered to you year after year.

The following questions and answers, numbers 1 through 7, will explain the important elements of the data tables and more.

1. Where does Santa Ana get its water?

The City of Santa Ana relies on two sources for the 12.5 billion gallons of water we supply each year.

Groundwater — 70% is groundwater which accumulates and is stored beneath the surface of the earth and then pumped to the surface by 20 city-owned wells.

Imported — 30% is imported water purchased from Metropolitan Water District of Southern California (MWD). MWD is a regional wholesaler that provides water for 26 member public agencies like Santa Ana throughout Los Angeles, Orange, Riverside, San Bernardino, San Diego and Ventura counties. MWD brings Colorado River water from Lake Havasu through the 242-mile Colorado River Aqueduct. It also transports water from Northern California via the State Water Project's 444-mile California Aqueduct. The water is then treated at either the Diemer Filtration Plant in Yorba Linda or the Weymouth Water Treatment Plant in the City of La Verne before it is delivered to Santa Ana. There are seven MWD connections located in Santa Ana.

Most of our customers receive a blending of these two sources. You can read about the water quality standards for each of these sources in the data tables. We have

listed groundwater and imported water in separate tables. An additional table lists the water quality standards for Santa Ana's water distribution system.

2. What's in my drinking water?

Your tap water may contain different types of chemicals (organic and inorganic), microscopic organisms (e.g., bacteria, algae, viruses) and radioactive materials (radionuclides), many of which are naturally occurring. Health agencies require monitoring for these constituents or substances, because at certain levels they could make a person sick.

3. What are the maximum allowed levels for constituents in drinking water?

Health agencies have maximum contaminant levels (MCL) for constituents so that drinking water is safe and looks, tastes and smells good. A few constituents have the letters "TT" (Treatment Technique) in the MCL column because they do not have a numerical MCL. Instead, they have certain treatment requirements that have to be met. One of the constituents, total chlorine residual, has an MRDL (maximum residual disinfection level) instead of an MCL.

The MRDL is the maximum level of a disinfectant added for water treatment that is allowed in water. While disinfectants are necessary to kill harmful microbes, drinking water regulations protect against too much disinfectant being added. Another constituent, turbidity, has a requirement that 95 percent of the measurements taken must be below a certain number. Turbidity is a measure of the cloudiness of the water. We monitor it because it is a good indicator of the efficiency of the filtration system.



Courtesy of The Metropolitan Water District of Southern California



Courtesy of The Metropolitan Water District of Southern California

What is a CCR?



4. Why are some of the constituents listed in the section labeled “Primary Standards” and others in the “Secondary Standards”?

Constituents that are grouped in the “Primary Standards” section may be unhealthy at certain levels. Constituents that are grouped under the “Secondary Standards” section can affect the appearance, taste and smell of water, but do not affect the safety of the water unless they also have a primary standard. Some constituents (e.g., aluminum) have two different MCLs, one for health-related impacts, and another for non-health-related impacts.

5. How do I know how much of a constituent is in my water and if it is at a safe level?

With a few exceptions, if the average amount of a constituent found in tap water over the course of a year is no greater than the MCL, then the regulatory requirements are considered to be satisfied. The highest and lowest levels measured over a year are shown in the range. Requirements for safety, appearance, taste and smell are based on the average levels recorded and not the range.

6. How do constituents get into our water supply?

Drinking water (tap water and bottled water) comes from rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or human activity. Contaminants that may be present in source water include:

- **Microbial contaminants**, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- **Inorganic contaminants**, such as salts and metals, that can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.
- **Pesticides and herbicides** that may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- **Organic chemical contaminants**, including synthetic and volatile organic chemicals that are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural application and septic systems.
- **Radioactive contaminants** that can be naturally-occurring or be the result of oil and gas production and mining activities.



Courtesy of The Metropolitan Water District of Southern California

What is a CCR?



7. Are there any potential sources of contamination in our system?

Groundwater—An assessment of the drinking water wells for the City of Santa Ana was completed in December 2017. Santa Ana’s wells are considered most vulnerable to historic agricultural activities, golf courses, and application of fertilizers, which are associated with contaminants detected in the water supply. Our wells are also considered most vulnerable to chemical/petroleum pipelines, chemical/petroleum processing/stores, dry cleaners, gas stations, junk/ scrap/salvage yards, metal plating/finishing/fabrication, plastics/synthetics producers, and sewer collection systems, although constituents associated with these activities were not detected.

Imported Water—Every five years, MWD is required by the Division of Drinking Water (DDW) to examine possible sources of drinking water contamination in its State Water Project and Colorado River source waters. MWD submitted to DDW its most recent Watershed Sanitary Surveys: the Colorado River Watershed Sanitary Survey-2015 Update and the State Water Project Watershed Sanitary Survey-2016 Update. You can request a copy of the most recent Watershed Sanitary Surveys by calling MWD at 800.CALL.MWD.



Protecting Our Source Water

Safeguarding our water is everyone’s responsibility. Here’s what you can do to help protect Santa Ana’s drinking water source:

- Limit your use of fertilizers and pesticides. The hazardous chemicals in both can reach our drinking water source.
- Pick up after your pets.
- Dispose of chemicals properly; take used motor oil and paint to recycling center.
- Find a watershed protection organization, like the Santa Ana Watershed Association, and volunteer to help.





Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. You can learn more about contaminants and potential health effects by calling the U.S. Environmental Protection Agency's (USEPA) Safe Drinking Water Hotline at 800-426-4791 or visiting the website at epa.gov/safewater.

In order to ensure that tap water is safe to drink, USEPA and the State Water Resources Control Board (State Board) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The U.S. Food and Drug Administration regulations and California law also establish limits for contaminants in bottled water that provide the same protection for public health. Additional information on bottled water is available on the California Department of Public Health website: http://bit.ly/CDPH_FAQs

People with Weakened Immune Systems

Although Santa Ana meets all drinking water standards, some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers.

[USEPA/Centers for Disease Control \(CDC\) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline at 800-426-4791.](#)



water & your health



Cryptosporidium.

Cryptosporidium is a microbial pathogen found in surface water throughout the U.S. To date, cryptosporidium has not been detected in our water supply. USEPA/ CDC (U.S. Centers for Disease Control and Prevention) guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline at 800-426-4791. For more information, visit cdc.gov/parasites/crypto/index.html.

Fluoride.

The City of Santa Ana receives approximately 30 percent of its water supply from MWD. Beginning in October 2007, MWD joined a majority of the nation's public water suppliers in adding fluoride to the treated water it supplies to state water agencies, a plan approved by the CDC and the State Water Resources Control Board (SWRCB). Santa Ana's well water has a naturally occurring fluoride range level of 0.18 to 0.5 parts per million (ppm). Water provided by MWD has been adjusted to the optimal level for dental health of 0.7 to 0.8 ppm. Additional information may be found by calling MWD's Water Quality Information Hotline at 800-354-4420. You can also download MWD's fact sheet at <http://bit.ly/MWDFluoridation> or visit ada.org/fluoride.aspx.

Hexavalent Chromium.

Hexavalent chromium, also known as chromium-6, can be present in water due to natural geologic conditions or from industrial pollution. Long-term exposure to the metal may cause cancer.

California became the first state in the nation to issue a drinking water standard for chromium-6 when it set the MCL at 10

parts per billion (ppb) in 2014. However, a 2017 court ruling concluded compliance with the MCL was not economically feasible.

California's State Water Board is working on adopting a new MCL. Meanwhile, the state MCL for total chromium of 50 ppb will remain in place. Total chromium measures both trivalent and hexavalent chromium in water together and does not indicate how much of either type exists. Trivalent chromium is not considered toxic and is an essential nutrient in trace amounts. The U.S. Environmental Protection Agency's MCL for total chromium is 100 ppb.

Lead.

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Santa Ana is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you do so, you may wish to collect the flushed water and reuse it for another beneficial purpose, such as watering plants. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at epa.gov/lead.





Courtesy of The Metropolitan Water District of Southern California



Nitrate:

Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. Nitrate in drinking water at levels above 10 mg/L is a health risk for infants of less than six months of age. Such nitrate levels in drinking water can interfere with the capacity of the infant's blood to carry oxygen, resulting in a serious illness. Symptoms include shortness of breath and blueness of the skin. Nitrate levels above 10 mg/L may also affect the ability of the blood to carry oxygen in other individuals, such as pregnant women and those with certain specific enzyme deficiencies. If you are caring for an infant, or you are pregnant, you should ask advice from your health care provider.

Radon:

Radon is a radioactive gas that you can't see, taste, or smell. It is found throughout the U.S. Radon can move through the ground and into a home through cracks and holes in the foundation. Radon can build up in high levels in all types of homes. Radon can also get into indoor air when released from tap water from showering, washing dishes, and other household activities. Compared to radon entering the home through soil, radon entering the home through tap water will in most cases be a small source of radon in indoor air. Radon is a known human carcinogen. Breathing air containing radon can lead to lung cancer. Drinking water containing radon may also cause increased risk of stomach cancer. If you are concerned about radon in your home, test the air in your home. Testing is inexpensive and easy. Fix your home if the level of radon in your air is 4 picocuries per liter of air (pCi/L) or higher. There are simple ways to fix a radon problem that aren't too costly. For additional information, call the California radon program at 800-745-7236, the USEPA Safe Drinking Water Act Hotline at 800-426-4791 or the National Safety Council Radon Hotline at 800-767-7236.

Perchlorate:

Perchlorate has been shown to interfere with uptake of iodide by the thyroid gland, and to thereby reduce the production of thyroid hormones, leading to adverse effects associated with inadequate hormone levels. Thyroid hormones are needed for normal prenatal growth and development of the fetus, as well as for normal growth and development in the infant and child. In adults, thyroid hormones are needed for normal metabolism and mental function.



Use this glossary to understand the terms, abbreviations, quality standards, and measurements used in the data tables.

Terms & Abbreviations

Constituents

Components or elements found in drinking water.

Maximum Contaminant Level (MCL)

The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

Maximum Contaminant Level Goal (MCLG)

The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the USEPA.

Maximum Residual Disinfectant Level (MRDL)

The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG)

The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Primary Drinking Water Standard (PDWS)

The MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

Public Health Goal (PHG)

The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency (Cal/EPA).

Regulatory Action Level

The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements that a water system must follow.

Treatment Technique (TT)

A required process intended to reduce the level of contaminants in drinking water that are difficult and sometimes impossible to measure directly.

Additional Abbreviations

AL = Regulatory Action Level

CFU = Colony-Forming Units

MFL = Million Fibers per Liter

NA = Not Applicable

NC = Not Collected

ND = Not Detected

NL = Notification Level

NR = Not Required

NS = No Standard



Measurements

Santa Ana conducts extensive sampling and testing to ensure your water meets all water quality standards. In 2017, over 11,000 samples were collected at various sampling points throughout the City's water system, all of which were below state and federal maximum allowable levels. Contaminants are measured in:

Parts per million (ppm) or milligrams per liter (mg/L)

Parts per billion (ppb) or micrograms per liter (µg/L)

Parts per trillion (ppt) or nanograms per liter (ng/L)

Parts per quadrillion (ppq) or picograms per liter

PicoCuries per liter (pCi/L)

A measurement of radioactivity in water.

Millirems per year (mrem/year)

A measurement of radiation absorbed by the body.

Micromhos per centimeter (umho/cm)

Grains per gallon (grains/gal)

A measurement of water hardness often used for sizing household water softeners. One grain per gallon is equal to 17.1 mg/L of hardness.

Nephelometric Turbidity Units (NTU)

A measurement of the clarity of water. Turbidity in excess of 5 NTU is noticeable to the average person.

Quality Standards

Primary Standards

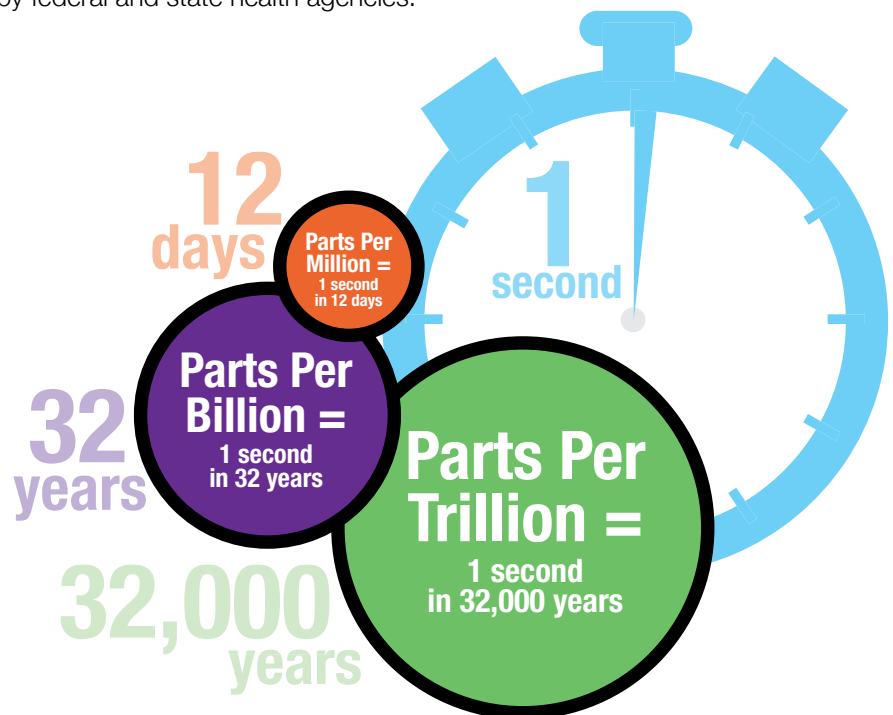
Mandatory health-related standards that may cause health problems in drinking water.

Secondary Standards

Aesthetic standards (non health-related) that could cause odor, taste, or appearance problems in drinking water.

Unregulated Parameters

Information about contaminants that are monitored, but are not currently regulated by federal and state health agencies.



How are the detection levels we measure equivalent to time?

How To Read The Data Tables



You will find three data tables showing a list of constituents tested in each of the following water sources:

- Santa Ana Distribution System
- Santa Ana Groundwater
- Metropolitan Water District of Southern California Treated Surface Water

For each table, begin with the Constituent and read across.

- 1 The column marked “Constituents” lists the substances found in the water Santa Ana delivers.
- 2 MCL is the highest level of substance (contaminant) allowed. MCLG is the goal level for that substance (this may be lower than what is allowed).
- 3 Average Amount is the average level measured for the substance (less is better).
- 4 Range of Detections is the highest and lowest amounts measured.
- 5 A “No” under MCL Violation indicates government requirements were met.
- 6 Typical Sources in Drinking Water tells you where the constituent usually originates.

Note: “Unregulated Constituents” are measured, but maximum allowed contaminant (MCL) levels have not been established by the government.





2017 Water Quality Table



2017 CITY OF SANTA ANA DISTRIBUTION SYSTEM WATER QUALITY

1 Constituents	2 MCL (MRDL/MRDLG)	3 Average Amount	4 Range of Detections	5 MCL Violation?	6 Typical Source in Drinking Water
DISINFECTANT RESIDUAL AND DISINFECTION BY-PRODUCTS					
Chlorine Residual (ppm)	(4 / 4)	1.1	ND - 2.98	No	Disinfectant Added for Treatment
Total Trihalomethanes (ppb) ¹	80	35	ND - 38	No	Byproducts of Chlorine Disinfection
Haloacetic Acids (ppb) ¹	60	12	ND - 16	No	Byproducts of Chlorine Disinfection
AESTHETIC QUALITY					
Odor (threshold odor number)	3*	1	1 - 2	No	Naturally-occurring organic materials
Turbidity (ntu)	5*	<01	ND - 1.3	No	Erosion of natural deposits

*Chemical is regulated by a secondary standard to maintain aesthetic qualities (color, odor, and taste).

Microbiological	MCL	MCLG	Highest Monthly Percent Positives	MCL Violation?	Typical Sources in Drinking Water
Total Coliform Bacteria ²	5.0	0	0.5%	No	Naturally present in the environment

LEAD AND COPPER ACTION LEVELS AT RESIDENTIAL TAPS

Constituents	Action Level (AL)	Public Health Goal	90th Percentile Value	Sites Exceeding AL / Number of Sites	AL Violation?	Typical Source in Drinking Water
Lead (ppb) ³	15	0.2	ND	0 / 80	No	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits
Copper (ppm) ³	1.3	0.3	0.17	0 / 80	No	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits

In 2015, 80 residences were tested for lead and copper at-the-tap. Lead was not detected in any of the samples. Copper was detected in 66 samples, none of which exceeded the AL for copper. A regulatory action level is the concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow. In 2017, no school submitted request to be sampled for lead.

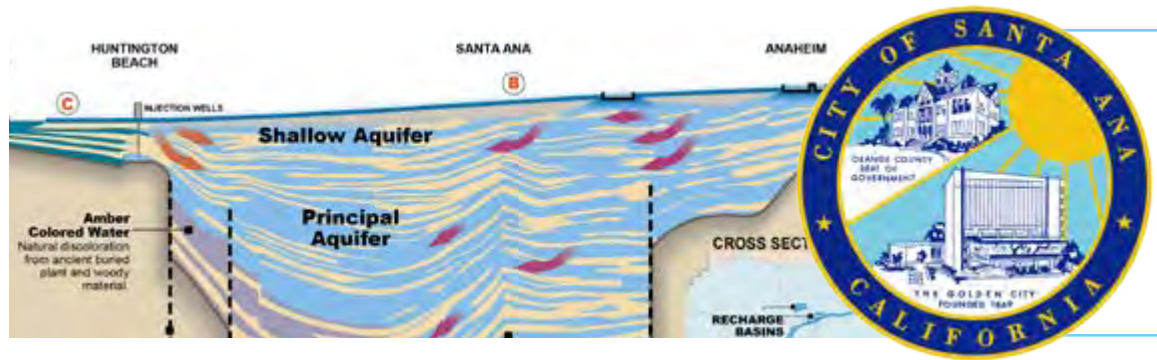
UNREGULATED CHEMICALS REQUIRING MONITORING IN THE DISTRIBUTION SYSTEM

Constituents	Notification Level	PHG	Average Amount	Range of Detections	Most Recent Sampling Date
Chlorate (ppb)	800	n/a	49.8	37.5 - 85.8	2014
Chromium, Hexavalent (ppb)	n/a	0.02**	0.73	0.09 - 1.1	2014
Chromium, Total (ppb) ***	MCL = 50	MCLG = 100	0.56	ND - 0.9	2014
Molybdenum, Total (ppb)	n/a	n/a	4.38	3.8 - 5.2	2014
Strontium, Total (ppb)	n/a	n/a	715	547 - 959	2014
Vanadium, Total (ppb)	50	n/a	2.8	2.3 - 2.8	2014

** There is currently no MCL for hexavalent chromium. The previous MCL of 10 ppb was withdrawn on September 11, 2017.

*** Total chromium is regulated with an MCL of 50 ppb but was not detected, based on the detection limit for purposes of reporting of 10 ppb. Total chromium was included as part of the unregulated chemicals requiring monitoring.

2017 Water Quality Table



2017 CITY OF SANTA ANA GROUNDWATER QUALITY

Constituents	MCL	PHG (MCLG)	Average Amount	Range of Detections	MCL Violation?	Most Recent Sampling Date	Typical Source in Drinking Water
Radiologicals							
Uranium (pCi/l)	20	0.43	3.13	ND - 5.85	No	2017	Erosion of Natural Deposits
Inorganic Constituents							
Arsenic (ppb)	10	0.004	< 2	ND - 2.5	No	2017	Erosion of Natural Deposits
Barium (ppm)	1	2	< 0.1	ND - 0.151	No	2017	Erosion of Natural Deposits
Fluoride (ppm)	2	1	0.35	0.18 - 0.5	No	2017	Erosion of Natural Deposits
Nitrate (ppm as N)	10	10	1.9	ND - 3.4	No	2017	Runoff and Leaching from Fertilizer Use; Leaching from Septic Tanks and Sewage; Erosion of Natural Deposits
Nitrate + Nitrite (ppm as N)	10	10	1.9	ND - 3.4	No	2017	Runoff and Leaching from Fertilizer Use; Leaching from Septic Tanks and Sewage; Erosion of Natural Deposits
Perchlorate (ppb)	6	1	< 4	ND - 5.1	No	2017	Discharge from Industrial Operations
Secondary Standards*							
Chloride (ppm)	500*	n/a	51.1	20.4 - 99	No	2017	Erosion of Natural Deposits
Specific Conductance (umho/cm)	1,600*	n/a	660	439 - 995	No	2017	Substance that forms ions when in water
Sulfate (ppm)	500*	n/a	89	47.7 - 134	No	2017	Erosion of Natural Deposits
Total Dissolved Solids (ppm)	1,000*	n/a	403	256 - 602	No	2017	Erosion of Natural Deposits
Turbidity (ntu)	5*	n/a	< 0.1	ND - 0.2	No	2017	Soil Runoff
Unregulated Constituents							
Alkalinity, total as CaCO ₃ (ppm)	Not Regulated	n/a	167	144 - 216	n/a	2017	Erosion of Natural Deposits
Bicarbonate (ppm HCO ₃)	Not Regulated	n/a	204	176 - 263	n/a	2017	Erosion of Natural Deposits
Boron (ppm)	NL=1	n/a	< 0.1	ND - 0.21	n/a	2017	Erosion of Natural Deposits
Calcium (ppm)	Not Regulated	n/a	74.1	35.9 - 119	n/a	2017	Erosion of Natural Deposits
Hardness, total (grains/gallon)	Not Regulated	n/a	14.2	7 - 22.8	n/a	2017	Erosion of Natural Deposits
Hardness, total (ppm as CaCO ₃)	Not Regulated	n/a	242	119 - 385	n/a	2017	Erosion of Natural Deposits
Magnesium (ppm)	Not Regulated	n/a	14.1	7.1 - 21.5	n/a	2017	Erosion of Natural Deposits
pH (pH units)	Not Regulated	n/a	7.8	7.5 - 8	n/a	2017	Acidity Hydrogen Ions
Potassium (ppm)	Not Regulated	n/a	2.3	1.3 - 3.1	n/a	2017	Erosion of Natural Deposits
Sodium (ppm)	Not Regulated	n/a	45.6	35.5 - 66.7	n/a	2017	Erosion of Natural Deposits

* Contaminant is regulated by a secondary standard to maintain aesthetic qualities (taste, odor, color).

**There is currently no MCL for hexavalent chromium. The previous MCL of 10 ppb was withdrawn on September 11, 2017.

UNREGULATED CHEMICALS REQUIRING MONITORING

Constituents	Notification Level	PHG	Average Amount	Range of Detections	Most Recent Sampling Date
1,4-Dioxane (ppb)	1	n/a	0.14	ND - 0.24	2014
Chlorate (ppb)	800	n/a	63.3	21.1 - 249	2014
Chromium, Hexavalent (ppb)	n/a	0.02**	1.01	0.21 - 2.06	2014
Chromium, Total (ppb) ***	MCL = 50	MCLG = 100	0.85	ND - 1.8	2014
Molybdenum, Total (ppb)	n/a	n/a	4.92	2.6 - 11.1	2014
Strontium, Total (ppb)	n/a	n/a	529	244 - 766	2014
Vanadium, Total (ppb)	50	n/a	2.69	1.4 - 5.2	2014

** There is currently no MCL for hexavalent chromium. The previous MCL of 10 ppb was withdrawn on September 11, 2017.

*** Total chromium is regulated with an MCL of 50 ppb but was not detected, based on the detection limit for purposes of reporting of 10 ppb. Total chromium was included as part of the unregulated chemicals requiring monitoring.



Courtesy of The Metropolitan Water District of Southern California

2017 Water Quality Table



2017 MWD TREATED SURFACE WATER

1 Constituents	2 MCL	2 PHG (MCLG)	3 Average Amount	4 Range of Detections	5 MCL Violation ?	6 Typical Source in Drinking Water
Inorganic Constituents - Tested in 2017						
Aluminum (ppm)	1	0.6	0.168	0.12 - 0.24	No	Treatment Process Residue, Natural Deposits
Fluoride (ppm) treatment-related	Control Range 0.6 - 1.2 ppm Optimal Level 0.7 ppm		0.7	0.6 - 0.9	No	Water Additive for Dental Health
Secondary Standards - Tested in 2017						
Aluminum (ppb)	200*	600	160	ND -130	No	Treatment Process Residue, Natural Deposits
Chloride (ppm)	500*	n/a	50	34 - 66	No	Runoff or Leaching from Natural Deposits
Color (color units)	15*	n/a	1	1	No	Naturally-occurring Organic Materials
Odor (threshold odor number)	3*	n/a	2	2	No	Naturally-occurring Organic Materials
Specific Conductance (umho/cm)	1,600*	n/a	490	351 - 630	No	Substances that Form Ions in Water
Sulfate (ppm)	500*	n/a	96	65 - 127	No	Runoff or Leaching from Natural Deposits
Total Dissolved Solids (ppm)	1,000*	n/a	294	213 - 374	No	Runoff or Leaching from Natural Deposits
Unregulated Constituents - Tested in 2017						
Alkalinity, total as CaCO ₃ (ppm)	Not Regulated	n/a	61	48 - 74	n/a	Runoff or Leaching from Natural Deposits
Boron (ppm)	NL=1	n/a	0.1	0.1	n/a	Runoff or Leaching from Natural Deposits
Calcium (ppm)	Not Regulated	n/a	28	20 - 36	n/a	Runoff or Leaching from Natural Deposits
Hardness, total as CaCO ₃ (ppm)	Not Regulated	n/a	119	82 - 156	n/a	Runoff or Leaching from Natural Deposits
Hardness, total (grains/gallon)	Not Regulated	n/a	7	4.8 - 9.1	n/a	Runoff or Leaching from Natural Deposits
Magnesium (ppm)	Not Regulated	n/a	12	8.1 - 16	n/a	Runoff or Leaching from Natural Deposits
pH (pH units)	Not Regulated	n/a	8.4	8.2 - 8.6	n/a	Hydrogen Ion Concentration
Potassium (ppm)	Not Regulated	n/a	2.8	2.4 - 3.2	n/a	Runoff or Leaching from Natural Deposits
Sodium (ppm)	Not Regulated	n/a	51	39 - 63	n/a	Runoff or Leaching from Natural Deposits
Total Organic Carbon (ppm)	TT	n/a	2.4	1.8 - 3.0	n/a	Various Natural and Man-made Sources
Turbidity - combined filter effluent⁴ Metropolitan Water District Diemer Filtration Plant						
		Treatment Technique	Turbidity Measurements		TT Violation?	Typical Source of Chemical
1) Highest single turbidity measurement		0.3 NTU	0.08		No	Soil Runoff
2) Percentage of samples less than 0.3 NTU		95%	100%		No	Soil Runoff

UNREGULATED CHEMICALS REQUIRING MONITORING

Constituents	Notification Level	PHG	Average Amount	Range of Detections	Most Recent Sampling Date
Chlorate (ppb)	800	n/a	53.3	38.1 - 67.6	2013
Chromium, Hexavalent (ppb)	n/a	0.02**	0.07	0.03 - 0.12	2013
Chromium, Total (ppb) ***	MCL = 50	MCLG = 100	<0.2	ND - 0.5	2014
Molybdenum, Total (ppb)	n/a	n/a	4.8	4.5 - 5.3	2014
Strontium, Total (ppb)	n/a	n/a	938	854 - 1,070	2014
Vanadium, Total (ppb)	50	n/a	2.8	2.3 - 3	2014

** There is currently no MCL for hexavalent chromium. The previous MCL of 10 ppb was withdrawn on September 11, 2017.

*** Total chromium is regulated with an MCL of 50 ppb but was not detected, based on the detection limit for purposes of reporting of 10 ppb. Total chromium was included as part of the unregulated chemicals requiring monitoring.



Notes



1. Trihalomethanes and Haloacetic

Acids: Eight locations in the distribution system are tested quarterly for total trihalomethanes and haloacetic acids. Fifty locations are tested monthly for color, odor and turbidity. Color was not detected in 2017.

2. Coliform:

No more than 5% of the monthly samples may be positive for total coliform bacteria. The occurrence of 2 consecutive total coliform positive samples, one of which contains fecal coliform/E.coli, constitutes an acute MCL violation. This Consumer Confidence Report (CCR) reflects changes in drinking water regulatory requirements during 2016. All water systems are required to comply with the state Total Coliform Rule. Effective April 1, 2016, all water systems are also required to comply with the federal Revised Total Coliform Rule. The new federal rule maintains the purpose to protect public health by ensuring the integrity of the drinking water distribution system and monitoring for the presence of microbials (i.e., total coliform and E. coli bacteria). The U.S. EPA anticipates greater public health protection as the new rule requires water systems that are vulnerable to microbial contamination to identify and fix problems. Water systems that exceed a specified frequency of total coliform occurrences are required to conduct an assessment to determine if any sanitary defects exist. If found, these must be corrected by the water system.

3. Lead and Copper.

In 2015, 80 residences were tested for lead and copper at-the-tap. Lead was not detected in any of the samples. Copper was detected in 66 samples, none of which exceeded the AL for copper. A regulatory action level is the concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow. In 2017, no school submitted request to be sampled for lead.

4. Combined Filter Effluent Turbidity (NTU).

Turbidity is a measure of the cloudiness of the water, an indication of particulate matter, some of which might include harmful microorganisms. Low turbidity in Metropolitan's treated water is a good indicator of effective filtration. Filtration is called a "treatment technique" (TT). A treatment technique is a required process intended to reduce the level of chemicals in drinking water that are difficult and sometimes impossible to measure directly.



Looking to the Future



His goals are strategic and long-term. His sights are set on a resilient future for Santa Ana.

Ask Nabil Saba how he views his role as Santa Ana's Water Resources Division Manager and his answer goes beyond just maintaining day-to-day operations. He actively champions long-term sustainability. That means looking at new technologies and projects to better manage water resources, improve customer service, curb water rate increases and help keep water available and affordable for generations to come.

In the next few years, he is focused on strengthening the reliability of Santa Ana's water infrastructure by replacing aging pipelines and upgrading and modernizing the water distribution and storage system. These capital improvement programs include drilling two new wells, upgrading the division's supervisory control and data acquisition system (SCADA), a \$3 million project, and replacing five miles of pipeline each year.

Upgrading to an Automated Meter Infrastructure (AMI) is another way he looks to reduce operational costs, improve service and prepare for the Santa Ana's future needs. He spearheaded this initiative and, after conducting a thorough study, the City received \$4 million in funding from the State of California to implement its first phase. A new special taskforce and project manager will oversee the process.

He advocated for Santa Ana's support of the California WaterFix, a \$17 billion project that will protect our state's water supplies from climate change through upgrades to the State Water Project and habitat

restoration in Northern California's Delta. It is the single most cost-effective, large-scale projects to ensure Orange County's long-term water supply.

"We won't see the benefits from this project until 20 years from now, but that's when we'll need it most. It will ensure a reliable water supply for our children's future," he explains.

At the same time, Santa Ana has supported the expansion of Orange County Water District's Groundwater Replenishment System (GWRS), which purifies wastewater before it is injected into our wetlands and groundwater basin, which supplies high quality water for 2.4 million residents in north and central Orange County. The GWRS expansion will reduce the region's dependency on imported water while protecting environmental habitats and natural resources.

"The decisions we make today will impact our long term sustainability and quality of life," he adds. "Santa Ana and other regional agencies have shown exceptional leadership in this regard. Together, we must all commit to a cooperative stewardship of our national resources and to put into place water-smart plans to mitigate the growing impact of climate change."

"The decisions we make today will impact our long term sustainability and quality of life."

Looking to the future, Nabil Saba envisions all water devices, systems and appliances will be more efficient, designed with smart controllers, and available to everyone. Storm water capture will become a way of the future with climate change and recycling water to replenish our groundwater will become a standard.



Safeguarding Our Ecosystem & Health



Conserving water is everyone's responsibility and so is protecting our watersheds and ocean from pollution.

Did you know that what you do in your kitchen can impact the health of our local ecosystem and pose health risks for you, your family and neighbors?

It is as simple as how you dispose of your waste after you cook.

When fatty waste from cooking is poured down the drain, it can solidify and block sewer lines, causing raw sewage to back up into your home, yard, streets and storm drains, eventually making its way into our storm water drain system, waterways, and the ocean.

The Tip of the Fatberg

Fats, oils and grease (FOG) do not break down in water, and even most soaps and other agents, like drain cleaner or detergent, can't dissolve grease effectively enough to keep the sewer system clear.



Ask the City of Baltimore. A massive clog of FOG and other waste that had accumulated in a sewer main near Baltimore's Penn Station was to blame for an overflow that dumped some 1.2 million gallons of sewage into the city's local watershed.

A much larger "fatberg" was also discovered in London, which was some 820 feet long, blocking a stretch of sewer more than twice the length of two soccer fields. According to experts, potentially infectious bacteria including listeria, campylobacter and E coli was found in the London fatberg. This not only poses an immediate risk to city workers cleaning out the sewers, but also to the public since it could backup the system and cause sewage to flood homes and businesses.

While there are no major fatbergs lurking under the streets of Santa Ana, FOG can block your home's pipes and wreak havoc.

Pan to the Can

Be sure to pour unused grease or oil from the pan into a nonrecyclable container (juice can, empty milk carton, coffee can, pet food can). Once it hardens, toss the container into the trash. If you're in a hurry, place the container into the freezer.

You can also do other things to keep your drains FOG-free, such as use a sink strainer to catch food items like bacon and fried chicken that contain FOG and can cause clogs and messy overflows.

You can visit our website and download a FOG FAQ (Frequently Asked Questions) in English and Spanish.

To Flush or Not To Flush

While not FOG, another major culprit to sewage blockages are "flushable" wipes. Wet wipes don't break down in water. So put them in the trash instead.

Is Your Drinking Water at Risk **YOU?** Because of



Water mains aren't the only way contaminants can get into your water supply. There are common cross-connection hazards you should know.

Your water supply enters your home at a certain pressure. On rare occasions, this pressure can be interrupted by a water main break, fire fighters using large quantities of water to extinguish a nearby blaze, or some other disruption in water service. When there is a significant loss of pressure, water can flow by suction back into the public water supply system. This is called "back-siphonage."

Likewise, when your home's water system creates a sudden pressure greater than Santa Ana's public water system, the same effect can occur where water is pushed back into the public water supply. This is called "backpressure" backflow. Without a working backflow preventer, water from a sink or bathtub or dirty irrigation line can easily be pulled back into the main lines.

One is pushing, one is pulling, but the effect is still the same: backflow.

Contamination occurs when a water supply line is connected to equipment containing a non-potable (unsafe to drink) substance. These "cross connections" are dangerous if no protective measures are taken.

Here are common cross connections, which, if improperly protected, can allow contaminants like chemicals, fertilizer, soapy water or even bacteria, back into your pipes and your drinking water supply:

- A hose is submerged in polluted or contaminated water.
- A secondary source of irrigation water (from a well or pond) is pumped into an irrigation system that is directly connected to the potable water supply system.

- A heating boiler with treatment chemical added to prevent internal corrosion is connected directly to the water supply for make-up-water.
- An underground lawn sprinkler system is directly connected to the water supply system.
- A fountain or swimming pool has a direct connection with the water system for filling.

As a homeowner, you are responsible for preventing contaminants from entering into your water system as well as the public water distribution system by properly installing and maintaining backflow prevention devices.

These devices are like seat belts: they protect you from a contamination event that may never occur. But, if it does, you'll be glad you were protected!

Please visit our website for more information and Cross Connection Control Resources: santa-ana.org/water/water-service/cross-connections-backflow/.

Commonly Used Residential Backflow Prevention Devices

Air Gap:

Used mainly on tanks and faucets, it is a gap between the pipe and the container.

Atmospheric Vacuum Breaker: It has an air inlet valve that will drop to draw in air thus preventing customer system water from entering Santa Ana's water mains.

Pressure Vacuum Breaker:

Used mainly on lawn irrigation systems. It has a one way check and a spring loaded air inlet valve that closes when the public water main pressure drops.





Santa Ana Receives Another Encore



Oops, we did it again! The City of Santa Ana earned another rare encore at the 28th annual Berkeley Springs International Water Tasting, the largest and longest running competition in the world dedicated to preserving and protecting drinking water.

It was the fourth encore Santa Ana has received at the competition—touted as the Academy Awards of Water—where the City grabbed the gold medal for producing the best tasting and highest quality tap water in the country. Santa Ana won the gold medal in 2014, after claiming the bronze and silver medals in 2011 and 2012.

“Winning the nation’s top award in our category is phenomenal. Winning the award four times attests to the high standards we set for our tap water and the dedication of our certified specialists who are committed to serving our customers,” says Nabil Saba, Water Resources Manager, City of Santa Ana.

Our Performance Continues

There had been some speculation that the City might win the award again. After all, Santa Ana’s Water Resources Division ensures that its drinking water exceeds health standards required by both state and federal agencies year after year.

While some may take the quality of their drinking water for granted, Santa Ana does not. Backstage, the Water Resources Division performs year-round monitoring, where over 11,000 samples

are collected at various sampling points throughout the City’s water system to ensure the community enjoys the highest quality tap water possible.

Residents can take pride knowing that the twelve judges at the Berkeley Springs International Water Tasting chose Santa Ana’s tap water over all other entries in the municipal water category. Similar to a wine tasting, they rated the water for each attribute including appearance (should be clear), aroma (should be none), taste (should taste clean), mouth feel (should feel light), and aftertaste (should leave people thirsty for more).

The next time you think about drinking bottled water, we invite you to turn on the tap and fill your glass. Who knows, you may feel inspired to offer a toast to the City for a job well done!



Upcoming Events



Free Water Wise Gardening Workshops

Santa Ana's Water Resources Division invites you to learn about water-wise gardening for your home. You'll learn everything you need to know about changing your lawn into a beautiful drought tolerant landscape:

- How to create healthy soil.
- The importance of mulch.
- Invasive weeds and ways to remove them.
- Picking a plant pallet that is suited for your climate & environment.

Our Saturday workshops will include fun gardening activities for children. Bring the entire family!

RSVP for the classes: (714) 647-3500



ORANGE COUNTY
COASTKEEPER



Courtesy of The California Department of Water Resources

June 30	9:30 am – 11:30 am	Makara Center, 811 N. Main Street
July 21	9:30 am – 11:30 am	Public Library, 26 Civic Center Plaza
August 16	7:00 pm – 8:30 pm	Santa Ana Senior Center, 424 W 3rd Street
September 22	9:30 am – 11:30 am	Public Library, 26 Civic Center Plaza



Be sure to reserve your spot
now!



2018 Youth Water Poster Contest

Overflows

With More Than 400 Entries

The City of Santa Ana congratulates all students and Santa Ana Unified School District teachers who participated this year!

The winners of our 2018 Youth Water Poster Contest nailed this year's theme with their creative prose. Students throughout the City of Santa Ana were invited to participate and create their posters using the theme, "Fill It From The Tap!" to illustrate why drinking tap water over bottled water is safer, more affordable, and better for the environment.

Many focused on the environmental impact of bottled water, showing how plastic bottles end up polluting our oceans and landfills, with one cleverly titling her poster "Refills Not Landfills." Some highlighted the cost of bottled water, an average 2,200 times higher than tap water.

Others emphasized the high quality of Santa Ana's water and how it is subject to stricter safety regulations than bottled water.

More than 400 entries were submitted by students ranging in ages 5 to 18. A special congratulations to the following grand prize winners and finalists, whose posters were on display at City Hall for six weeks:

Ages 5-8

- Nayeli Luis-Martinez**, 8, grand prize winner
- Johann Bay**, 7, finalist
- Christalyn Mascareñas**, 8, finalist

Ages 9-12

- Briana Moreno**, 9, grand prize winner
- Matthew Bay**, 10, finalist
- Sarai Santiago**, 9, finalist



2018 Youth Water Poster Contest Winners





Ages 13-14

Deborah Sanchez, 13, grand prize winner
Elena Arechiga, 13, finalist
Stephanie Lopez, 13, finalist

Ages 15-18

Alberto Rodriguez, 17, grand prize winner
Monica Rodriguez, 15, finalist
Julisa Julian, 16, finalist

Major Miguel A. Pulido and the entire Santa Ana City Council celebrated these students and their families at a special awards ceremony last February.

“We congratulate the 12 outstanding young artists who won this year’s contest for their creative accomplishments,” said Councilman Vicente Sarmiento who presented a certificate to each winner. “And we thank Tram Le, Arts & Culture Specialist for the City of Santa Ana, Elizabeth Cardenas from Art for Change, and Alicia Rodriguez, COO of the Delhi Center—who served as this year’s judges—for all their hard work!”

Councilman Sarmiento, who is activity involved in the community and an avid supporter of outreach programs like the annual Youth Water Poster Contest, joined the winners and their families for a special reception hosted by the Water Resources Division. Everyone enjoyed food and

refreshments, music, special presentations, and cameo shots with the councilman. Winners were awarded their prizes, ranging from gift certificates and Nintendo 3DS XLs to iPads. A special drawing for a \$200 gift certificate from Art Supply Warehouse was held for teachers who actively encouraged student participation in the contest.

“The contest is an important educational initiative for the City, offering parents and their children the opportunity to explore various water-related themes such as the health benefits of drinking water, water conservation and water quality,” added Nabil Saba, Water Resources Manager for the City of Santa Ana. “We’d like to especially acknowledge the Santa Ana Unified School District, which, for the past three years, has supported our annual Youth Water Poster Contest and helped make this important educational initiative a success!”

Call for entries for the 2019 Youth Water Poster Contest begins this fall. Don’t miss the opportunity to let your creativity shine! For more information about the contest, email conservewater@santa-ana.org or call (714) 647-3500.



Building Inspection Request Line

714-667-2738

City Manager
714-647-5200

Fire Department
714-573-6000
(call 911 for emergencies)

Mayor and City Council
714-647-6900

Parks & Recreation
714-571-4200

Planning & Building, Planning Division
(Environmental Review, Historic Preservation
& New Development)
714-667-2700

Police Department
714-245-8665
(call 911 for emergencies)

Public Library
714-647-5250

Public Works Emergency Repairs
(after hours)
714-834-4211

Public Works Information
714-647-5690

Maintenance Services

Curb & Sidewalks
714-647-3380

Graffiti Removal
877-786-7824

Graffiti Task Force
714-245-8769 (Police Department)

Public Works

General Maintenance and Repairs
714-647-3380

Sanitation
714-647-3309

Shopping Cart Removal
714-667-2780

Street Lights
714-647-3505

Street Sweeping
714-647-3309

Trees
714-647-3330

Weed Abatement
714-647-3309



Useful Telephone Numbers



Water Resources

Sewer/Storm Drain Maintenance
714-647-3380

Water Administration
714-647-3320

Water & Sewer Permits
714-647-5026

Water Customer Service and Billing
714-647-5454

Water Engineering
714-647-3320

Water Maintenance & Construction
714-647-3346

Water Production
714-647-3382

Water Quality & Conservation
714-647-3320

Water Service & Main Location
714-647-3320

Refuse Collection

New Trash Cart/Order Dumpster
714-558-7761

Recycle Used Car Oil & Filter
714-558-7761

Traffic and Transportation

Signal Repairs - 8 a.m.-5 p.m. (Weekdays)
714-647-5620

Signal Repairs - Police Department
(Evenings/Weekends)
714-834-4211

Street Work Permits
714-647-5039

Traffic Operations
714-647-5619

Other Helpful Numbers

Bus Information
714-636-7433

Noise Complaints
714-834-4211

Overcrowding
714-667-2780

Poison Center
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You can request a copy of the most recent summary of the Watershed Sanitary Surveys and the Source Water Assessment by calling MWD at 213-217-6000.

For a copy of the complete assessments for Santa Ana's distribution system and groundwater, call the Santa Ana Water Resources Division at 714-647-3320.

If you have questions about your water quality, contact:

City of Santa Ana, Water Resources Division

Nabil Saba P.E. Water Resources Manager

Cesar Barrera P.E. Principal Civil Engineer

Robert Hernandez Acting Water Services Quality Coordinator

220 South Daisy Avenue

Bldg A, Santa Ana, California 92703

phone: 714-647-3320 | fax: 714-647-3345

web: santaanaccr.org



Este informe contiene información muy importante sobre su agua potable.
Tradúzcalo o hable con alguien que lo entienda bien.

Chi tiet này thật quan trọng.
Xin nhờ người dịch cho quý vị.

Daimntawv tshaj tawm no muaj lus tseemceeb txog koj cov dej haus.
Tshab txhais nws, los yog tham nrog tej tug neeg uas totaub txog nws.

此份有关你的食水报告, 内有重要资料和信息, 请找
他人为你翻译及解释清楚。

Mahalaga ang impormasyong ito. Mangyaring ipasalin ito.

APPENDIX: B

NOTE: This publication is meant to be an aid to the staff of the CDPH—formerly the Department of Health Services (DHS)—Drinking Water Program and cannot be relied upon by the regulated community as the State of California’s representation of the law. The published codes are the only official representation of the law. Refer to the published codes—in this case, Title 17 and 22 CCR—whenever specific citations are required.

California Department of Public Health

Regulations Related to Recycled Water **June 18, 2014 (Revisions effective on 6/18/14)**

Sections amended, adopted, repealed, or not included in the previous version are highlighted in yellow. If the text in a section, subsection, or paragraph is highlighted, it is new. If only the section/paragraph number is highlighted, it was amended or repealed. Nonsubstantive revisions may not be shown.

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TITLE 17 CODE OF REGULATIONS

Division 1. State Department of Health Services

Chapter 5. Sanitation (Environmental)

Group 4. Drinking Water Supplies

Article 1. General.

§7583. Definitions.

In addition to the definitions in Section 4010.1 of the Health and Safety Code, the following terms are defined for the purpose of this Chapter:

(a) "Approved Water Supply" is a water supply whose potability is regulated by a State of local health agency.

(b) "Auxiliary Water Supply" is any water supply other than that received from a public water system.

(c) "Air-gap Separation (AG)" is a physical break between the supply line and a receiving vessel.

(d) "AWWA Standard" is an official standard developed and approved by the American Water Works Association (AWWA).

(e) "Cross-Connection" is an unprotected actual or potential connection between a potable water system used to supply water for drinking purposes and any source or system containing unapproved water or a substance that is not or cannot be approved as safe, wholesome, and potable. By-pass arrangements, jumper connections, removable sections, swivel or changeover devices, or other devices through which backflow could occur, shall be considered to be cross-connections.

(f) "Double Check Valve Assembly (DC)" is an assembly of at least two independently acting check valves including tightly closing shut-off valves on each side of the check valve assembly and test cocks available for testing the watertightness of each check valve.

(g) "Health Agency" means the California Department of Health Services, or the local health officer with respect to a small water system.

(h) "Local Health Agency" means the county or city health authority.

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(i) "Reclaimed Water" is a wastewater which as a result of treatment is suitable for uses other than potable use.

(j) "Reduced Pressure Principle Backflow Prevention Device (RP)" is a backflow preventer incorporating not less than two check valves, an automatically operated differential relief valve located between the two check valves, a tightly closing shut-off valve on each side of the check valve assembly, and equipped with necessary test cocks for testing.

(k) "User Connection" is the point of connection of a user's piping to the water supplier's facilities.

(l) "Water Supplier" is the person who owns or operates the public water system.

(m) "Water User" is any person obtaining water from a public water supply.

§7584. Responsibility and scope of program.

The water supplier shall protect the public water supply from contamination by implementation of a cross-connection control program. The program, or any portion thereof, may be implemented directly by the water supplier or by means of a contract with the local health agency, or with another agency approved by the health agency. The water supplier's cross-connection control program shall for the purpose of addressing the requirements of Sections 7585 through 7605 include, but not be limited to, the following elements:

(a) The adoption of operating rules or ordinances to implement the cross-connection program.

(b) The conducting of surveys to identify water user premises where cross-connections are likely to occur,

(c) The provisions of backflow protection by the water user at the user's connection or within the user's premises or both,

(d) The provision of at least one person trained in cross-connection control to carry out the cross-connection program,

(e) The establishment of a procedure or system for testing backflow preventers, and

(f) The maintenance of records of locations, tests, and repairs of backflow preventers.

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§7585. Evaluation of hazard.

The water supplier shall evaluate the degree of potential health hazard to the public water supply which may be created as a result of conditions existing on a user's premises. The water supplier, however, shall not be responsible for abatement of cross-connections which may exist within a user's premises. As a minimum, the evaluation should consider: the existence of cross-connections, the nature of materials handled on the property, the probability of a backflow occurring, the degree of piping system complexity and the potential for piping system modification. Special consideration shall be given to the premises of the following types of water users:

- (a) Premises where substances harmful to health are handled under pressure in a manner which could permit their entry into the public water system. This includes chemical or biological process waters and water from public water supplies which have deteriorated in sanitary quality.

- (b) Premises having an auxiliary water supply, unless the auxiliary supply is accepted as an additional source by the water supplier and is approved by the health agency.

- (c) Premises that have internal cross-connections that are not abated to the satisfaction of the water supplier or the health agency.

- (d) Premises where cross-connections are likely to occur and entry is restricted so that cross-connection inspections cannot be made with sufficient frequency or at sufficiently short notice to assure that cross-connections do not exist.

- (e) Premises having a repeated history of cross-connections being established or re-established.

§7586. User supervisor.

The health agency and water supplier may, at their discretion, require an industrial water user to designate a user supervisor when the water user's premises has a multipiping system that convey various types of fluids, some of which may be hazardous and where changes in the piping system are frequently made. The user supervisor shall be responsible for the avoidance of cross-connections during the installation, operation and maintenance of the water user's pipelines and equipment.

Article 2. Protection of Water System.

§7601. Approval of backflow preventers.

Backflow preventers required by this Chapter shall have passed laboratory and field evaluation tests performed by a recognized testing organization which has demonstrated their competency to perform such tests to the Department.

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§7602. Construction of backflow preventers.

(a) Air-gap Separation. An Air-gap separation (AG) shall be at least double the diameter of the supply pipe, measured vertically from the flood rim of the receiving vessel to the supply pipe; however, in no case shall this separation be less than one inch.

(b) Double Check Valve Assembly. A required double check valve assembly (DC) shall, as a minimum, conform to the AWWA Standard C506-78 (R83) adopted on January 28, 1978 for Double Check Valve Type Backflow Preventive Devices which is herein incorporated by reference.

(c) Reduced Pressure Principle Backflow Prevention Device. A required reduced pressure principle backflow prevention device (RP) shall, as a minimum, conform to the AWWA Standard C506-78 (R83) adopted on January 28, 1978 for Reduced Pressure Principle Type Backflow Prevention Devices which is herein incorporated by reference.

§7603. Location of backflow preventers.

(a) Air-gap Separation. An air-gap separation shall be located as close as practical to the user's connection and all piping between the user's connection and the receiving tank shall be entirely visible unless otherwise approved in writing by the water supplier and the health agency.

(b) Double Check Valve Assembly. A double check valve assembly shall be located as close as practical to the user's connection and shall be installed above grade, if possible, and in a manner where it is readily accessible for testing and maintenance.

(c) Reduced Pressure Principle Backflow Prevention Device. A reduced pressure principle backflow prevention device shall be located as close as practical to the user's connection and shall be installed a minimum of twelve inches (12") above grade and not more than thirty-six inches (36") above grade measured from the bottom of the device and with a minimum of twelve inches (12") side clearance.

§7604. Type of protection required.

The type of protection that shall be provided to prevent backflow into the public water supply shall be commensurate with the degree of hazard that exists on the consumer's premises. The type of protective device that may be required (listed in an increasing level of protection) includes: Double check Valve Assembly--(DC), Reduced Pressure Principle Backflow Prevention Device--(RP) and an Air gap Separation--(AG). The water user may choose a higher level of protection than required by the water supplier. The minimum types of backflow protection required to protect the public water supply, at the water user's connection to premises with various degrees of hazard, are given in Table 1. Situations not covered in Table 1 shall be evaluated on a case-by-case basis and the

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appropriate backflow protection shall be determined by the water supplier or health agency.

TABLE 1
TYPE OF BACKFLOW PROTECTION REQUIRED

Degree of Hazard	Minimum Type of Backflow Prevention
(a) Sewage and Hazardous Substances	
(1) Premises where there are waste water pumping and/or treatment plants and there is no interconnection with the potable water system. This does not include a single-family residence that has a sewage lift pump. A RP be provided in lieu of an AG if approved by the health agency and water supplier.	AG
(2) Premises where hazardous substances are handled in any manner in which the substances may enter the potable water system. This does not include a single-family residence that has a sewage lift pump. A RP may be provided in lieu of an AG if approved by the health agency and water supplier.	AG
(3) Premises where there are irrigation systems into which fertilizers, herbicides, or pesticides are, or can be, injected.	RP
(b) Auxiliary Water Supplies	
(1) Premises where there is an unapproved auxiliary water supply which is interconnected with the public water system. A RP or DC may be provided in lieu of an AG if approved by the health agency and water supplier	AG
(2) Premises where there is an unapproved auxiliary RP water supply and there are no interconnections with the public water system. A DC may be provided in lieu of a RP if approved by the health agency and water supplier.	RP
(c) Recycled water	
(1) Premises where the public water system is used to supplement the recycled water supply.	AG
(2) Premises where recycled water is used, other than as allowed in paragraph (3), and there is no interconnection with the potable water system.	RP
(3) 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 of the	DC

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local public water supplier, or the Department if the water supplier is also the supplier of the recycled water, to utilize an alternative backflow protection plan that includes an annual inspection and annual shutdown test of the recycled water and potable water systems pursuant to subsection 60316(a).

(d) Fire Protection Systems

(1) Premises where the fire system is directly supplied from the public water system and there is an unapproved auxiliary water supply on or to the premises (not interconnected). DC

(2) Premises where the fire system is supplied from the public water system and interconnected with an unapproved auxiliary water supply. A RP may be provided in lieu of an AG if approved by the health agency and water supplier. AG

(3) Premises where the fire system is supplied from the public water system and where either elevated storage tanks or fire pumps which take suction from private reservoirs or tanks are used. DC

(4) Premises where the fire system is supplied from the public water system and where recycled water is used in a separate piping system within the same building. DC

(e) Dockside Watering Points and Marine Facilities

(1) Pier hydrants for supplying water to vessels for any purpose. RP

(2) Premises where there are marine facilities. RP

(f) Premises where entry is restricted so that inspections for cross-connections cannot be made with sufficient frequency or at sufficiently short notice to assure that do not exist. RP

(g) Premises where there is a repeated history of crossconnections being established or re-established. RP

§7605. Testing and maintenance of backflow preventers.

(a) The water supplier shall assure that adequate maintenance and periodic testing are provided by the water user to ensure their proper operation.

(b) Backflow preventers shall be tested by persons who have demonstrated their competency in testing of these devices to the water supplier or health agency.

(c) Backflow preventers shall be tested at least annually or more frequently if determined to be necessary by the health agency or water supplier. When devices are

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found to be defective, they shall be repaired or replaced in accordance with the provisions of this Chapter.

(d) Backflow preventers shall be tested immediately after they are installed, relocated or repaired and not placed in service unless they are functioning as required.

(e) The water supplier shall notify the water user when testing of backflow preventers is needed. The notice shall contain the date when the test must be completed.

(f) Reports of testing and maintenance shall be maintained by the water supplier for a minimum of three years.

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TITLE 22 CODE OF REGULATIONS

Division 4. Environmental Health

Chapter 1. Introduction

Article 1. Definitions

§60001. Department.

Whenever the term "department" is used in this division, it means the State Department of Health Services, unless otherwise specified.

§60003. Director.

Whenever the term "director" is used in this division, it means the Director, State Department of Health Services, unless otherwise specified.

Chapter 2. Regulations for the Implementation of the California Environmental Quality

Article 1. General Requirements and Categorical Exemptions

§60100. General requirements.

The Department of Health Services incorporates by reference the objectives, criteria, and procedures as delineated in Chapters 1, 2, 2.5, 2.6, 3, 4, 5, and 6, Division 13, Public Resources Code, Sections 21000 et seq., and the Guidelines for the Implementation of the California Environmental Quality Act, Title 14, Division 6, Chapter 3, California Administrative Code, Sections 15000 et seq.

§60101. Specific activities within categorical exempt classes.

The following specific activities are determined by the Department to fall within the classes of categorical exemptions set forth in Sections 15300 et seq. of Title 14 of the California Administrative Code:

(a) Class 1: Existing Facilities.

(1) Any interior or exterior alteration of water treatment units, water supply systems, and pump station buildings where the alteration involves the addition, deletion, or modification of mechanical, electrical, or hydraulic controls.

(2) Maintenance, repair, replacement, or reconstruction to any water treatment process units, including structures, filters, pumps, and chlorinators.

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(b) Class 2: Replacement or Reconstruction.

(1) Repair or replacement of any water service connections, meters, and valves for backflow prevention, air release, pressure regulating, shut-off and blow-off or flushing.

(2) Replacement or reconstruction of any existing water supply distribution lines, storage tanks and reservoirs of substantially the same size.

(3) Replacement or reconstruction of any water wells, pump stations and related appurtenances.

(c) Class 3: New Construction of Small Structures.

(1) Construction of any water supply and distribution lines of less than sixteen inches in diameter, and related appurtenances.

(2) Construction of any water storage tanks and reservoirs of less than 100,000 gallon capacity.

(d) Class 4: Minor Alterations to Land.

(1) Minor alterations to land, water, or vegetation on any officially existing designated wildlife management areas or fish production facilities for the purpose of reducing the environmental potential for nuisances or vector production.

(2) Any minor alterations to highway crossings for water supply and distribution lines.

Chapter 3. Water Recycling Criteria

Article 1. Definitions.

§60301.050. 24-hour Composite Sample.

“24-hour Composite Sample” means an aggregate sample derived from no fewer than eight discrete samples collected at equal time intervals or collected proportional to the flow rate over the compositing period. The aggregate sample shall reflect the average source water quality covering the composite 24-hour sample period.

§60301.080. Added Tracer.

“Added Tracer” means a non-reactive substance, with measureable characteristics distinctly different from the receiving groundwater, intentionally added to the water applied at a Groundwater Replenishment Reuse Project (GRRP) for the purpose of being a tracer such that the tracer can be readily identified in the groundwater downgradient of the GRRP to determine the underground retention time of the applied water.

§60301.100. Approved laboratory.

"Approved laboratory" means a laboratory that has been certified by the Department to perform microbiological analyses pursuant to section 116390, Health and Safety Code.

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§60301.160. Coagulated wastewater.

"Coagulated wastewater" means oxidized wastewater in which colloidal and finely divided suspended matter have been destabilized and agglomerated upstream from a filter by the addition of suitable floc-forming chemicals.

§60301.170. Conventional treatment.

"Conventional treatment" means a treatment chain that utilizes a sedimentation unit process between the coagulation and filtration processes and produces an effluent that meets the definition for disinfected tertiary recycled water.

§60301.180. Department.

"Department" means the California Department of Public Health or its successor with authority to regulate public water systems.

§60301.190. Diluent Water.

"Diluent Water" means water, meeting the diluent requirements of this Chapter, used for reducing the recycled municipal wastewater contribution over time.

§60301.200. Direct beneficial use.

"Direct beneficial use" means the use of recycled water that has been transported from the point of treatment or production to the point of use without an intervening discharge to waters of the State.

§60301.220. Disinfected secondary-2.2 recycled water.

"Disinfected secondary-2.2 recycled water" means recycled water that has been oxidized and disinfected so that the median concentration of total coliform bacteria in the disinfected effluent does not exceed a most probable number (MPN) of 2.2 per 100 milliliters 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 milliliters in more than one sample in any 30 day period.

§60301.225. Disinfected secondary-23 recycled water.

"Disinfected secondary-23 recycled water" means recycled water that has been oxidized and disinfected so that the median concentration of total coliform bacteria in the disinfected effluent does not exceed a most probable number (MPN) of 23 per 100 milliliters 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 240 per 100 milliliters in more than one sample in any 30 day period.

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§60301.230. Disinfected tertiary recycled water.

"Disinfected tertiary recycled water" means a filtered and subsequently disinfected wastewater that meets the following criteria:

(a) The filtered wastewater has been disinfected by either:

(1) 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

(2) 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 in the wastewater. A virus that is at least as resistant to disinfection as polio virus may be used for purposes of the demonstration.

(b) The median concentration of total coliform bacteria measured in the disinfected effluent does not exceed an MPN of 2.2 per 100 milliliters 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 milliliters in more than one sample in any 30 day period. No sample shall exceed an MPN of 240 total coliform bacteria per 100 milliliters.

§60301.240. Drift.

"Drift" means the water that escapes to the atmosphere as water droplets from a cooling system.

§60301.245. Drift eliminator.

"Drift eliminator" means a feature of a cooling system that reduces to a minimum the generation of drift from the system.

§60301.250. Dual plumbed system.

"Dual plumbed system" or "dual plumbed" means a system that utilizes separate piping systems for recycled water and potable water within a facility and where the recycled water is used for either of the following purposes:

(a) To serve plumbing outlets (excluding fire suppression systems) within a building or

(b) Outdoor landscape irrigation at individual residences.

§60301.300. F-Specific bacteriophage MS-2.

"F-specific bacteriophage MS-2" means a strain of a specific type of virus that infects coliform bacteria that is traceable to the American Type Culture Collection (ATCC15597B1) and is grown on lawns of E. coli (ATCC 15597).

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§60301.310. Facility.

"Facility" means any type of building or structure, or a defined area of specific use that receives water for domestic use from a public water system as defined in section 116275 of the Health and Safety Code.

§60301.320. Filtered wastewater.

"Filtered wastewater" means an oxidized wastewater that meets the criteria in subsection (a) or (b):

(a) Has been coagulated and passed through natural undisturbed soils or a bed of filter media pursuant to the following:

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

(2) So that the turbidity of the filtered wastewater does not exceed any of the following:

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

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

(C) 10 NTU at any time.

(b) Has been passed through a microfiltration, ultrafiltration, nanofiltration, or reverse osmosis membrane so that the turbidity of the filtered wastewater does not exceed any of the following:

(1) 0.2 NTU more than 5 percent of the time within a 24-hour period; and

(2) 0.5 NTU at any time.

§60301.330. Food crops.

"Food crops" means any crops intended for human consumption.

§60301.370. Groundwater.

"Groundwater" means water below the land surface in a saturated zone.

§60301.390. Groundwater Replenishment Reuse Project or GRRP.

"Groundwater Replenishment Reuse Project" or "GRRP" means 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 [as defined in Water Code section 13050(j)] for use as a source of municipal and domestic water supply.

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§60301.400. Hose bibb.

"Hose bibb" means a faucet or similar device to which a common garden hose can be readily attached.

§60301.450. Indicator Compound.

“Indicator Compound” means 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; is present in concentrations that provide information relative to the environmental fate and transport of those chemicals; may be used to monitor the efficiency of trace organic compounds removal by treatment processes; and provides an indication of treatment process failure.

§60301.455. Intrinsic Tracer.

“Intrinsic Tracer” means a substance or attribute present in the recharge water at levels different from the receiving groundwater such that the substance in the water applied at the GRRP can be distinctly and sufficiently detected in the groundwater downgradient of the GRRP to determine the underground retention time of the water.

§60301.550. Landscape impoundment.

"Landscape impoundment" means an impoundment in which recycled water is stored or used for aesthetic enjoyment or landscape irrigation, or which otherwise serves a similar function and is not intended to include public contact.

§60301.575. Maximum Contaminant Level or MCL.

“Maximum Contaminant Level” or “MCL” means the maximum permissible concentration of a contaminant established pursuant to sections 116275(c)(1) and (d) of the Health and Safety Code or established by the U.S. Environmental Protection Agency.

§60301.600. Modal contact time.

"Modal contact time" means the amount of time elapsed between the time that a tracer, such as salt or dye, is injected into the influent at the entrance to a chamber and the time that the highest concentration of the tracer is observed in the effluent from the chamber.

§60301.620. Nonrestricted recreational impoundment.

"Nonrestricted recreational impoundment" means an impoundment of recycled water, in which no limitations are imposed on body-contact water recreational activities.

§60301.625. Notification Level or NL.

“Notification Level” or “NL” means the concentration of a contaminant established by the Department pursuant to section 116455 of the Health and Safety Code.

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§60301.630. NTU.

"NTU" (Nephelometric turbidity unit) means a measurement of turbidity as determined by the ratio of the intensity of light scattered by the sample to the intensity of incident light as measured by method 2130 B. in Standard Methods for the Examination of Water and Wastewater, 20th ed.; Eaton, A. D., Clesceri, L. S., and Greenberg, A. E., Eds; American Public Health Association: Washington, DC, 1995; p. 2-8.

§60301.650. Oxidized wastewater.

"Oxidized wastewater" means wastewater in which the organic matter has been stabilized, is nonputrescible, and contains dissolved oxygen.

§60301.660. Peak dry weather design flow.

"Peak Dry Weather Design Flow" means the arithmetic mean of the maximum peak flow rates sustained over some period of time (for example three hours) during the maximum 24-hour dry weather period. Dry weather period is defined as periods of little or no rainfall.

§60301.670. Project Sponsor.

"Project Sponsor" means an entity subject to a Regional Water Quality Control Board’s (Regional Board’s) water recycling requirements for a Groundwater Replenishment Reuse Project (GRRP) and is, in whole or part, responsible for applying to the Regional Board for a permit, obtaining a permit, operation of a GRRP, and complying with the terms and conditions of the permit and the requirements of this Chapter.

§60301.680. Public Water System.

"Public Water System" has the same meaning as defined in section 116275(h) of the Health and Safety Code.

§60301.685. Recharge Water.

"Recharge Water" means recycled municipal wastewater, or the combination of recycled municipal wastewater and credited diluent water, which is utilized by a GRRP for groundwater replenishment.

§60301.690. Recycled Municipal Wastewater.

"Recycled Municipal Wastewater" means recycled water that is the effluent from the treatment of wastewater of municipal origin.

§60301.700. Recycled water agency.

"Recycled water agency" means the public water system, or a publicly or privately owned or operated recycled water system, that delivers or proposes to deliver recycled water to a facility.

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§60301.705. Recycled Municipal Wastewater Contribution or RWC.

“Recycled Municipal Wastewater Contribution” or “RWC” means the fraction equal to the quantity of recycled municipal wastewater applied at the GRRP divided by the sum of the quantity of recycled municipal wastewater and credited diluent water.

§60301.710. Recycling plant.

"Recycling plant" means an arrangement of devices, structures, equipment, processes and controls which produce recycled water.

§60301.740. Regulatory agency.

"Regulatory agency" means the California Regional Water Quality Control Board(s) that have jurisdiction over the recycling plant and use areas.

§60301.750. Restricted access golf course.

"Restricted access golf course" means a golf course where public access is controlled so that areas irrigated with recycled water cannot be used as if they were part of a park, playground, or school yard and where irrigation is conducted only in areas and during periods when the golf course is not being used by golfers.

§60301.760. Restricted recreational impoundment.

"Restricted recreational impoundment" means an impoundment of recycled water in which recreation is limited to fishing, boating, and other non-body-contact water recreational activities.

§60301.770. Regional Board.

“Regional Board” means the Regional Water Quality Control Board.

§60301.780. Saturated Zone.

“Saturated Zone” means an underground region or regions in which all interstices in, between, and below natural geologic materials are filled with water, with the uppermost surface of the saturated zone being the water table.

§60301.800. Spray irrigation.

"Spray irrigation" means the application of recycled water to crops to maintain vegetation or support growth of vegetation by applying it from sprinklers.

§60301.810. Spreading Area.

“Spreading Area” means a natural or constructed impoundment with a depth equal to or less than its widest surface dimension used by a GRRP to replenish a groundwater basin with recharge water infiltrating and percolating through a zone that, in the absence of a GRRP, would be an unsaturated zone.

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§60301.830. Standby unit process.

"Standby unit process" means an alternate unit process or an equivalent alternative process which is maintained in operable condition and which is capable of providing comparable treatment of the actual flow through the unit for which it is a substitute.

§60301.840. Subsurface Application.

"Subsurface Application" means the application of recharge water to a groundwater basin(s) by a means other than surface application.

§60301.850. Surface Application.

"Surface Application" means the application of recharge water to a spreading area.

§60301.855. Surrogate Parameter.

"Surrogate Parameter" means 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 trace organic compounds removal by a treatment process, and/or provides an indication of a treatment process failure.

§60301.860. Total Nitrogen.

"Total Nitrogen" means the sum of concentrations of ammonia, nitrite, nitrate, and organic nitrogen-containing compounds, expressed as nitrogen.

§60301.870. Total Organic Carbon or TOC.

"Total Organic Carbon" or "TOC" means the concentration of organic carbon present in water.

§60301.900. Undisinfected secondary recycled water.

"Undisinfected secondary recycled water" means oxidized wastewater.

§60301.910. Unsaturated Zone.

"Unsaturated Zone" means the volume between the land surface and the uppermost saturated zone.

§60301.920. Use area.

"Use area" means an area of recycled water use with defined boundaries. A use area may contain one or more facilities.

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Article 2. Sources of Recycled Water.

§60302. Source specifications.

The requirements in this chapter shall only apply to recycled water from sources that contain domestic waste, in whole or in part.

Article 3. Uses of Recycled Water.

§60303. Exceptions.

The requirements set forth in this chapter shall not apply to the use of recycled water onsite at a water recycling plant, or wastewater treatment plant, provided access by the public to the area of onsite recycled water use is restricted.

§60304. Use of recycled water for irrigation.

(a) Recycled water used for the surface irrigation of the following shall be a disinfected tertiary recycled water, except that for filtration pursuant to Section 60301.320(a) coagulation need not be used as part of the treatment process provided that the filter effluent turbidity does not exceed 2 NTU, the turbidity of the influent to the filters is continuously measured, the influent turbidity does not exceed 5 NTU for more than 15 minutes and never exceeds 10 NTU, and that there is the capability to automatically activate chemical addition or divert the wastewater should the filter influent turbidity exceed 5 NTU for more than 15 minutes:

- (1) Food crops, including all edible root crops, where the recycled water comes into contact with the edible portion of the crop,
- (2) Parks and playgrounds,
- (3) School yards,
- (4) Residential landscaping,
- (5) Unrestricted access golf courses, and
- (6) Any other irrigation use not specified in this section and not prohibited by other sections of the California Code of Regulations.

(b) Recycled water used for the surface irrigation of food crops where the edible portion is produced above ground and not contacted by the recycled water shall be at least disinfected secondary-2.2 recycled water.

(c) Recycled water used for the surface irrigation of the following shall be at least disinfected secondary-23 recycled water:

- (1) Cemeteries,
- (2) Freeway landscaping,
- (3) Restricted access golf courses,

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(4) Ornamental nursery stock and sod farms where access by the general public is not restricted,

(5) Pasture for animals producing milk for human consumption, and

(6) Any nonedible vegetation where access is controlled so that the irrigated area cannot be used as if it were part of a park, playground or school yard

(d) Recycled wastewater used for the surface irrigation of the following shall be at least undisinfected secondary recycled water:

(1) Orchards where the recycled water does not come into contact with the edible portion of the crop,

(2) Vineyards where the recycled water does not come into contact with the edible portion of the crop,

(3) Non food-bearing trees (Christmas tree farms are included in this category provided no irrigation with recycled water occurs for a period of 14 days prior to harvesting or allowing access by the general public),

(4) Fodder and fiber crops and pasture for animals not producing milk for human consumption,

(5) Seed crops not eaten by humans,

(6) Food crops that must undergo commercial pathogen-destroying processing before being consumed by humans, and

(7) Ornamental nursery stock and sod farms provided no irrigation with recycled water occurs for a period of 14 days prior to harvesting, retail sale, or allowing access by the general public.

(e) No recycled water used for irrigation, or soil that has been irrigated with recycled water, shall come into contact with the edible portion of food crops eaten raw by humans unless the recycled water complies with subsection (a).

§60305. Use of recycled water for impoundments.

(a) Except as provided in subsection (b), recycled water used as a source of water supply for nonrestricted recreational impoundments shall be disinfected tertiary recycled water that has been subjected to conventional treatment.

(b) Disinfected tertiary recycled water that has not received conventional treatment may be used for nonrestricted recreational impoundments provided the recycled water is monitored for the presence of pathogenic organisms in accordance with the following:

(1) During the first 12 months of operation and use the recycled water shall be sampled and analyzed monthly for *Giardia*, enteric viruses, and *Cryptosporidium*. Following the first 12 months of use, the recycled water shall be sampled and analyzed quarterly for *Giardia*, enteric viruses, and *Cryptosporidium*. The ongoing monitoring may be discontinued after the first two years of operation with the approval of the

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department. This monitoring shall be in addition to the monitoring set forth in section 60321.

(2) The samples shall be taken at a point following disinfection and prior to the point where the recycled water enters the use impoundment. The samples shall be analyzed by an approved laboratory and the results submitted quarterly to the regulatory agency.

(c) The total coliform bacteria concentrations in recycled water used for nonrestricted recreational impoundments, measured at a point between the disinfection process and the point of entry to the use impoundment, shall comply with the criteria specified in section 60301.230 (b) for disinfected tertiary recycled water.

(d) Recycled water used as a source of supply for restricted recreational impoundments and for any publicly accessible impoundments at fish hatcheries shall be at least disinfected secondary-2.2 recycled water.

(e) Recycled water used as a source of supply for landscape impoundments that do not utilize decorative fountains shall be at least disinfected secondary-23 recycled water.

§60306. Use of recycled water for cooling.

(a) Recycled water used for industrial or commercial cooling or air conditioning that involves the use of a cooling tower, evaporative condenser, spraying or any mechanism that creates a mist shall be a disinfected tertiary recycled water.

(b) Use of recycled water for industrial or commercial cooling or air conditioning that does not involve the use of a cooling tower, evaporative condenser, spraying, or any mechanism that creates a mist shall be at least disinfected secondary-23 recycled water.

(c) Whenever a cooling system, using recycled water in conjunction with an air conditioning facility, utilizes a cooling tower or otherwise creates a mist that could come into contact with employees or members of the public, the cooling system shall comply with the following:

(1) A drift eliminator shall be used whenever the cooling system is in operation.

(2) A chlorine, or other, biocide shall be used to treat the cooling system recirculating water to minimize the growth of *Legionella* and other microorganisms.

§60307. Use of recycled water for other purposes.

(a) Recycled water used for the following shall be disinfected tertiary recycled water, except that for filtration being provided pursuant to Section 60301.320(a) coagulation need not be used as part of the treatment process provided that the filter effluent turbidity does not exceed 2 NTU, the turbidity of the influent to the filters is continuously measured, the influent turbidity does not exceed 5 NTU for more than 15 minutes and

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never exceeds 10 NTU, and that there is the capability to automatically activate chemical addition or divert the wastewater should the filter influent turbidity exceed 5 NTU for more than 15 minutes:

- (1) Flushing toilets and urinals,
- (2) Priming drain traps,
- (3) Industrial process water that may come into contact with workers,
- (4) Structural fire fighting,
- (5) Decorative fountains,
- (6) Commercial laundries,
- (7) Consolidation of backfill around potable water pipelines,
- (8) Artificial snow making for commercial outdoor use, and
- (9) Commercial car washes, including hand washes if the recycled water is not heated, where the general public is excluded from the washing process.

(b) Recycled water used for the following uses shall be at least disinfected secondary-23 recycled water:

- (1) Industrial boiler feed,
- (2) Nonstructural fire fighting,
- (3) Backfill consolidation around nonpotable piping,
- (4) Soil compaction,
- (5) Mixing concrete,
- (6) Dust control on roads and streets,
- (7) Cleaning roads, sidewalks and outdoor work areas and
- (8) Industrial process water that will not come into contact with workers.

(c) Recycled water used for flushing sanitary sewers shall be at least undisinfected secondary recycled water.

Article 4. Use Area Requirements.

§60310. Use area requirements.

(a) No irrigation with disinfected tertiary recycled water shall take place within 50 feet of any domestic water supply well unless all of the following conditions have been met:

- (1) A geological investigation demonstrates that an aquitard exists at the well between the uppermost aquifer being drawn from and the ground surface.
- (2) The well contains an annular seal that extends from the surface into the aquitard.
- (3) The well is housed to prevent any recycled water spray from coming into contact with the wellhead facilities.

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(4) The ground surface immediately around the wellhead is contoured to allow surface water to drain away from the well.

(5) The owner of the well approves of the elimination of the buffer zone requirement.

(b) No impoundment of disinfected tertiary recycled water shall occur within 100 feet of any domestic water supply well.

(c) No irrigation with, or impoundment of, disinfected secondary-2.2 or disinfected secondary-23 recycled water shall take place within 100 feet of any domestic water supply well.

(d) No irrigation with, or impoundment of, undisinfected secondary recycled water shall take place within 150 feet of any domestic water supply well.

(e) Any use of recycled water shall comply with the following:

(1) Any irrigation runoff shall be confined to the recycled water use area, unless the runoff does not pose a public health threat and is authorized by the regulatory agency.

(2) Spray, mist, or runoff shall not enter dwellings, designated outdoor eating areas, or food handling facilities.

(3) Drinking water fountains shall be protected against contact with recycled water spray, mist, or runoff.

(f) No spray irrigation of any recycled water, other than disinfected tertiary recycled water, shall take place within 100 feet of a residence or a place where public exposure could be similar to that of a park, playground, or school yard.

(g) All use areas where recycled water is used that are accessible to the public shall be posted with signs that are visible to the public, in a size no less than 4 inches high by 8 inches wide, that include the following wording : "RECYCLED WATER - DO NOT DRINK". Each sign shall display an international symbol similar to that shown in figure 60310-A. The Department may accept alternative signage and wording, or an educational program, provided the applicant demonstrates to the Department that the alternative approach will assure an equivalent degree of public notification.

(h) Except as allowed under section 7604 of title 17, California Code of Regulations, no physical connection shall be made or allowed to exist between any recycled water system and any separate system conveying potable water.

(i) The portions of the recycled water piping system that are in areas subject to access by the general public shall not include any hose bibbs. Only quick couplers that differ from those used on the potable water system shall be used on the portions of the recycled water piping system in areas subject to public access.

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Water Recycling Criteria
FIGURE 60310-A

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Article 5. Dual Plumbed Recycled Water Systems.

§60313. General requirements.

(a) No person other than a recycled water agency shall deliver recycled water to a dual plumbed facility.

(b) No recycled water agency shall deliver recycled water for any internal use to any individually-owned residential units including free-standing structures, multiplexes, or condominiums.¹

(c) No recycled water agency shall deliver recycled water for internal use except for fire suppression systems, to any facility that produces or processes food products or beverages. For purposes of this Subsection, cafeterias or snack bars in a facility whose primary function does not involve the production or processing of foods or beverages are not considered facilities that produce or process foods or beverages.

(d) No recycled water agency shall deliver recycled water to a facility using a dual plumbed system unless the report required pursuant to section 13522.5 of the Water Code, and which meets the requirements set forth in section 60314, has been submitted to, and approved by, the regulatory agency.

§60314. Report submittal.

(a) For dual-plumbed recycled water systems, the report submitted pursuant to section 13522.5 of the Water Code shall contain the following information in addition to the information required by section 60323:

- (1) A detailed description of the intended use area identifying the following:
 - (A) The number, location, and type of facilities within the use area proposing to use dual plumbed systems,
 - (B) The average number of persons estimated to be served by each facility on a daily basis,
 - (C) The specific boundaries of the proposed use area including a map showing the location of each facility to be served,
 - (D) The person or persons responsible for operation of the dual plumbed system at each facility, and
 - (E) The specific use to be made of the recycled water at each facility.
- (2) Plans and specifications describing the following:
 - (A) Proposed piping system to be used,
 - (B) Pipe locations of both the recycled and potable systems,

¹ AB 1406, Chapter 537, Statutes of 2007, Water Code 13553, et seq., allows condominiums to be plumbed with recycled water, subject to a number of provisions. This regulation will be changed in future CDPH rulemaking to be consistent with the revised statutory requirements.

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(C) Type and location of the outlets and plumbing fixtures that will be accessible to the public, and

(D) The methods and devices to be used to prevent backflow of recycled water into the public water system.

(3) The methods to be used by the recycled water agency to assure that the installation and operation of the dual plumbed system will not result in cross connections between the recycled water piping system and the potable water piping system. This shall include a description of pressure, dye or other test methods to be used to test the system every four years.

(b) A master plan report that covers more than one facility or use site may be submitted provided the report includes the information required by this section. Plans and specifications for individual facilities covered by the report may be submitted at any time prior to the delivery of recycled water to the facility.

§60315. Design requirements.

The public water supply shall not be used as a backup or supplemental source of water for a dual-plumbed recycled water system unless the connection between the two systems is protected by an air gap separation which complies with the requirements of sections 7602 (a) and 7603 (a) of title 17, California Code of Regulations, and the approval of the public water system has been obtained.

§60316. Operation requirements.

(a) Prior to the initial operation of the dual-plumbed recycled water system and annually thereafter, the Recycled Water Agency shall ensure that the dual plumbed system within each facility and use area is inspected for possible cross connections with the potable water system. The recycled water system shall also be tested for possible cross connections at least once every four years. The testing shall be conducted in accordance with the method described in the report submitted pursuant to section 60314. The inspections and the testing shall be performed by a cross connection control specialist certified by the California-Nevada section of the American Water Works Association or an organization with equivalent certification requirements. A written report documenting the result of the inspection or testing for the prior year shall be submitted to the department within 30 days following completion of the inspection or testing.

(b) The recycled water agency shall notify the department of any incidence of backflow from the dual-plumbed recycled water system into the potable water system within 24 hours of the discovery of the incident.

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(c) Any backflow prevention device installed to protect the public water system serving the dual-plumbed recycled water system shall be inspected and maintained in accordance with section 7605 of Title 17, California Code of Regulations.

Article 5.1. Indirect Potable Reuse: Groundwater Replenishment – Surface Application.

§60320. Groundwater recharge. (repealed)

(a) Reclaimed water used for groundwater recharge of domestic water supply aquifers by surface spreading shall be at all times of a quality that fully protects public health. The State Department of Health Services' recommendations to the Regional Water Quality Control Boards for proposed groundwater recharge projects and for expansion of existing projects will be made on an individual case basis where the use of reclaimed water involves a potential risk to public health.

(b) The State Department of Health Services' recommendations will be based on all relevant aspects of each project, including the following factors: treatment provided; effluent quality and quantity; spreading area operations; soil characteristics; hydrogeology; residence time; and distance to withdrawal.

(c) The State Department of Health Services will hold a public hearing prior to making the final determination regarding the public health aspects of each groundwater recharge project. Final recommendations will be submitted to the Regional Water Quality Control Board in an expeditious manner.

§60320.100. General Requirements.

(a) The requirements of this Article apply to Groundwater Replenishment Reuse Projects (GRRPs) utilizing surface application, which receive initial permits from the Regional Board after June 18, 2014. Within 12 months after June 18, 2014, a project sponsor for a GRRP permitted on or before June 18, 2014, shall submit a report to the Department and appropriate Regional Board assessing its compliance with the requirements of this Article. For each requirement considered noncompliant and applicable by the Department or Regional Board, a project sponsor shall submit a schedule to the Department and Regional Board, for demonstrating and/or achieving compliance with the applicable requirements of this Article. Unless directed otherwise by the Department, a project sponsor’s report for a GRRP permitted on or before June 18, 2014, need not assess compliance with requirements of this Article that are required to be met prior to operation of a GRRP, except subsection (b) of this section. The report is subject to review and approval by the Department and Regional Board.

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(b) Prior to operation of a GRRP, the GRRP’s project sponsor shall obtain Department approval of a plan describing the steps a project sponsor will take to provide an alternative source of drinking water supply to all users of a producing drinking water well, or a Department-approved treatment mechanism a project sponsor will provide to all owners of a producing drinking water well, that as a result of the GRRP’s operation, as determined by the Department:

- (1) violates a California or federal drinking water standard;
- (2) has been degraded to the degree that it is no longer a safe source of drinking water; or
- (3) receives water that fails to meet section 60320.108.

(c) Prior to operating a GRRP, a project sponsor shall collect at least four samples, at least one sample each quarter, from each potentially affected aquifer. The samples shall be representative of water in each aquifer, taking into consideration seasonal variations, and be analyzed for the chemicals, contaminants, and characteristics pursuant to sections 60320.110, 60320.112, 60320.118, and 60320.120.

(d) A GRRP’s recycled municipal wastewater shall be retained underground for a period of time no less than the retention time required pursuant to sections 60320.108 and 60320.124. The GRRP shall be designed and operated in a manner that ensures water treated pursuant to this Article, beyond the boundary described in subsection (e)(2), meets the recycled municipal wastewater contributions (RWC) requirements in section 60320.116.

(e) Based on hydrogeologic flowpaths, a GRRP’s project sponsor shall provide the Department, Regional Board, and local well-permitting authorities a map of the GRRP site at a scale of 1:24,000 or larger (1 inch equals 2,000 feet or 1 inch equals less than 2,000 feet) or, if necessary, a site sketch at a scale providing more detail, that clearly indicates the criteria in paragraphs (1) – (4) below. A revised map shall be prepared and provided when conditions change such that the previous map no longer accurately reflects current conditions.

- (1) the location and boundaries of the GRRP;
- (2) a boundary representing a zone of controlled drinking water well construction, the greatest of the horizontal and vertical distances reflecting the retention times required pursuant to sections 60320.108 and 60320.124;
- (3) a secondary boundary representing a zone of potential controlled drinking water well construction, depicting the zone within which a well would extend the boundary in paragraph (2) to include existing or potential future drinking water wells, thereby requiring further study and potential mitigating activities prior to drinking water well construction; and
- (4) the location of all monitoring wells established pursuant to section 60320.126, and drinking water wells within two years travel time of the GRRP based on groundwater flow directions and velocities expected under GRRP operating conditions.

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(f) Prior to operating a GRRP, a project sponsor shall demonstrate to the Department and Regional Board that a project sponsor possesses adequate managerial and technical capability to assure compliance with this Article.

(g) Prior to replenishing a groundwater basin or an aquifer with recycled municipal wastewater, a GRRP’s project sponsor shall demonstrate that all treatment processes have been installed and can be operated by a project sponsor to achieve their intended function. A protocol describing the actions to be taken to meet this subsection shall be included in the engineering report submitted pursuant section 60323.

(h) In the engineering report required pursuant to section 60323, a project sponsor for a GRRP shall include a hydrogeological assessment of the proposed GRRP’s setting. The assessment shall include the following:

- (1) the qualifications of the individual(s) preparing the assessment;
- (2) a general description of geologic and hydrogeological setting of the groundwater basin(s) potentially directly impacted by the GRRP;
- (3) a detailed description of the stratigraphy beneath the GRRP, including the composition, extent, and physical properties of the affected aquifers; and
- (4) based on at least four rounds of consecutive quarterly monitoring to capture seasonal impacts;
 - (A) the existing hydrogeology and the hydrogeology anticipated as a result of the operation of the GRRP, and
 - (B) maps showing quarterly groundwater elevation contours, along with vector flow directions and calculated hydraulic gradients.

(i) If a project sponsor fails to complete compliance monitoring required pursuant to this Article, the Regional Board may determine water quality-related compliance based on available data.

(j) A project sponsor shall ensure that the recycled municipal wastewater used for a GRRP shall be from a wastewater management agency that is not in violation of the effluent limits pertaining to groundwater replenishment pursuant to this Article, as established in the wastewater management agency’s Regional Board permit.

(k) If a project sponsor has been directed by the Department or Regional Board to suspend surface application pursuant to this Article, surface application shall not resume until the project sponsor has obtained Department and Regional Board approval.

§60320.102. Public Hearing.

(a) A public hearing for a GRRP shall be held by a project sponsor prior to the Department’s submittal of its recommendations to the Regional Board for the GRRP’s

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initial permit and any time an increase in maximum RWC has been proposed but not addressed in a prior public hearing. Prior to a public hearing conducted pursuant to this section, a project sponsor shall provide the Department, for its review and approval, the information a project sponsor intends to present at the hearing. Following the Department’s approval of the information, a project sponsor shall place the information on a project sponsor’s Web site and in a repository that provides at least 30 days of public access to the information prior to the public hearing.

(b) Prior to placing the information required pursuant to subsection (a) in a repository, a project sponsor shall:

(1) Notify the public of the following;

- (A) the location and hours of operation of the repository,
- (B) the Internet address where the information may be viewed,
- (C) the purpose of the repository and public hearing,
- (D) the manner in which the public can provide comments, and
- (E) the date, time, and location of the public hearing; and

(2) At a minimum, notify the first downgradient drinking water well owner and well owners whose drinking water well is within 10 years from the GRRP based on groundwater flow directions and velocities.

(c) Unless directed otherwise by the Department, the public notification made pursuant to subsection (b)(2) shall be by direct mail and the notification made pursuant to subsection (b)(1) shall be delivered in a manner to reach persons whose source of drinking water may be impacted by the GRRP, using one or more of the following methods:

- (1) local newspaper(s) publication of general circulation;
- (2) mailed or direct delivery of a newsletter;
- (3) conspicuously placed statement in water bills; and/or
- (4) television and/or radio.

§60320.104. Lab Analyses.

(a) Analyses for contaminants having primary or secondary MCLs shall be performed by laboratories approved to perform such analyses by the Department utilizing Department-approved drinking water methods.

(b) Analyses for chemicals other than those having primary or secondary MCLs shall be described in the GRRP’s Operation Optimization Plan prepared pursuant to section 60320.122.

§60320.106. Wastewater Source Control.

A project sponsor shall ensure that the recycled municipal wastewater used for a GRRP shall be from a wastewater management agency that:

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(a) administers an industrial pretreatment and pollutant source control program; and

(b) implements and maintains a source control program that includes, at a minimum;

(1) an assessment of the fate of Department-specified and Regional Board-specified chemicals and contaminants through the wastewater and recycled municipal wastewater treatment systems,

(2) chemical and contaminant source investigations and monitoring that focuses on Department-specified and Regional Board-specified chemicals and contaminants,

(3) an outreach program to industrial, commercial, and residential communities within the portions of the sewage collection agency's service area that flows into the water reclamation plant subsequently supplying the GRRP, for the purpose of managing and minimizing the discharge of chemicals and contaminants at the source, and

(4) a current inventory of chemicals and contaminants identified pursuant to this section, including new chemicals and contaminants resulting from new sources or changes to existing sources, that may be discharged into the wastewater collection system.

§60320.108. Pathogenic Microorganism Control.

(a) A project sponsor shall design and operate a GRRP such that the recycled municipal wastewater used as recharge water for a GRRP receives treatment that achieves at least 12-log enteric virus reduction, 10-log *Giardia* cyst reduction, and 10-log *Cryptosporidium* oocyst reduction. The treatment train shall consist of at least three separate treatment processes. Except as provided in subsection (c), for each pathogen (i.e., virus, *Giardia* cyst, or *Cryptosporidium* oocyst), a separate treatment process may be credited with no more than 6-log reduction, with at least three processes each being credited with no less than 1.0-log reduction.

(b) At a minimum, the recycled municipal wastewater applied at a GRRP shall receive treatment that meets:

(1) the definition of filtered wastewater, pursuant to section 60301.320; and

(2) the definition of disinfected tertiary recycled water, pursuant to section 60301.230.

(c) For each month retained underground as demonstrated in subsection (e), the recycled municipal wastewater or recharge water will be credited with 1-log virus reduction. A GRRP meeting subsections (b)(1) and (2) or providing advanced treatment in accordance with section 60320.201 for the entire flow of the recycled municipal wastewater used for groundwater replenishment, that also demonstrates at least six months retention underground pursuant to subsection (e), will be credited with 10-log *Giardia* cyst reduction and 10-log *Cryptosporidium* oocyst reduction.

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(d) With the exception of log reduction credited pursuant to subsection (c), a project sponsor shall validate each of the treatment processes used to meet the requirements in subsection (a) for their log reduction by submitting a report for the Department’s review and approval, or by using a challenge test approved by the Department, that provides evidence of the treatment process’s ability to reliably and consistently achieve the log reduction. The report and/or challenge test shall be prepared by an engineer licensed in California with at least five years of experience, as a licensed engineer, in wastewater treatment and public water supply, including the evaluation of treatment processes for pathogen control. With the exception of retention time underground and a soil-aquifer treatment process, a project sponsor shall propose and include in its Operation Optimization Plan prepared pursuant to section 60320.122, on-going monitoring using the pathogenic microorganism of concern or a microbial, chemical, or physical surrogate parameter(s) that verifies the performance of each treatment process’s ability to achieve its credited log reduction.

(e) To demonstrate the retention time underground in subsection (c), a tracer study utilizing an added tracer shall be implemented under hydraulic conditions representative of normal GRRP operations. The retention time shall be the time representing the difference from when the water with the tracer is applied at the GRRP to when either; two percent (2%) of the initially introduced tracer concentration has reached the downgradient monitoring point, or ten percent (10%) of the peak tracer unit value observed at the downgradient monitoring point reached the monitoring point. A project sponsor for a GRRP shall initiate the tracer study prior to the end of the third month of operation. A project sponsor for a GRRP permitted on or before June 18, 2014, that has not already performed such a tracer study shall complete a tracer study demonstrating the retention time underground. With Department approval, an intrinsic tracer may be used in lieu of an added tracer, with no more credit provided than the corresponding virus log reduction in column 2 of Table 60320.108.

(f) For the purpose of siting a GRRP location during project planning and until a GRRP’s project sponsor has met the requirements of subsection (e), for each month of retention time estimated using the method in column 1, the recycled municipal wastewater or recharge water shall be credited with no more than the corresponding virus log reduction in column 2 of Table 60320.108.

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Table 60320.108

Column 1	Column 2
Method used to estimate the retention time to the nearest downgradient drinking water well	Virus Log Reduction Credit per Month
Tracer study utilizing an added tracer. ¹	1.0 log
Tracer study utilizing an intrinsic tracer. ¹	0.67 log
Numerical modeling consisting of calibrated finite element or finite difference models using validated and verified computer codes used for simulating groundwater flow.	0.50 log
Analytical modeling using existing academically-accepted equations such as Darcy’s Law to estimate groundwater flow conditions based on simplifying aquifer assumptions.	0.25 log

¹ The retention time shall be the time representing the difference from when the water with the tracer is applied at the GRRP to when either; two percent (2%) of the initially introduced tracer concentration has reached the downgradient monitoring point, or ten percent (10%) of the peak tracer unit value observed at the downgradient monitoring point reached the monitoring point.

(g) A project sponsor shall obtain Department approval for the protocol(s) to be used to establish the retention times in subsections (e) and (f).

(h) Based on changes in hydrogeological or climatic conditions since the most recent demonstration, the Department may require a GRRP’s project sponsor to demonstrate that the underground retention times required in this section are being met.

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(i) If a pathogen reduction in subsection (a) is not met based on the on-going monitoring required pursuant to subsection (d), within 24 hours of being aware a project sponsor shall immediately investigate the cause and initiate corrective actions. The project sponsor shall immediately notify the Department and Regional Board if the GRRP fails to meet the pathogen reduction criteria longer than 4 consecutive hours, or more than a total of 8 hours during any 7-day period. Failures of shorter duration shall be reported to the Regional Board by a project sponsor no later than 10 days after the month in which the failure occurred.

(j) If the effectiveness of a treatment train’s ability to reduce enteric virus is less than 10-logs, or Giardia cyst or Cryptosporidium oocyst reduction is less than 8-logs, a project sponsor shall immediately notify the Department and Regional Board, and discontinue application of recycled municipal wastewater at the GRRP, unless directed otherwise by the Department or Regional Board.

§60320.110. Nitrogen Compounds Control.

(a) To demonstrate control of the nitrogen compounds, a project sponsor shall:

(1) Each week, at least three days apart as specified in the GRRP’s Operation Optimization Plan, collect at least two total nitrogen samples (grab or 24-hour composite) representative of the recycled municipal wastewater or recharge water applied throughout the spreading area. Samples may be collected before or after surface application;

(2) Have the samples collected pursuant to paragraph (1) analyzed for total nitrogen, with the laboratory being required by a project sponsor to complete each analysis within 72 hours and have the result reported to a project sponsor within the same 72 hours if the result of any single sample exceeds 10 mg/L;

(3) If the average of the results of two consecutive samples collected pursuant to paragraph (1) exceeds 10 mg/L total nitrogen;

(A) take a confirmation sample and notify the Department and the Regional Board within 48 hours of being notified of the results by the laboratory,

(B) investigate the cause for the exceedances and take actions to reduce the total nitrogen concentrations to ensure continued or future exceedances do not occur, and

(C) initiate additional monitoring for nitrogen compounds as described in the GRRP’s Operation Optimization Plan, including locations in the groundwater basin and spreading area, to identify elevated concentrations and determine whether such elevated concentrations exceed or may lead to an exceedance of a nitrogen-based MCL; and

(4) If the average of the results of four consecutive samples collected pursuant to paragraph (1) exceeds 10 mg/L total nitrogen, suspend the surface application of recycled municipal wastewater. Surface application shall not resume until corrective actions have been taken and at least two consecutive total nitrogen sampling results are less than 10 mg/L.

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(b) As determined by the Department and based on a GRRP’s operation, including but not limited to the time the spreading area is out of service and utilization of a denitrification process, a project sponsor shall initiate additional monitoring for nitrogen compounds to identify elevated concentrations in the groundwater and determine whether such elevated concentrations exceed or may lead to an exceedance of a nitrogen-based MCL.

(c) Following Department and Regional Board approval, a project sponsor may initiate reduced monitoring frequencies for total nitrogen. A project sponsor may apply to the Department and Regional Board for reduced monitoring frequencies for total nitrogen if, for the most recent 24 months:

- (1) the average of all results did not exceed 5 mg/L total nitrogen; and
- (2) the average of a result and its confirmation sample (taken within 24 hours of receipt of the initial result) did not exceed 10 mg/L total nitrogen.

(d) If the results of reduced monitoring conducted as approved pursuant to subsection (c) exceed the total nitrogen concentration criteria in subsection (c), a project sponsor shall revert to the monitoring frequencies for total nitrogen prior to implementation of the reduced frequencies. Reduced frequency monitoring shall not resume unless the requirements of subsection (c) are met.

§60320.112. Regulated Contaminants and Physical Characteristics Control.

(a) Each quarter, as specified in the GRRP’s Operation Optimization Plan, a project sponsor shall collect samples (grab or 24-hour composite) representative of the applied recycled municipal wastewater and have the samples analyzed for:

- (1) the inorganic chemicals in Table 64431-A, except for nitrogen compounds;
- (2) the radionuclide chemicals in Tables 64442 and 64443;
- (3) the organic chemicals in Table 64444-A;
- (4) the disinfection byproducts in Table 64533-A; and
- (5) lead and copper.

(b) Recharge water (including recharge water after surface application) may be monitored in lieu of recycled municipal wastewater to satisfy the monitoring requirements in subsection (a)(4) if the fraction of recycled municipal wastewater in the recharge water is equal to or greater than the average fraction of recycled municipal wastewater in the recharge water applied over the quarter. If the fraction of recycled municipal wastewater in the recharge water being monitored is less than the average fraction of recycled municipal wastewater in the recharge water applied over the quarter, the reported value shall be adjusted to exclude the effects of dilution.

(c) Each year, the GRRP’s project sponsor shall collect at least one representative sample (grab or 24-hour composite) of the recycled municipal wastewater or recharge

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water and have the sample(s) analyzed for the secondary drinking water contaminants in Tables 64449-A and 64449-B.

(d) If a result of the monitoring performed pursuant to subsection (a) exceeds a contaminant’s MCL or action level (for lead and copper), a project sponsor shall collect another sample within 72 hours of notification of the result and then have it analyzed for the contaminant as confirmation.

(1) For a contaminant whose compliance with its MCL or action level is not based on a running annual average, if the average of the initial and confirmation sample exceeds the contaminant’s MCL or action level, or the confirmation sample is not collected and analyzed pursuant to this subsection, the GRRP’s project sponsor shall notify the Department and Regional Board within 24 hours and initiate weekly monitoring until four consecutive weekly results are below the contaminant’s MCL or action level. If the running four-week average exceeds the contaminant’s MCL or action level, the GRRP’s project sponsor shall notify the Department and Regional Board within 24 hours and, if directed by the Department or Regional Board, suspend application of the recycled municipal wastewater.

(2) For a contaminant whose compliance with its MCL is based on a running annual average, if the average of the initial and confirmation sample exceeds the contaminant’s MCL, or a confirmation sample is not collected and analyzed pursuant to this subsection, the GRRP shall initiate weekly monitoring for the contaminant until the running four-week average no longer exceeds the contaminant’s MCL.

(A) If the running four-week average exceeds the contaminant’s MCL, a project sponsor shall describe the reason(s) for the exceedance and provide a schedule for completion of corrective actions in a report submitted to the Department and Regional Board no later than 45 days following the quarter in which the exceedance occurred.

(B) If the running four-week average exceeds the contaminant’s MCL for sixteen consecutive weeks, a project sponsor shall notify the Department and Regional Board within 48 hours of knowledge of the exceedance and, if directed by the Department or Regional Board, suspend application of the recycled municipal wastewater.

(e) If the annual average of the results of the monitoring performed pursuant to subsection (c) exceeds a contaminant’s secondary MCL in Table 64449-A or the upper limit in Table 64449-B, a project sponsor shall initiate quarterly monitoring of the recycled municipal wastewater for the contaminant and, if the running annual average of quarterly-averaged results exceeds a contaminant’s secondary MCL or upper limit, describe the reason(s) for the exceedance and any corrective actions taken in a report submitted to Regional Board no later than 45 days following the quarter in which the exceedance occurred, with a copy concurrently provided to the Department. The annual monitoring in subsection (c) may resume if the running annual average of quarterly results does not exceed a contaminant’s secondary MCL or upper limit.

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(f) If four consecutive quarterly results for asbestos are below the detection limit in Table 64432-A for asbestos, monitoring for asbestos may be reduced to one sample every three years. Quarterly monitoring shall resume if asbestos is detected.

§60320.114. Diluent Water Requirements.

To be credited with diluent water used in calculating an RWC pursuant to section 60320.116, the GRRP shall comply with the requirements of this section and receive Department approval. For diluent water that is a Department-approved drinking water source, the GRRP’s project sponsor is exempt from subsections (a) and (b). The GRRP’s project sponsor shall:

(a) Monitor the diluent water quarterly for nitrate and nitrite and, within 72 hours of being informed by the laboratory of a nitrate, nitrite, or nitrate plus nitrite result exceeding a maximum contaminant level (MCL), collect a confirmation sample. If the average of the two samples is greater than an MCL;

(1) notify the Department and the Regional Board within 48 hours of receiving the confirmation sample result,

(2) investigate the cause(s) and implement corrective actions, and

(3) each week, collect and analyze two grab samples at least three days apart as specified in the GRRP’s Operation Optimization Plan. If the average of the results for a two-week period exceeds the MCL, surface application of the diluent water shall not be used in the calculation of RWC until corrective actions are made. Quarterly monitoring may resume if four consecutive results are below the MCL.

(b) Conduct a source water evaluation per the California-Nevada Section of American Water Works Association’s Watershed Sanitary Survey Guidance Manual (1993), as it may be amended, or other Department-approved evaluation, of the diluent water for Department review and approval that includes, but is not limited to:

(1) a description of the source of the diluent water;

(2) delineation of the origin and extent of the diluent water;

(3) the susceptibility of the diluent water to contamination;

(4) the identification of known or potential contaminants; and

(5) an inventory of the potential sources of diluent water contamination.

(c) Ensure diluent water does not exceed a primary MCL, a secondary MCL upper limit (if not historically used to recharge the basin), or a notification level (NL), and implement a Department-approved water quality monitoring plan for Department-specified contaminants to demonstrate compliance with the primary MCLs, secondary MCLs (except turbidity, color, and odor), and NLs. The plan shall also include:

(1) except for Department-approved drinking water sources used as a diluent water, monitoring of any chemicals or contaminants required pursuant to section 60320.120, based on the source water evaluation performed in subsection (b); and

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(2) actions to be taken in the event of non-compliance with a primary MCL, secondary MCL, or exceedance of a NL.

(d) Develop a method for determining the volume of diluent water to be credited and demonstrate that the diluent water will be introduced in a manner such that the diluent water volume will not result in the GRRP’s 120-month running monthly average RWC exceeding its maximum RWC at or beyond the boundary established pursuant to section 60320.100(e)(2). The method shall be submitted to the Department for review and approval, and be conducted at a frequency specified in the engineering report prepared pursuant to section 60323. The method shall address all conditions that influence how and when the recycled municipal wastewater and diluent water arrive at all points along the boundary. The conditions must include, but are not limited to, temporal variability in the diluent water supply and regional groundwater gradients, the difference in the distribution of the recycled municipal wastewater and diluent water between individual aquifers where more than one aquifer is replenished, and the difference in travel-time when recycled municipal wastewater and diluent water are introduced at different locations and/or times.

(e) For credit prior to the operation of the GRRP, but not to exceed 120 months:

(1) demonstrate that the diluent water met the nitrate, nitrite, and nitrate plus nitrite MCLs, NLs, and the water quality requirements in section 60320.112;

(2) provide evidence that the quantity of diluent water has been accurately determined and was distributed such that the proposed or permitted maximum RWC would not have been exceeded; and

(3) conduct a source water evaluation of the diluent water pursuant to subsection (b).

(f) In the Operation Optimization Plan prepared pursuant to section 60320.122, include a description of:

(1) how the diluent water will be distributed in a manner that ensures that the maximum RWC will not be exceeded during normal operations; and

(2) the actions to be taken in the event the diluent water is curtailed or is no longer available.

(g) If approved by the Department, recharge water may be monitored in lieu of a diluent water source if the diluent water source cannot be monitored directly in a manner that provides samples representative of the diluent water being applied.

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§60320.116. Recycled Municipal Wastewater Contribution (RWC) Requirements.

(a) Each month, for each surface application GRRP used for replenishing a groundwater basin, the GRRP’s project sponsor shall calculate the running monthly average (RMA) RWC based on the total volume of the recycled municipal wastewater and credited diluent water for the preceding 120 months. For GRRPs in operation less than 120 months, calculation of the RMA RWC shall commence after 30 months of recycled municipal wastewater application, based on the total volume of the recycled municipal wastewater and credited diluent water introduced during the preceding months.

(b) The GRRP’s RMA RWC, as determined in subsection (a), shall not exceed the maximum RWC specified for the GRRP by the Department.

(c) The initial maximum RWC shall not exceed 0.20 or an alternative initial RWC approved by the Department. An alternative initial RWC up to 1.0 may be approved by the Department based on, but not limited to, the Department’s review of the engineering report, the information obtained as a result of the public hearing(s), and a project sponsor’s demonstration that the treatment processes preceding the soil-aquifer treatment process will reliably achieve total organic carbon (TOC) concentrations no greater than 0.5 mg/L divided by the proposed initial RWC.

(d) A GRRP may increase its maximum RWC, provided:

- (1) the increase has been approved by the Department and Regional Board;
- (2) for the previous 52 weeks, the TOC 20-week running average, as monitored pursuant to section 62320.118, has not exceeded 0.5 mg/L divided by the proposed maximum RWC; and
- (3) the GRRP has received a permit from the Regional Board that allows operation of the GRRP at the increased maximum RWC.

(e) In addition to the requirements in subsection (d), prior to operating a GRRP at an RWC greater than 0.50 or 0.75, which must be achieved sequentially, a project sponsor shall:

- (1) provide a proposal to the Department prepared and signed by an engineer licensed in California with at least three years of experience in wastewater treatment and public water supply;
- (2) submit an updated engineering report and Operation Optimization Plan; and
- (3) provide evidence of compliance with section 60320.126(a).

(f) If the RMA RWC exceeds its maximum RWC, the GRRP’s project sponsor shall:

- (1) notify the Department and Regional Board in writing within seven days of knowledge of the exceedance; and

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(2) within 60 days of knowledge of the exceedance, implement corrective action(s) and additional actions that may be required by the Department or Regional Board, and submit a report to the Department and Regional Board describing the reason(s) for the exceedance and the corrective action(s) taken to avoid future exceedances.

§60320.118. Total Organic Carbon (TOC) and Soil-Aquifer Treatment (SAT) Process Requirements.

For each surface application GRRP used for replenishing a groundwater basin, the GRRP’s project sponsor shall assess the SAT process through the monitoring of TOC, indicator compounds, and surrogate parameters, as approved by the Department.

(a) At least once each week, a project sponsor shall analyze TOC from representative 24-hour composite samples of the following:

(1) the undiluted recycled municipal wastewater, prior to application or within the zone of percolation;

(2) the diluted percolated recycled municipal wastewater, with the value amended to negate the effect of the diluent water; or

(3) the undiluted recycled municipal wastewater prior to application, with the value amended using a soil-aquifer treatment factor approved by the Department and based on demonstration studies, which reliably predicts the removal efficiency of the process.

(b) Grab samples may be used in lieu of the 24-hour composite samples required in subsection (a) if:

(1) the GRRP demonstrates that a grab sample is representative of the water quality throughout a 24-hour period; or

(2) the entire recycled municipal wastewater stream has been treated by reverse osmosis meeting the criteria in sections 60320.201(a) and (b).

(c) Analytical results of the TOC monitoring performed pursuant to subsection (a) shall not exceed 0.5 mg/L divided by the RMA RWC based on:

(1) the 20-week running average of all TOC results; and

(2) the average of the last four TOC results.

(d) If the GRRP exceeds the limit in subsection (c)(1) or its approved increased TOC limit obtained pursuant to section 60320.130(c), based on a 20-week running average, a project sponsor shall take the following actions upon being notified of the results:

(1) immediately suspend the addition of recycled municipal wastewater until at least two consecutive results, three days apart, are less than the limit;

(2) notify the Department and Regional Board within seven days of suspension;
and

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(3) within 60 days, submit a report to the Department and Regional Board describing the reasons for the exceedance and the corrective actions to avoid future exceedances. At a minimum, the corrective actions shall include;

(A) a reduction of RWC sufficient to comply with the limit, and/or

(B) additional treatment demonstrated to the Department to remove TOC and chemicals or contaminants of concern to public health.

(e) If the GRRP exceeds the limit in subsection (c)(2) or its approved increased TOC limit obtained pursuant to section 60320.130(c), based on the average of the last four results, a project sponsor shall, within 60 days of being notified of the results, submit a report to the Department and Regional Board describing the reasons for the exceedance and the corrective actions taken to avoid future exceedances.

(f) Prior to a GRRP beginning initial operation and at five-year intervals thereafter, a project sponsor shall conduct a study to determine the occurrence of indicator compounds in the recycled municipal wastewater to be applied at the GRRP. Following completion of the study, a project sponsor shall propose at least three indicator compounds for use in meeting subsection (g). The protocol for the occurrence study, the study’s results, and the indicator compounds to be used shall be reviewed and approved by the Department.

(g) Quarterly, a project sponsor shall monitor the GRRP’s recycled municipal wastewater or recharge water prior to the SAT process and the water after the SAT process, but at a point no farther than 30 days downgradient of the spreading area. The monitoring shall include at least three indicator compounds based on the results of an occurrence study approved by the Department. If the monitoring results do not indicate a reduction of at least 90 percent in the concentration of indicator compounds by the SAT, excluding the effects of dilution from diluent water that may be present, a project sponsor shall investigate the reason for the low reduction and report the indicator compound and investigative results within 90 days of receipt of the analytical results.

(h) If the result of the investigation in subsection (g) concludes that the 90 percent reduction could not be demonstrated because the concentration of indicator compounds prior to the SAT process was not sufficient, a project sponsor shall consult with the Department and comply with an alternative monitoring plan approved by the Department. If a project sponsor demonstrates that there are not three compounds available and suitable for indicating a 90 percent reduction pursuant to subsection (g), a project sponsor may utilize an indicator compound that achieves a reduction less than 90 percent, with Department approval of the alternative indicator compound and reduction criteria.

(i) To use one or more wastewater chemicals in lieu of TOC, a project sponsor shall obtain approval from the Department. At a minimum, the chemical(s) used in lieu of TOC shall:

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- (1) be quantifiable in the wastewater, recycled municipal wastewater, groundwater, and throughout the treatment processes; and
- (2) have identifiable treatment performance standards as protective of public health as the TOC standards in this Article.

§60320.120. Additional Chemical and Contaminant Monitoring.

(a) Each quarter, the GRRP’s project sponsor shall sample and analyze the recycled municipal wastewater and the groundwater (from the downgradient monitoring wells established pursuant to section 60320.126) for the following:

- (1) Priority Toxic Pollutants (chemicals listed in 40 CFR section 131.38, “Establishment of numeric criteria for priority toxic pollutants for the State of California,” as the foregoing may be amended) specified by the Department, based on the Department’s review of the GRRP’s engineering report; and
- (2) Chemicals that the Department has specified, based on a review of the GRRP’s engineering report, the affected groundwater basin(s), and the results of the assessment performed pursuant to section 60320.106(b)(1).

(b) Each quarter, the GRRP’s project sponsor shall sample and analyze the recycled municipal wastewater for Department-specified chemicals having notification levels (NLs). Recharge water (including recharge water after surface application) may be monitored in lieu of recycled municipal wastewater if the fraction of recycled municipal wastewater in the recharge water is equal to or greater than the average fraction of recycled municipal wastewater in the recharge water applied over the quarter. If the fraction of recycled municipal wastewater in the recharge water being monitored is less than the average fraction of recycled municipal wastewater in the recharge water applied over the quarter, the reported value shall be adjusted to exclude the effects of dilution. If a result exceeds a NL, within 72 hours of notification of the result a project sponsor shall collect another sample and have it analyzed for the contaminant as confirmation. If the average of the initial and confirmation sample exceeds the contaminant’s NL, or a confirmation sample is not collected and analyzed pursuant to this subsection, the GRRP shall initiate weekly monitoring for the contaminant until the running four-week average no longer exceeds the NL.

(1) If the running four-week average exceeds the contaminant’s NL, a project sponsor shall describe the reason(s) for the exceedance and provide a schedule for completion of corrective actions in a report submitted to the Regional Board no later than 45 days following the quarter in which the exceedance occurred, with a copy concurrently provided to the Department.

(2) If the running four-week average exceeds the contaminant’s NL for sixteen consecutive weeks, a project sponsor shall notify the Department and Regional Board within 48 hours of knowledge of the exceedance.

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(c) A project sponsor may reduce monitoring for the chemicals in this section to once each year following Department approval based on the Department’s review of the most recent two years of results of the monitoring performed pursuant to this section.

(d) Annually, a project sponsor shall monitor the recycled municipal wastewater for indicator compounds specified by the Department and Regional Board based on the following:

- (1) a review of the GRRP’s engineering report;
- (2) the inventory developed pursuant to section 60320.106(b)(4);
- (3) the affected groundwater basin(s);
- (4) an indicator compound’s ability to characterize the presence of pharmaceuticals, endocrine disrupting chemicals, personal care products, and other indicators of the presence of municipal wastewater; and
- (5) the availability of a test method for a chemical.

(e) A chemical or contaminant detected as a result of monitoring conducted pursuant to this section shall be reported to the Department and Regional Board no later than the quarter following the quarter in which the results are received by the GRRP’s project sponsor.

§60320.122. Operation Optimization and Plan.

(a) Prior to operation of a GRRP, a project sponsor shall submit an Operation Optimization Plan to the Department and Regional Board for review and approval. At a minimum, the Operation Optimization Plan shall identify and describe the operations, maintenance, analytical methods, monitoring necessary for the GRRP to meet the requirements of this Article, and the reporting of monitoring results to the Department and Regional Board. A project sponsor shall be responsible for ensuring that the Operation Optimization Plan is, at all times, representative of the current operations, maintenance, and monitoring of the GRRP. A GRRP’s project sponsor shall make the Operation Optimization Plan available to the Department or Regional Board for review upon request.

(b) During the first year of operation of a GRRP and at all times thereafter, all treatment processes shall be operated in a manner providing optimal reduction of all chemicals and contaminants including:

- (1) microbial contaminants;
- (2) regulated contaminants identified in section 60320.112 and the nitrogen compounds required pursuant to section 60320.110; and
- (3) chemicals and contaminants required pursuant to section 60320.120.

(c) Within six months of optimizing treatment processes pursuant to subsection (b) and anytime thereafter operations are optimized that result in a change in operation, a

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project sponsor shall update the GRRP’s Operation Optimization Plan to include such changes in operational procedures and submit the operations plan to the Department for review.

§60320.124. Response Retention Time.

(a) The recycled municipal wastewater applied by a GRRP shall be retained underground for a period of time necessary to allow a project sponsor sufficient response time to identify treatment failures and implement actions, including those required pursuant to section 60320.100(b), necessary for the protection of public health.

(b) The response retention time required in subsection (a) must be approved by the Department, based on information provided in the engineering report required pursuant to section 60323. The response retention time shall be no less than two months.

(c) To demonstrate the retention time underground is no less than the response retention time approved pursuant to subsection (b), a tracer study utilizing an added tracer shall be implemented under hydraulic conditions representative of normal GRRP operations. With Department approval, an intrinsic tracer may be used in lieu of an added tracer. For each month of retention time estimated utilizing the approved intrinsic tracer, a project sponsor shall receive no more than 0.67 months credit. The retention time shall be the time representing the difference from when the water with the tracer is applied at the GRRP to when either; two percent (2%) of the initially introduced tracer concentration has reached the downgradient monitoring point, or ten percent (10%) of the peak tracer unit value observed at the downgradient monitoring point reaches the monitoring point. A project sponsor for a GRRP shall initiate the tracer study prior to the end of the third month of operation. A project sponsor for a GRRP permitted on or before June 18, 2014, that has not performed a tracer study shall complete a tracer study demonstrating the retention time underground.

(d) For the purpose of siting a GRRP location during project planning and until a GRRP’s project sponsor has met the requirements of subsection (c), for each month of retention time estimated using the method in column 1, the recycled municipal wastewater or recharge water may be credited with no more than the corresponding response time in column 2 of Table 60320.124.

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Table 60320.124

Column 1	Column 2
Method used to estimate the retention time	Response Time Credit per Month
Tracer study utilizing an added tracer. ¹	1.0 month
Tracer study utilizing an intrinsic tracer. ¹	0.67 month
Numerical modeling consisting of calibrated finite element or finite difference models using validated and verified computer codes used for simulating groundwater flow.	0.50 month
Analytical modeling using existing academically-accepted equations such as Darcy’s Law to estimate groundwater flow conditions based on simplifying aquifer assumptions.	0.25 month

¹ The retention time shall be the time representing the difference from when the water with the tracer is applied at the GRRP to when either; two percent (2%) of the initially introduced tracer concentration has reached the downgradient monitoring point, or ten percent (10%) of the peak tracer unit value observed at the downgradient monitoring point reaches the monitoring point.

(e) A project sponsor shall obtain Department approval for the protocol(s) to be used to establish the retention times in subsections (c) and (d).

(f) Upon request from the Department, a project sponsor shall demonstrate that the underground retention times required in this section are being met based on changes in hydrogeological or climatic conditions since the most recent demonstration.

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§60320.126. Monitoring Well Requirements.

(a) Prior to operating a GRRP, a project sponsor shall site and construct at least two monitoring wells downgradient of the GRRP such that:

(1) at least one monitoring well is located;

(A) no less than two weeks but no more than six months of travel through the saturated zone affected by the GRRP, and

(B) at least 30 days upgradient of the nearest drinking water well;

(2) in addition to the well(s) in paragraph (1) and after consultation with the Department, at least one monitoring well is located between the GRRP and the nearest downgradient drinking water well; and

(3) samples from the monitoring wells in paragraphs (1) and (2) can be;

(A) obtained independently from each aquifer, initially receiving the water used as a source of drinking water supply, that will receive the GRRP’s recharge water, and

(B) validated as receiving recharge water from the GRRP.

(b) In addition to the monitoring required pursuant to section 60320.120, from each monitoring well in subsection (a)(1), and each monitoring well in subsection (a)(2) that has recharge water located within one year travel time of the well(s), a project sponsor shall collect two samples prior to GRRP operation and at least one sample each quarter after operation begins. Each sample shall be analyzed for total nitrogen, nitrate, nitrite, the contaminants in Tables 64449-A and B of section 64449, and any contaminants and chemicals specified by the Department or Regional Board based on the results of the recycled municipal wastewater monitoring conducted pursuant to this Article.

(c) If a result from the monitoring conducted pursuant to subsection (b) exceeds 80 percent of a nitrate, nitrite, or nitrate plus nitrite MCL a project sponsor shall, within 48 hours of being notified of the result by the laboratory, collect another sample and have it analyzed for the contaminant. If the average of the result of the initial sample and the confirmation sample exceed the contaminant’s MCL, a project sponsor shall:

(1) within 24 hours of being notified by the laboratory of the confirmation sample result, notify the Department and Regional Board; and

(2) discontinue surface application of recycled municipal wastewater until corrective actions have been taken or evidence is provided to the Department and Regional Board that the contamination was not a result of the GRRP.

(d) For Department-specified chemical analyses completed in a month, a project sponsor shall ensure the laboratory electronically submits results to the Department no later than 45 days after the end of the month in which monitoring occurred, in a manner such that data is readily uploaded into the Department’s database. Utilization of the process described on the Department’s Web site will satisfy this requirement.

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(e) The GRRP’s project sponsor may reduce monitoring for the chemicals and contaminants in subsection (b) to once each year following Department approval based on the Department’s review of the most recent two years of monitoring results.

§60320.128. Reporting.

(a) No later than six months after the end of each calendar year, a project sponsor shall provide a report to the Department and Regional Board. Public water systems and drinking water well owners having downgradient sources potentially affected by the GRRP and within 10 years groundwater travel time from the GRRP shall be notified by direct mail and/or electronic mail of the availability of the report. The report shall be prepared by an engineer licensed in California and experienced in the fields of wastewater treatment and public water supply. The report shall include the following:

- (1) A summary of the GRRP’s compliance status with the monitoring requirements and criteria of this Article during the previous calendar year;
- (2) For any violations of this Article during the previous calendar year;
 - (A) the date, duration, and nature of the violation,
 - (B) a summary of any corrective actions and/or suspensions of surface application of recycled municipal wastewater resulting from a violation, and
 - (C) if uncorrected, a schedule for and summary of all remedial actions;
- (3) Any detections of monitored chemicals or contaminants, and any observed trends in the monitoring wells and diluent water supplies;
- (4) Information pertaining to the vertical and horizontal migration of the recharge water plume;
- (5) A description of any changes in the operation of any unit processes or facilities;
- (6) A description of any anticipated changes, along with an evaluation of the expected impact of the changes on subsequent unit processes;
- (7) The estimated quantity and quality of the recycled municipal wastewater and diluent water to be applied for the next calendar year;
- (8) A summary of the measures taken to comply with section 60320.106 and 60320.100(j), and the effectiveness of the implementation of the measures; and
- (9) Increases in RWC during the previous calendar year and RWC increases anticipated for the next calendar year.

(b) Every five years from the date of the initial approval of the engineering report required pursuant to section 60323, a project sponsor shall update the report to address any project changes and submit the report to the Department and Regional Board. The update shall include, but not be limited to:

- (1) anticipated RWC increases, a description of how the RWC requirements in section 60320.116 will be met, and the expected impact the increase will have on the GRRP’s ability to meet the requirements of this Article;

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(2) evidence that the requirements associated with retention time in section 60320.108, if applicable, and section 60320.124 have been met; and

(3) a description of any inconsistencies between previous groundwater model predictions and the observed and/or measured values, as well as a description of how subsequent predictions will be accurately determined.

§60320.130. Alternatives.

(a) A project sponsor may use an alternative to a requirement in this Article if the GRRP’s project sponsor:

(1) demonstrates to the Department that the proposed alternative assures at least the same level of protection to public health;

(2) receives written approval from the Department prior to implementation of the alternative; and

(3) if required by the Department or Regional Board, conducts a public hearing on the proposed alternative, disseminates information to the public, and receives public comments, pursuant to sections 60320.102(b) and (c).

(b) Unless specified otherwise by the Department, the demonstration in subsection (a)(1) shall include the results of a review of the proposed alternative by an independent scientific advisory panel that includes a toxicologist, a registered engineering geologist or hydrogeologist, an engineer licensed in California with at least three years of experience in wastewater treatment and public drinking water supply, a microbiologist, and a chemist.

(c) The TOC limit specified in section 60320.118(c) may be increased if:

(1) The increased TOC limit is approved by the Department and Regional Board;

(2) The GRRP has been in operation for the most recent ten consecutive years;

(3) A project sponsor submits a proposal to the Department prepared and signed by an engineer licensed in California with at least three years of experience in the fields of wastewater treatment and public water supply. The proposal shall include the following, based on the most recent ten consecutive years of operation;

(A) GRRP operations, monitoring, and compliance data,

(B) Evidence that the GRRP has a history of compliance with the requirements of their Regional Board permit,

(C) Evidence that the water collected at all downgradient drinking water wells and monitoring wells impacted by the GRRP has met the primary drinking water standards,

(D) Analytical or treatment studies requested by the Department to make the determination in subparagraph (C),

(E) Validation of appropriate construction and siting of monitoring wells pursuant to section 60320.126(a), and

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(F) A study defining the water quality changes, including organic carbon characterization, as a result of the impact of the GRRP; and

(4) A project sponsor performs a health effects evaluation that assesses the health risks to consumers of water impacted by the GRRP, including any anticipated water quality changes resulting from the proposed increased TOC limit. The evaluation shall include the following;

(A) An exposure assessment that characterizes the quality of the water consumed and the quantity of contaminants and chemicals consumed,

(B) All available human epidemiologic studies of the population that has consumed water impacted by the GRRP,

(C) The results of laboratory animal studies and health risk assessments available in peer-reviewed literature pertaining to water impacted by the GRRP and anticipated water quality changes resulting from the proposed increased TOC, including studies or assessments where extrapolation of data may be relevant,

(D) A health risk assessment of the potential individual and cumulative effects of each of the regulated contaminants identified in section 62320.112, and the chemicals or contaminants monitored pursuant to sections 60320.120(a) and (c), that includes;

1. lifetime risks of cancer, and
2. risks of non-cancer effects, and

(E) A report detailing comments, questions, concerns, and conclusions of a review by an independent scientific peer review advisory panel that includes, as a minimum, a toxicologist, an epidemiologist, an engineering geologist or hydrogeologist registered in California, an engineer licensed in California with at least three years of experience in wastewater treatment and public water supply, a microbiologist, and a chemist.

Article 5.2. Indirect Potable Reuse: Groundwater Replenishment – Subsurface Application.

§60320.200. General Requirements.

(a) The requirements of this Article apply to Groundwater Replenishment Reuse Projects (GRRPs) utilizing subsurface application, which receive initial permits from the Regional Board after June 18, 2014. Within 12 months after June 18, 2014, a project sponsor for a GRRP permitted on or before June 18, 2014, shall submit a report to the Department and appropriate Regional Board assessing its compliance with the requirements of this Article. For each requirement considered noncompliant and applicable by the Department or Regional Board, a project sponsor shall submit a schedule to the Department and Regional Board, for demonstrating and/or achieving compliance with the applicable requirements of this Article. Unless directed otherwise by the Department, a project sponsor’s report for a GRRP permitted on or before June 18, 2014, need not assess compliance with requirements of this Article that are required to be

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met prior to operation of a GRRP, except subsection (b) of this section. The report is subject to review and approval by the Department and Regional Board. A project sponsor shall ensure the GRRP continuously treats, with full advanced treatment meeting the criteria in section 60320.201, the entire recycled municipal wastewater stream prior to application.

(b) Prior to operation of a GRRP, the GRRP’s project sponsor shall obtain Department approval of a plan describing the steps a project sponsor will take to provide an alternative source of drinking water supply to all users of a producing drinking water well, or a Department-approved treatment mechanism a project sponsor will provide to all owners of a producing drinking water well, that as a result of the GRRP’s operation, as determined by the Department:

- (1) violates a California or federal drinking water standard;
- (2) has been degraded to the degree that it is no longer a safe source of drinking water; or
- (3) receives water that fails to meet section 60320.208.

(c) Prior to operating a GRRP, a project sponsor shall collect at least four samples, at least one sample each quarter, from each potentially affected aquifer. The samples shall be representative of water in each aquifer, taking into consideration seasonal variations, and be analyzed for the chemicals, contaminants, and characteristics pursuant to sections 60320.210, 60320.212, 60320.218, and 60320.220.

(d) A GRRP’s recycled municipal wastewater shall be retained underground for a period of time no less than the retention time required pursuant to sections 60320.208 and 60320.224. The GRRP shall be designed and operated in a manner that ensures water treated pursuant to this Article, beyond the boundary described in subsection (e)(2), meets the recycled municipal wastewater contributions (RWC) requirements in section 60320.216.

(e) Based on hydrogeologic flowpaths, a GRRP’s project sponsor shall provide the Department, Regional Board, and local well-permitting authorities a map of the GRRP site at a scale of 1:24,000 or larger (1 inch equals 2,000 feet or 1 inch equals less than 2,000 feet) or, if necessary, a site sketch at a scale providing more detail, that clearly indicates the criteria in paragraphs (1) – (4) below. A revised map shall be prepared and provided when conditions change such that the previous map no longer accurately reflects current conditions.

- (1) the location and boundaries of the GRRP;
- (2) a boundary representing a zone of controlled drinking water well construction, the greatest of the horizontal and vertical distances reflecting the retention times required pursuant to sections 60320.208 and 60320.224;
- (3) a secondary boundary representing a zone of potential controlled drinking water well construction, depicting the zone within which a well would extend the

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boundary in paragraph (2) to include existing or potential future drinking water wells, thereby requiring further study and potential mitigating activities prior to drinking water well construction; and

(4) the location of all monitoring wells established pursuant to section 60320.226, and drinking water wells within two years travel time of the GRRP based on groundwater flow directions and velocities expected under GRRP operating conditions.

(f) Prior to operating a GRRP, a project sponsor shall demonstrate to the Department and Regional Board that a project sponsor possesses adequate managerial and technical capability to assure compliance with this Article.

(g) Prior to replenishing a groundwater basin or an aquifer with recycled municipal wastewater, a GRRP’s project sponsor shall demonstrate that all treatment processes have been installed and can be operated by a project sponsor to achieve their intended function. A protocol describing the actions to be taken to meet this subsection shall be included in the engineering report submitted pursuant section 60323.

(h) In the engineering report required pursuant to section 60323, a project sponsor for a GRRP shall include a hydrogeological assessment of the proposed GRRP’s setting. The assessment shall include the following:

- (1) the qualifications of the individual(s) preparing the assessment;
- (2) a general description of geologic and hydrogeological setting of the groundwater basin(s) potentially directly impacted by the GRRP;
- (3) a detailed description of the stratigraphy beneath the GRRP, including the composition, extent, and physical properties of the affected aquifers; and
- (4) based on at least four rounds of consecutive quarterly monitoring to capture seasonal impacts;

(A) the existing hydrogeology and the hydrogeology anticipated as a result of the operation of the GRRP, and

(B) maps showing quarterly groundwater elevation contours, along with vector flow directions and calculated hydraulic gradients.

(i) If a project sponsor fails to complete compliance monitoring required pursuant to this Article, the Regional Board may determine water quality-related compliance based on available data.

(j) A project sponsor shall ensure that the recycled municipal wastewater used for a GRRP shall be from a wastewater management agency that is not in violation of the effluent limits pertaining to groundwater replenishment pursuant to this Article, as established in the wastewater management agency’s Regional Board permit.

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(k) If a project sponsor has been directed by the Department or Regional Board to suspend subsurface application pursuant to this Article, subsurface application shall not resume until the project sponsor has obtained Department and Regional Board approval.

§60320.201. Advanced Treatment Criteria.

Full advanced treatment is the treatment of an oxidized wastewater, as defined in section 60301.650, using a reverse osmosis and an oxidation treatment process that, at a minimum, meets the criteria of this section.

(a) A project sponsor shall select for use a reverse osmosis membrane such that:

(1) each membrane element used in the project has achieved a minimum rejection of sodium chloride of no less than 99.0 percent (99.0%) and an average (nominal) rejection of sodium chloride of no less than 99.2 percent (99.2%), as demonstrated through Method A of ASTM International’s method D4194-03 (2008) using the following substitute test conditions:

(A) tests are operated at a recovery of no less than 15 percent (15%);

(B) sodium chloride rejection is based on three or more successive measurements, after flushing and following at least 30 minutes of operation having demonstrated that rejection has stabilized;

(C) an influent pH no less than 6.5 and no greater than 8.0; and

(D) an influent sodium chloride concentration of no greater than 2,000 mg/L, to be verified prior to the start of testing; and

(2) during the first twenty weeks of full-scale operation the membrane produces a permeate with no more than five percent (5%) of the sample results having TOC concentrations greater than 0.25 mg/L, as verified through monitoring no less frequent than weekly.

(b) For the reverse osmosis treatment process, a project sponsor shall propose, for Department review and approval, on-going performance monitoring (e.g., conductivity or TOC) that indicates when the integrity of the process has been compromised. The proposal shall include at least one form of continuous monitoring, as well as the associated surrogate and/or operational parameter limits and alarm settings that indicate when the integrity has been compromised.

(c) To demonstrate a sufficient oxidation process has been designed for implementation, a project sponsor shall:

(1) Perform an occurrence study on the project’s municipal wastewater to identify indicator compounds and select a total of at least nine indicator compounds, with at least one from each of the functional groups in subparagraphs (A) through (I) below. A project sponsor shall submit an occurrence study protocol, as well as the subsequent results and chosen indicator compounds, to the Department for review and approval.

(A) Hydroxy Aromatic

(B) Amino/Acylamino Aromatic

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(C) Nonaromatic with carbon double bonds

(D) Deprotonated Amine

(E) Alkoxy Polyaromatic

(F) Alkoxy Aromatic

(G) Alkyl Aromatic

(H) Saturated Aliphatic

(I) Nitro Aromatic

(2) Utilize an oxidation process that achieves optimal removal of the indicator compounds selected in paragraph (1) such that removal is no less than;

(A) 0.5-log (69 percent) for each indicator compound representing the functional groups in paragraphs (1)(A) through (1)(G), and

(B) 0.3-log (50 percent) for each indicator compound representing the functional groups in paragraphs (1)(H) and (1)(I).

(3) Establish at least one surrogate or operational parameter that reflects the removal of at least five of the nine indicator compounds selected pursuant to paragraph (1) such that;

(A) at least one of the five indicator compounds represents at least one functional group in paragraphs (1)(A) through (1)(G),

(B) at least one of the five indicator compounds represents at least one functional group in paragraphs (1)(H) or (1)(I),

(C) at least one surrogate or operational parameter is capable of being monitored continuously, recorded, and have associated alarms, and

(D) a surrogate or operational parameter, including the parameter in subparagraph (C), is identified that indicates when the process may no longer meet the criteria established in paragraph (2).

(4) Conduct testing that includes confirmation of the findings of the occurrence study in paragraph (1) and provides evidence that the requirements of paragraphs (2) and (3) can be met with a full-scale oxidation process. The testing shall include challenge or spiking tests conducted to determine the removal differential under normal operating conditions utilizing, at minimum, the nine indicator compounds identified in paragraph (1). A project sponsor shall submit a testing protocol, as well as the subsequent results, to the Department for review and approval.

(d) In lieu of demonstrating that a sufficient oxidation process has been designed for implementation pursuant to subsection (c), a project sponsor may conduct testing demonstrating that the oxidation process will provide no less than 0.5-log (69 percent) reduction of 1,4-dioxane.

(1) A project sponsor shall submit a testing protocol, as well as the subsequent results, to the Department for review and approval. The testing shall include challenge or spiking tests, using 1,4-dioxane, to demonstrate the proposed oxidation process will achieve the minimum 0.5-log reduction under the proposed oxidation process’s normal full-scale operating conditions.

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(2) A project sponsor shall establish surrogate and/or operational parameters that reflect whether the minimum 0.5-log 1,4-dioxane reduction design criteria is being met. At least one surrogate or operational parameter shall be capable of being monitored continuously, recorded, and have associated alarms that indicate when the process is not operating as designed.

(e) During the full-scale operation of the oxidation process designed pursuant to subsection (c) or (d), a project sponsor shall continuously monitor the surrogate and/or operational parameters established pursuant to subsection (c)(3)(C) or (d)(2), as applicable. A project sponsor shall implement, in full-scale operation, the oxidation process as designed pursuant to subsection (c) or (d).

(f) Within 60 days after completing the initial 12-months of monitoring pursuant to subsection (e), a project sponsor shall submit a report to the Department and Regional Board that includes:

- (1) the results of the monitoring performed in subsection (e);
- (2) the removal differential of the indicator compounds;
- (3) a description of the efficacy of the surrogate and/or operational parameters to reflect the removal differential of the indicator compounds; and
- (4) a description of actions taken, or to be taken, if the indicator compound removal did not meet the associated design criteria in subsection (c) or (d), the continuous surrogate and/or operational parameter monitoring in subsection (c)(3)(C) or (d)(2) fails to correspond to the differential indicator compound removal, or the surrogate and/or operational parameter established in subsection (c)(3)(D) or (d)(2) is not met.

(g) Within 60 days after completing the initial 12 months of operation of the reverse osmosis process, a project sponsor shall submit a report to the Department and Regional Board describing the effectiveness of the treatment, process failures, and actions taken in the event the on-going monitoring in subsection (b) indicated that process integrity was compromised.

(h) Each quarter, a project sponsor shall calculate what percent of results of the quarter’s monitoring, conducted pursuant to subsections (b) and (e), did not meet the surrogate and/or operational parameter limits established to assure proper on-going performance of the reverse osmosis and oxidation processes. If the percent is greater than ten, within 45 days after the end of the quarter a project sponsor shall:

- (1) submit a report to the Department and Regional Board describing the corrective actions planned or taken to reduce the percent to ten percent (10%) or less; and
- (2) consult with the Department and, if required, comply with an alternative monitoring plan approved by the Department.

(i) Each month a project sponsor shall collect samples (grab or composite) representative of the effluent of the advanced treatment process and have the samples

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analyzed for contaminants having MCLs and notification levels (NLs). After 12 consecutive months with no results exceeding an MCL or NL, a project sponsor may apply for a reduced monitoring frequency. The reduced monitoring frequency shall be no less than quarterly. Monitoring conducted pursuant to this subsection may be used in lieu of the monitoring (for the same contaminants) required pursuant to sections 60320.212 and 60320.220. The effluent of the advanced treatment process shall not exceed an MCL.

§60320.202. Public Hearing.

(a) A public hearing for a GRRP shall be held by a project sponsor prior to the Department’s submittal of its recommendations to the Regional Board for the GRRP’s initial permit and any time an increase in maximum RWC has been proposed but not addressed in a prior public hearing. Prior to a public hearing conducted pursuant to this section, a project sponsor shall provide the Department, for its review and approval, the information a project sponsor intends to present at the hearing. Following the Department’s approval of the information, a project sponsor shall place the information on a project sponsor’s Web site and in a repository that provides at least 30 days of public access to the information prior to the public hearing.

(b) Prior to placing the information required pursuant to subsection (a) in a repository, a project sponsor shall:

(1) Notify the public of the following;

- (A) the location and hours of operation of the repository,
- (B) the Internet address where the information may be viewed,
- (C) the purpose of the repository and public hearing,
- (D) the manner in which the public can provide comments, and
- (E) the date, time, and location of the public hearing; and

(2) At a minimum, notify the first downgradient drinking water well owner and well owners whose drinking water well is within 10 years from the GRRP based on groundwater flow directions and velocities.

(c) Unless directed otherwise by the Department, the public notification made pursuant to subsection (b)(2) shall be by direct mail and the notification made pursuant to subsection (b)(1) shall be delivered in a manner to reach persons whose source of drinking water may be impacted by the GRRP, using one or more of the following methods:

- (1) local newspaper(s) publication of general circulation;
- (2) mailed or direct delivery of a newsletter;
- (3) conspicuously placed statement in water bills; and/or
- (4) television and/or radio.

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§60320.204. Lab Analyses.

(a) Analyses for contaminants having primary or secondary MCLs shall be performed by laboratories approved to perform such analyses by the Department utilizing Department-approved drinking water methods.

(b) Analyses for chemicals other than those having primary or secondary MCLs shall be described in the GRRP’s Operation Optimization Plan prepared pursuant to section 60320.222.

§60320.206. Wastewater Source Control.

A project sponsor shall ensure that the recycled municipal wastewater used for a GRRP shall be from a wastewater management agency that:

(a) administers an industrial pretreatment and pollutant source control program; and

(b) implements and maintains a source control program that includes, at a minimum;

(1) an assessment of the fate of Department-specified and Regional Board-specified chemicals and contaminants through the wastewater and recycled municipal wastewater treatment systems,

(2) chemical and contaminant source investigations and monitoring that focuses on Department-specified and Regional Board-specified chemicals and contaminants,

(3) an outreach program to industrial, commercial, and residential communities within the portions of the sewage collection agency’s service area that flows into the water reclamation plant subsequently supplying the GRRP, for the purpose of managing and minimizing the discharge of chemicals and contaminants at the source, and

(4) a current inventory of chemicals and contaminants identified pursuant to this section, including new chemicals and contaminants resulting from new sources or changes to existing sources, that may be discharged into the wastewater collection system.

§60320.208. Pathogenic Microorganism Control.

(a) A project sponsor shall design and operate a GRRP such that the recycled municipal wastewater used as recharge water for a GRRP receives treatment that achieves at least 12-log enteric virus reduction, 10-log Giardia cyst reduction, and 10-log Cryptosporidium oocyst reduction. The treatment train shall consist of at least three separate treatment processes. For each pathogen (i.e., virus, Giardia cyst, or Cryptosporidium oocyst), a separate treatment process may be credited with no more than 6-log reduction, with at least three processes each being credited with no less than 1.0-log reduction.

(b) For each month retained underground as demonstrated in subsection (e), the recycled municipal wastewater or recharge water will be credited with 1-log virus reduction.

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(c) With the exception of log reduction credited pursuant to subsection (b), a project sponsor shall validate each of the treatment processes used to meet the requirements in subsection (a) for their log reduction by submitting a report for the Department’s review and approval, or by using a challenge test approved by the Department, that provides evidence of the treatment process’s ability to reliably and consistently achieve the log reduction. The report and/or challenge test shall be prepared by an engineer licensed in California with at least five years of experience, as a licensed engineer, in wastewater treatment and public water supply, including the evaluation of treatment processes for pathogen control. With the exception of retention time underground, a project sponsor shall propose and include in its Operation Optimization Plan prepared pursuant to section 60320.222, on-going monitoring using the pathogenic microorganism of concern or a microbial, chemical, or physical surrogate parameter(s) that verifies the performance of each treatment process’s ability to achieve its credited log reduction.

(d) To demonstrate the retention time underground in subsection (b) a tracer study utilizing an added tracer shall be implemented under hydraulic conditions representative of normal GRRP operations. The retention time shall be the time representing the difference from when the water with the tracer is applied at the GRRP to when either; two percent (2%) of the initially introduced tracer concentration has reached the downgradient monitoring point, or ten percent (10%) of the peak tracer unit value observed at the downgradient monitoring point reached the monitoring point. A project sponsor for a GRRP shall initiate the tracer study prior to the end of the third month of operation. A project sponsor for a GRRP permitted on or before June 18, 2014, that has not already performed such a tracer study shall complete a tracer study demonstrating the retention time underground. With Department approval, an intrinsic tracer may be used in lieu of an added tracer, with no more credit provided than the corresponding virus log reduction in column 2 of Table 60320.208.

(e) For the purpose of siting a GRRP location during project planning and until a GRRP’s project sponsor has met the requirements of subsection (d), for each month of retention time estimated using the method in column 1, the recycled municipal wastewater or recharge water shall be credited with no more than the corresponding virus log reduction in column 2 of Table 60320.208.

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Table 60320.208

Column 1	Column 2
Method used to estimate the retention time to the nearest downgradient drinking water well	Virus Log Reduction Credit per Month
Tracer study utilizing an added tracer. ¹	1.0 log
Tracer study utilizing an intrinsic tracer. ¹	0.67 log
Numerical modeling consisting of calibrated finite element or finite difference models using validated and verified computer codes used for simulating groundwater flow.	0.50 log
Analytical modeling using existing academically-accepted equations such as Darcy’s Law to estimate groundwater flow conditions based on simplifying aquifer assumptions.	0.25 log

¹ The retention time shall be the time representing the difference from when the water with the tracer is applied at the GRRP to when either; two percent (2%) of the initially introduced tracer concentration has reached the downgradient monitoring point, or ten percent (10%) of the peak tracer unit value observed at the downgradient monitoring point reached the monitoring point.

(f) A project sponsor shall obtain Department approval for the protocol(s) to be used to establish the retention times in subsections (d) and (e).

(g) Based on changes in hydrogeological or climatic conditions since the most recent demonstration, the Department may require a GRRP’s project sponsor to demonstrate that the underground retention times required in this section are being met.

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(h) If a pathogen reduction in subsection (a) is not met based on the on-going monitoring required pursuant to subsection (c), within 24 hours of being aware a project sponsor shall immediately investigate the cause and initiate corrective actions. The project sponsor shall immediately notify the Department and Regional Board if the GRRP fails to meet the pathogen reduction criteria longer than 4 consecutive hours, or more than a total of 8 hours during any 7-day period. Failures of shorter duration shall be reported to the Regional Board by a project sponsor no later than 10 days after the month in which the failure occurred.

(i) If the effectiveness of a treatment train’s ability to reduce enteric virus is less than 10-logs, or Giardia cyst or Cryptosporidium oocyst reduction is less than 8-logs, a project sponsor shall immediately notify the Department and Regional Board, and discontinue application of recycled municipal wastewater at the GRRP, unless directed otherwise by the Department or Regional Board.

§60320.210. Nitrogen Compounds Control.

(a) To demonstrate control of the nitrogen compounds, a project sponsor shall:

(1) Each week, at least three days apart as specified in the GRRP’s Operation Optimization Plan, collect at least two total nitrogen samples (grab or 24-hour composite) representative of the recycled municipal wastewater or recharge water applied. Samples may be collected before or after subsurface application;

(2) Have the samples collected pursuant to paragraph (1) analyzed for total nitrogen, with the laboratory being required by a project sponsor to complete each analysis within 72 hours and have the result reported to a project sponsor within the same 72 hours if the result of any single sample exceeds 10 mg/L;

(3) If the average of the results of two consecutive samples collected pursuant to paragraph (1) exceeds 10 mg/L total nitrogen;

(A) take a confirmation sample and notify the Department and the Regional Board within 48 hours of being notified of the results by the laboratory,

(B) investigate the cause for the exceedances and take actions to reduce the total nitrogen concentrations to ensure continued or future exceedances do not occur, and

(C) initiate additional monitoring for nitrogen compounds as described in the GRRP’s Operation Optimization Plan, including locations in the groundwater basin, to identify elevated concentrations and determine whether such elevated concentrations exceed or may lead to an exceedance of a nitrogen-based MCL; and

(4) If the average of the results of four consecutive samples collected pursuant to paragraph (1) exceeds 10 mg/L total nitrogen, suspend the subsurface application of recycled municipal wastewater. Subsurface application shall not resume until corrective actions have been taken and at least two consecutive total nitrogen sampling results are less than 10 mg/L.

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(b) Following Department and Regional Board approval, a project sponsor may initiate reduced monitoring frequencies for total nitrogen. A project sponsor may apply to the Department and Regional Board for reduced monitoring frequencies for total nitrogen if, for the most recent 12 months:

- (1) the average of all results did not exceed 5 mg/L total nitrogen; and
- (2) the average of a result and its confirmation sample (taken within 24 hours of receipt of the initial result) did not exceed 10 mg/L total nitrogen.

(c) If the results of reduced monitoring conducted as approved pursuant to subsection (b) exceed the total nitrogen concentration criteria in subsection (b), a project sponsor shall revert to the monitoring frequencies for total nitrogen prior to implementation of the reduced frequencies. Reduced frequency monitoring shall not resume unless the requirements of subsection (b) are met.

§60320.212. Regulated Contaminants and Physical Characteristics Control.

(a) Each quarter, as specified in the GRRP’s Operation Optimization Plan, a project sponsor shall collect samples (grab or 24-hour composite) representative of the applied recycled municipal wastewater and have the samples analyzed for:

- (1) the inorganic chemicals in Table 64431-A, except for nitrogen compounds;
- (2) the radionuclide chemicals in Tables 64442 and 64443;
- (3) the organic chemicals in Table 64444-A;
- (4) the disinfection byproducts in Table 64533-A; and
- (5) lead and copper.

(b) Recharge water may be monitored in lieu of recycled municipal wastewater to satisfy the monitoring requirements in subsection (a)(4) if the fraction of recycled municipal wastewater in the recharge water is equal to or greater than the average fraction of recycled municipal wastewater in the recharge water applied over the quarter. If the fraction of recycled municipal wastewater in the recharge water being monitored is less than the average fraction of recycled municipal wastewater in the recharge water applied over the quarter, the reported value shall be adjusted to exclude the effects of dilution.

(c) Each year, the GRRP’s project sponsor shall collect at least one representative sample (grab or 24-hour composite) of the recycled municipal wastewater and have the sample(s) analyzed for the secondary drinking water contaminants in Tables 64449-A and 64449-B.

(d) If a result of the monitoring performed pursuant to subsection (a) exceeds a contaminant’s MCL or action level (for lead and copper), a project sponsor shall collect another sample within 72 hours of notification of the result and then have it analyzed for the contaminant as confirmation.

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(1) For a contaminant whose compliance with its MCL or action level is not based on a running annual average, if the average of the initial and confirmation sample exceeds the contaminant’s MCL or action level, or the confirmation sample is not collected and analyzed pursuant to this subsection, the GRRP’s project sponsor shall notify the Department and Regional Board within 24 hours and initiate weekly monitoring until four consecutive weekly results are below the contaminant’s MCL or action level. If the running four-week average exceeds the contaminant’s MCL or action level, the GRRP’s project sponsor shall notify the Department and Regional Board within 24 hours and, if directed by the Department or Regional Board, suspend application of the recycled municipal wastewater.

(2) For a contaminant whose compliance with its MCL is based on a running annual average, if the average of the initial and confirmation sample exceeds the contaminant’s MCL, or a confirmation sample is not collected and analyzed pursuant to this subsection, the GRRP shall initiate weekly monitoring for the contaminant until the running four-week average no longer exceeds the contaminant’s MCL.

(A) If the running four-week average exceeds the contaminant’s MCL, a project sponsor shall describe the reason(s) for the exceedance and provide a schedule for completion of corrective actions in a report submitted to the Department and Regional Board no later than 45 days following the quarter in which the exceedance occurred.

(B) If the running four-week average exceeds the contaminant’s MCL for sixteen consecutive weeks, a project sponsor shall notify the Department and Regional Board within 48 hours of knowledge of the exceedance and, if directed by the Department or Regional Board, suspend application of the recycled municipal wastewater.

(e) If the annual average of the results of the monitoring performed pursuant to subsection (c) exceeds a contaminant’s secondary MCL in Table 64449-A or the upper limit in Table 64449-B, a project sponsor shall initiate quarterly monitoring of the recycled municipal wastewater for the contaminant and, if the running annual average of quarterly-averaged results exceeds a contaminant’s secondary MCL or upper limit, describe the reason(s) for the exceedance and any corrective actions taken a report submitted to the Regional Board no later than 45 days following the quarter in which the exceedance occurred, with a copy concurrently provided to the Department. The annual monitoring in subsection (c) may resume if the running annual average of quarterly results does not exceed a contaminant’s secondary MCL or upper limit.

(f) If four consecutive quarterly results for asbestos are below the detection limit in Table 64432-A for asbestos, monitoring for asbestos may be reduced to one sample every three years. Quarterly monitoring shall resume if asbestos is detected.

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§60320.214. Diluent Water Requirements.

To be credited with diluent water used in calculating an RWC pursuant to section 60320.216, the GRRP shall comply with the requirements of this section and receive Department approval. For diluent water that is a Department-approved drinking water source, the GRRP’s project sponsor is exempt from subsections (a) and (b). The GRRP’s project sponsor shall:

(a) Monitor the diluent water quarterly for nitrate and nitrite and, within 72 hours of being informed by the laboratory of a nitrate, nitrite, or nitrate plus nitrite result exceeding a maximum contaminant level (MCL), collect a confirmation sample. If the average of the two samples is greater than an MCL;

(1) notify the Department and the Regional Board within 48 hours of receiving the confirmation sample result,

(2) investigate the cause(s) and implement corrective actions, and

(3) each week, collect and analyze two grab samples at least three days apart as specified in the GRRP’s Operation Optimization Plan. If the average of the results for a two-week period exceeds the MCL, subsurface application of the diluent water shall not be used in the calculation of RWC until corrective actions are made. Quarterly monitoring may resume if four consecutive results are below the MCL.

(b) Conduct a source water evaluation per the California-Nevada Section of American Water Works Association’s Watershed Sanitary Survey Guidance Manual (1993), as it may be amended, or other Department-approved evaluation, of the diluent water for Department review and approval that includes, but is not limited to:

(1) a description of the source of the diluent water;

(2) delineation of the origin and extent of the diluent water;

(3) the susceptibility of the diluent water to contamination;

(4) the identification of known or potential contaminants; and

(5) an inventory of the potential sources of diluent water contamination.

(c) Ensure diluent water does not exceed a primary MCL, a secondary MCL upper limit, or a notification level (NL), and implement a Department-approved water quality monitoring plan for Department-specified contaminants to demonstrate compliance with the primary MCLs, secondary MCLs, and NLs. The plan shall also include:

(1) except for Department-approved drinking water sources used as a diluent water, monitoring of any chemicals or contaminants required pursuant to section 60320.220, based on the source water evaluation performed in subsection (b); and

(2) actions to be taken in the event of non-compliance with a primary MCL, secondary MCL, or exceedance of a NL.

(d) Develop a method for determining the volume of diluent water to be credited and demonstrate that the diluent water will be introduced in a manner such that the diluent water volume will not result in the GRRP’s 120-month running monthly average RWC

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exceeding its maximum RWC at or beyond the boundary established pursuant to section 60320.200(e)(2). The method shall be submitted to the Department for review and approval, and be conducted at a frequency specified in the engineering report prepared pursuant to section 60323. The method shall address all conditions that influence how and when the recycled municipal wastewater and diluent water arrive at all points along the boundary. The conditions must include, but are not limited to, temporal variability in the diluent water supply and regional groundwater gradients, the difference in the distribution of the recycled municipal wastewater and diluent water between individual aquifers where more than one aquifer is replenished, and the difference in travel-time when recycled municipal wastewater and diluent water are introduced at different locations and/or times.

(e) For credit prior to the operation of the GRRP, but not to exceed 120 months:

(1) demonstrate that the diluent water met the nitrate, nitrite, and nitrate plus nitrite MCLs, NLs, and the water quality requirements in section 60320.212;

(2) provide evidence that the quantity of diluent water has been accurately determined and was distributed such that the proposed or permitted maximum RWC would not have been exceeded; and

(3) conduct a source water evaluation of the diluent water pursuant to subsection (b).

(f) In the Operation Optimization Plan prepared pursuant to section 60320.222, include a description of:

(1) how the diluent water will be distributed in a manner that ensures that the maximum RWC will not be exceeded during normal operations; and

(2) the actions to be taken in the event the diluent water is curtailed or is no longer available.

(g) If approved by the Department, recharge water may be monitored in lieu of a diluent water source if the diluent water source cannot be monitored directly in a manner that provides samples representative of the diluent water being applied.

§60320.216. Recycled Municipal Wastewater Contribution (RWC) Requirements.

(a) Each month, for each subsurface application GRRP used for replenishing a groundwater basin, the GRRP’s project sponsor shall calculate the running monthly average (RMA) RWC based on the total volume of the recycled municipal wastewater and credited diluent water for the preceding 120 months. For GRRPs in operation less than 120 months, calculation of the RMA RWC shall commence after 30 months of recycled municipal wastewater application, based on the total volume of the recycled municipal wastewater and credited diluent water introduced during the preceding months.

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(b) The GRRP’s RMA RWC, as determined in subsection (a), shall not exceed the maximum RWC specified for the GRRP by the Department.

(c) The initial maximum RWC, which may be up to 1.0, will be based on, but not limited to, the Department’s review of the engineering report, information obtained as a result of the public hearing(s), and a project sponsor’s demonstration that the treatment processes will reliably achieve TOC concentrations no greater than 0.5 mg/L.

(d) A GRRP may increase its maximum RWC, provided:

- (1) the increase has been approved by the Department and Regional Board;
- (2) for the previous 52 weeks the TOC 20-week running average, as monitored pursuant to section 62320.218, has not exceeded 0.5 mg/L; and
- (3) the GRRP has received a permit from the Regional Board that allows operation of the GRRP at the increased maximum RWC.

(e) If the RMA RWC exceeds its maximum RWC, the GRRP’s project sponsor shall:

- (1) notify the Department and Regional Board in writing within seven days of knowledge of the exceedance; and
- (2) within 60 days of knowledge of the exceedance, implement corrective action(s) and additional actions that may be required by the Department or Regional Board, and submit a report to the Department and Regional Board describing the reason(s) for the exceedance and the corrective action(s) taken to avoid future exceedances.

§60320.218. Total Organic Carbon Requirements.

(a) For each subsurface application GRRP used for replenishing a groundwater basin, the GRRP’s project sponsor shall monitor the applied recycled municipal wastewater for TOC as follows:

- (1) Prior to replenishment, at least one 24-hour composite sample each week.
- (2) Grab samples may be used in lieu of the 24-hour composite samples required in paragraph (1) if the GRRP demonstrates that a grab sample is representative of the water quality throughout a 24-hour period.

(b) Analytical results of the TOC monitoring performed pursuant to subsection (a) shall not exceed 0.5 mg/L based on:

- (1) the 20-week running average of all TOC results; and
- (2) the average of the last four TOC results.

(c) If the GRRP exceeds the limit in subsection (b)(1) based on a 20-week running average, a project sponsor shall take the following actions upon being notified of the results:

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(1) immediately suspend the addition of recycled municipal wastewater until at least two consecutive results, three days apart, are less than the limit;

(2) notify the Department and Regional Board within seven days of suspension; and

(3) within 60 days, submit a report to the Department and Regional Board describing the reasons for the exceedance and the corrective actions to avoid future exceedances. At a minimum, the corrective actions shall include a reduction of RWC sufficient to comply with the limit.

(d) If the GRRP exceeds the limit in subsection (b)(2) based on the average of the last four results, a project sponsor shall, within 60 days of being notified of the results, submit a report to the Department and Regional Board describing the reasons for the exceedance and the corrective actions taken to avoid future exceedances.

(e) To use one or more wastewater chemicals in lieu of TOC, a project sponsor shall obtain approval from the Department. At a minimum, the chemical(s) used in lieu of TOC shall:

(1) be quantifiable in the wastewater, recycled municipal wastewater, groundwater, and throughout the treatment processes; and

(2) have identifiable treatment performance standards as protective of public health as the TOC standards in this Article.

§60320.220. Additional Chemical and Contaminant Monitoring.

(a) Each quarter, the GRRP’s project sponsor shall sample and analyze the recycled municipal wastewater and the groundwater (from the downgradient monitoring wells established pursuant to section 60320.226) for the following:

(1) Priority Toxic Pollutants (chemicals listed in 40 CFR section 131.38, “Establishment of numeric criteria for priority toxic pollutants for the State of California”, as the foregoing may be amended) specified by the Department, based on the Department’s review of the GRRP’s engineering report; and

(2) Chemicals that the Department has specified, based on a review of the GRRP’s engineering report, the affected groundwater basin(s), and the results of the assessment performed pursuant to section 60320.206(b)(1).

(b) Each quarter, the GRRP’s project sponsor shall sample and analyze the recycled municipal wastewater for Department-specified chemicals having notification levels (NLs). Recharge water may be monitored in lieu of recycled municipal wastewater if the fraction of recycled municipal wastewater in the recharge water is equal to or greater than the average fraction of recycled municipal wastewater in the recharge water applied over the quarter. If the fraction of recycled municipal wastewater in the recharge water being monitored is less than the average fraction of recycled municipal wastewater in the recharge water applied over the quarter, the reported value shall be adjusted to exclude

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the effects of dilution. If a result exceeds a NL, within 72 hours of notification of the result a project sponsor shall collect another sample and have it analyzed for the contaminant as confirmation. If the average of the initial and confirmation sample exceeds the contaminant’s NL, or a confirmation sample is not collected and analyzed pursuant to this subsection, the GRRP shall initiate weekly monitoring for the contaminant until the running four-week average no longer exceeds the NL.

(1) If the running four-week average exceeds the contaminant’s NL, a project sponsor shall describe the reason(s) for the exceedance and provide a schedule for completion of corrective actions in a report submitted to the Regional Board no later than 45 days following the quarter in which the exceedance occurred, with a copy concurrently provided to the Department.

(2) If the running four-week average exceeds the contaminant’s NL for sixteen consecutive weeks, a project sponsor shall notify the Department and Regional Board within 48 hours of knowledge of the exceedance.

(c) A project sponsor may reduce monitoring for the chemicals in this section to once each year following Department approval based on the Department’s review of the most recent two years of results of the monitoring performed pursuant to this section.

(d) Annually, a project sponsor shall monitor the recycled municipal wastewater for indicator compounds specified by the Department and Regional Board based on the following:

- (1) a review of the GRRP’s engineering report;
- (2) the inventory developed pursuant to section 60320.206(b)(4);
- (3) the affected groundwater basin(s);
- (4) an indicator compound’s ability to characterize the presence of pharmaceuticals, endocrine disrupting chemicals, personal care products, and other indicators of the presence of municipal wastewater; and
- (5) the availability of a test method for a chemical.

(e) A chemical or contaminant detected as a result of monitoring conducted pursuant to this section shall be reported to the Department and Regional Board no later than the quarter following the quarter in which the results are received by the GRRP’s project sponsor.

§60320.222. Operation Optimization and Plan.

(a) Prior to operation of a GRRP, a project sponsor shall submit an Operation Optimization Plan to the Department and Regional Board for review and approval. At a minimum, the Operation Optimization Plan shall identify and describe the operations, maintenance, analytical methods, monitoring necessary for the GRRP to meet the requirements of this Article, and the reporting of monitoring results to the Department and Regional Board. A project sponsor shall be responsible for ensuring that the

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Operation Optimization Plan is, at all times, representative of the current operations, maintenance, and monitoring of the GRRP. A GRRP’s project sponsor shall make the Operation Optimization Plan available to the Department or Regional Board for review upon request.

(b) During the first year of operation of a GRRP and at all times thereafter, all treatment processes shall be operated in a manner providing optimal reduction of all chemicals and contaminants including:

- (1) microbial contaminants;
- (2) regulated contaminants identified in section 60320.212 and the nitrogen compounds required pursuant to section 60320.210; and
- (3) chemicals and contaminants required pursuant to section 60320.220.

(c) Within six months of optimizing treatment processes pursuant to subsection (b) and anytime thereafter operations are optimized that result in a change in operation, a project sponsor shall update the GRRP’s Operation Optimization Plan to include such changes in operational procedures and submit the operations plan to the Department for review.

§60320.224. Response Retention Time.

(a) The recycled municipal wastewater applied by a GRRP shall be retained underground for a period of time necessary to allow a project sponsor sufficient response time to identify treatment failures and implement actions, including those required pursuant to section 60320.200(b), necessary for the protection of public health.

(b) The response retention time required in subsection (a) must be approved by the Department, based on information provided in the engineering report required pursuant to section 60323. The response retention time shall be no less than two months.

(c) To demonstrate the retention time underground is no less than the response retention time approved pursuant to subsection (b), a tracer study utilizing an added tracer shall be implemented under hydraulic conditions representative of normal GRRP operations. With Department approval, an intrinsic tracer may be used in lieu of an added tracer. For each month of retention time estimated utilizing the approved intrinsic tracer, a project sponsor shall receive no more than 0.67 months credit. The retention time shall be the time representing the difference from when the water with the tracer is applied at the GRRP to when either; two percent (2%) of the initially introduced tracer concentration has reached the downgradient monitoring point, or ten percent (10%) of the peak tracer unit value observed at the downgradient monitoring point reaches the monitoring point. A project sponsor for a GRRP shall initiate the tracer study prior to the end of the third month of operation. A project sponsor for a GRRP permitted on or

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before June 18, 2014, that has not performed a tracer study shall complete a tracer study demonstrating the retention time underground.

(d) For the purpose of siting a GRRP location during project planning and until a GRRP’s project sponsor has met the requirements of subsection (c), for each month of retention time estimated using the method in column 1, the recycled municipal wastewater or recharge water may be credited with no more than the corresponding response time in column 2 of Table 60320.224.

Table 60320.224

Column 1	Column 2
Method used to estimate the retention time	Response Time Credit per Month
Tracer study utilizing an added tracer. ¹	1.0 month
Tracer study utilizing an intrinsic tracer. ¹	0.67 month
Numerical modeling consisting of calibrated finite element or finite difference models using validated and verified computer codes used for simulating groundwater flow.	0.50 month
Analytical modeling using existing academically-accepted equations such as Darcy’s Law to estimate groundwater flow conditions based on simplifying aquifer assumptions.	0.25 month

¹ The retention time shall be the time representing the difference from when the water with the tracer is applied at the GRRP to when either; two percent (2%) of the initially introduced tracer concentration has reached the downgradient monitoring point, or ten percent (10%) of the peak tracer unit value observed at the downgradient monitoring point reaches the monitoring point.

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(e) A project sponsor shall obtain Department approval for the protocol(s) to be used to establish the retention times in subsections (c) and (d).

(f) Upon request from the Department, a project sponsor shall demonstrate that the underground retention times required in this section are being met based on changes in hydrogeological or climatic conditions since the most recent demonstration.

§60320.226. Monitoring Well Requirements.

(a) Prior to operating a GRRP, a project sponsor shall site and construct at least two monitoring wells downgradient of the GRRP such that:

(1) at least one monitoring well is located;

(A) no less than two weeks but no more than six months of travel time from the GRRP, and

(B) at least 30 days upgradient of the nearest drinking water well;

(2) in addition to the well(s) in paragraph (1) and after consultation with the Department, at least one monitoring well is located between the GRRP and the nearest downgradient drinking water well; and

(3) samples from the monitoring wells in paragraphs (1) and (2) can be;

(A) obtained independently from each aquifer initially receiving the water used as a source of drinking water supply that will receive the GRRP’s recharge water, and

(B) validated as receiving recharge water from the GRRP.

(b) In addition to the monitoring required pursuant to section 60320.220, from each monitoring well in subsection (a)(1), and each monitoring well in subsection (a)(2) that has recharge water located within one year travel time of the well(s), a project sponsor shall collect two samples prior to GRRP operation and at least one sample each quarter after operation begins. Each sample shall be analyzed for total nitrogen, nitrate, nitrite, the contaminants in Tables 64449-A and B of section 64449, and any contaminants and chemicals specified by the Department or Regional Board based on the results of the recycled municipal wastewater monitoring conducted pursuant to this Article.

(c) If a result from the monitoring conducted pursuant to subsection (b) exceeds 80 percent of a nitrate, nitrite, or nitrate plus nitrite MCL a project sponsor shall, within 48 hours of being notified of the result by the laboratory, collect another sample and have it analyzed for the contaminant. If the average of the result of the initial sample and the confirmation sample exceed the contaminant’s MCL, a project sponsor shall:

(1) within 24 hours of being notified by the laboratory of the confirmation sample result, notify the Department and Regional Board; and

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(2) discontinue subsurface application of recycled municipal wastewater until corrective actions have been taken or evidence is provided to the Department and Regional Board that the contamination was not a result of the GRRP.

(d) For Department-specified chemical analyses completed in a month, a project sponsor shall ensure the laboratory electronically submits results to the Department no later than 45 days after the end of the month in which monitoring occurred, in a manner such that data is readily uploaded into the Department’s database. Utilization of the process described on the Department’s Web site will satisfy this requirement.

(e) The GRRP’s project sponsor may discontinue monitoring for the chemicals and contaminants in subsection (b) following Department approval based on the Department’s review of the most recent two years of monitoring results.

§60320.228. Reporting.

(a) No later than six months after the end of each calendar year, a project sponsor shall provide a report to the Department and Regional Board. Public water systems and drinking water well owners having downgradient sources potentially affected by the GRRP and within 10 years groundwater travel time from the GRRP shall be notified by direct mail and/or electronic mail of the availability of the report. The report shall be prepared by an engineer licensed in California and experienced in the fields of wastewater treatment and public water supply. The report shall include the following:

- (1) A summary of the GRRP’s compliance status with the monitoring requirements and criteria of this Article during the previous calendar year;
- (2) For any violations of this Article during the previous calendar year;
 - (A) the date, duration, and nature of the violation,
 - (B) a summary of any corrective actions and/or suspensions of subsurface application of recycled municipal wastewater resulting from a violation, and
 - (C) if uncorrected, a schedule for and summary of all remedial actions;
- (3) Any detections of monitored chemicals or contaminants, and any observed trends in the monitoring wells and diluent water supplies;
- (4) Information pertaining to the vertical and horizontal migration of the recharge water plume;
- (5) A description of any changes in the operation of any unit processes or facilities;
- (6) A description of any anticipated changes, along with an evaluation of the expected impact of the changes on subsequent unit processes;
- (7) The estimated quantity and quality of the recycled municipal wastewater and diluent water to be applied for the next calendar year;
- (8) A summary of the measures taken to comply with section 60320.206 and 60320.200(j), and the effectiveness of the implementation of the measures; and

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(9) Increases in RWC during the previous calendar year and RWC increases anticipated for the next calendar year.

(b) Every five years from the date of the initial approval of the engineering report required pursuant to section 60323, a project sponsor shall update the report to address any project changes and submit the report to the Department and Regional Board. The update shall include, but not be limited to:

(1) anticipated RWC increases, a description of how the RWC requirements in section 60320.216 will be met, and the expected impact the increase will have on the GRRP’s ability to meet the requirements of this Article;

(2) evidence that the requirements associated with retention time in section 60320.208, if applicable, and section 60320.224 have been met; and

(3) a description of any inconsistencies between previous groundwater model predictions and the observed and/or measured values, as well as a description of how subsequent predictions will be accurately determined.

§60320.230. Alternatives.

(a) A project sponsor may use an alternative to a requirement in this Article if the GRRP’s project sponsor:

(1) demonstrates to the Department that the proposed alternative assures at least the same level of protection to public health;

(2) receives written approval from the Department prior to implementation of the alternative; and

(3) if required by the Department or Regional Board, conducts a public hearing on the proposed alternative, disseminates information to the public, and receives public comments, pursuant to sections 60320.202(b) and (c).

(b) Unless specified otherwise by the Department, the demonstration in subsection (a)(1) shall include the results of a review of the proposed alternative by an independent scientific advisory panel that includes a toxicologist, a registered engineering geologist or hydrogeologist, an engineer licensed in California with at least three years of experience in wastewater treatment and public drinking water supply, a microbiologist, and a chemist.

Article 5.5. Other Methods of Treatment.

§60320.5. Other methods of treatment.

Methods of treatment other than those included in this chapter and their reliability features may be accepted if the applicant demonstrates to the satisfaction of the State Department of Health that the methods of treatment and reliability features will assure an equal degree of treatment and reliability.

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Article 6. Sampling and Analysis.

§60321. Sampling and analysis.

(a) Disinfected secondary-23, disinfected secondary-2.2, and disinfected tertiary recycled water shall be sampled at least once daily for total coliform bacteria. The samples shall be taken from the disinfected effluent and shall be analyzed by an approved laboratory.

(b) Disinfected tertiary recycled water shall be continuously sampled for turbidity using a continuous turbidity meter and recorder following filtration. Compliance with the daily average operating filter effluent turbidity shall be determined by averaging the levels of recorded turbidity taken at four-hour intervals over a 24-hour period. Compliance with turbidity pursuant to section 60301.320 (a)(2)(B) and (b)(1) shall be determined using the levels of recorded turbidity taken at intervals of no more than 1.2-hours over a 24-hour period. Should the continuous turbidity meter and recorder fail, grab sampling at a minimum frequency of 1.2-hours may be substituted for a period of up to 24-hours. The results of the daily average turbidity determinations shall be reported quarterly to the regulatory agency.

(c) The producer or supplier of the recycled water shall conduct the sampling required in subsections (a) and (b).

Article 7. Engineering Report and Operational Requirements.

§60323. Engineering report.

(a) No person shall produce or supply recycled water for reuse from a water reclamation plant without a Department-approved engineering report.

(b) The report shall be prepared by a qualified engineer licensed in California and experienced in the field of wastewater treatment, and shall contain a description of the design of the proposed reclamation system. The report shall clearly indicate the means for compliance with these regulations and any other features specified by the regulatory agency.

(c) The report shall contain a contingency plan which will assure that no untreated or inadequately treated wastewater will be delivered to the use area.

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§60325. Personnel.

(a) Each reclamation plant shall be provided with a sufficient number of qualified personnel to operate the facility effectively so as to achieve the required level of treatment at all times.

(b) Qualified personnel shall be those meeting requirements established pursuant to Chapter 9 (commencing with Section 13625) of the Water Code.

§60327. Maintenance.

A preventive maintenance program shall be provided at each reclamation plant to ensure that all equipment is kept in a reliable operating condition.

§60329. Operating records and reports.

(a) Operating records shall be maintained at the reclamation plant or a central depository within the operating agency. These shall include: all analyses specified in the reclamation criteria; records of operational problems, plant and equipment breakdowns, and diversions to emergency storage or disposal; all corrective or preventive action taken.

(b) Process or equipment failures triggering an alarm shall be recorded and maintained as a separate record file. The recorded information shall include the time and cause of failure and corrective action taken.

(c) A monthly summary of operating records as specified under (a) of this section shall be filed monthly with the regulatory agency.

(d) Any discharge of untreated or partially treated wastewater to the use area, and the cessation of same, shall be reported immediately by telephone to the regulatory agency, the State Department of Health, and the local health officer.

§60331. Bypass.

There shall be no bypassing of untreated or partially treated wastewater from the reclamation plant or any intermediate unit processes to the point of use.

Article 8. General Requirements of Design.

§60333. Flexibility of design.

The design of process piping, equipment arrangement, and unit structures in the reclamation plant must allow for efficiency and convenience in operation and maintenance and provide flexibility of operation to permit the highest possible degree of treatment to be obtained under varying circumstances.

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§60335. Alarms.

(a) Alarm devices required for various unit processes as specified in other sections of these regulations shall be installed to provide warning of:

- (1) Loss of power from the normal power supply.
- (2) Failure of a biological treatment process.
- (3) Failure of a disinfection process.
- (4) Failure of a coagulation process.
- (5) Failure of a filtration process.
- (6) Any other specific process failure for which warning is required by the regulatory agency.

(b) All required alarm devices shall be independent of the normal power supply of the reclamation plant.

(c) The person to be warned shall be the plant operator, superintendent, or any other responsible person designated by the management of the reclamation plant and capable of taking prompt corrective action.

(d) Individual alarm devices may be connected to a master alarm to sound at a location where it can be conveniently observed by the attendant. In case the reclamation plant is not attended full time, the alarm(s) shall be connected to sound at a police station, fire station or other full time service unit with which arrangements have been made to alert the person in charge at times that the reclamation plant is unattended.

§60337. Power supply.

The power supply shall be provided with one of the following reliability features:

- (a) Alarm and standby power source.
- (b) Alarm and automatically actuated short-term retention or disposal provisions as specified in Section 60341.
- (c) Automatically actuated long-term storage or disposal provisions as specified in Section 60341.

Article 9. Reliability Requirements for Primary Effluent.

§60339. Primary treatment.

Reclamation plants producing reclaimed water exclusively for uses for which primary effluent is permitted shall be provided with one of the following reliability features:

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(a) Multiple primary treatment units capable of producing primary effluent with one unit not in operation.

(b) Long-term storage or disposal provisions as specified in Section 60341.

Article 10. Reliability Requirements for Full Treatment.

§60341. Emergency storage or disposal.

(a) Where short-term retention or disposal provisions are used as a reliability feature, these shall consist of facilities reserved for the purpose of storing or disposing of untreated or partially treated wastewater for at least a 24-hour period. The facilities shall include all the necessary diversion devices, provisions for odor control, conduits, and pumping and pump back equipment. All of the equipment other than the pump back equipment shall be either independent of the normal power supply or provided with a standby power source.

(b) Where long-term storage or disposal provisions are used as a reliability feature, these shall consist of ponds, reservoirs, percolation areas, downstream sewers leading to other treatment or disposal facilities or any other facilities reserved for the purpose of emergency storage or disposal of untreated or partially treated wastewater. These facilities shall be of sufficient capacity to provide disposal or storage of wastewater for at least 20 days, and shall include all the necessary diversion works, provisions for odor and nuisance control, conduits, and pumping and pump back equipment. All of the equipment other than the pump back equipment shall be either independent of the normal power supply or provided with a standby power source.

(c) Diversion to a less demanding reuse is an acceptable alternative to emergency disposal of partially treated wastewater provided that the quality of the partially treated wastewater is suitable for the less demanding reuse.

(d) Subject to prior approval by the regulatory agency, diversion to a discharge point which requires lesser quality of wastewater is an acceptable alternative to emergency disposal of partially treated wastewater.

(e) Automatically actuated short-term retention or disposal provisions and automatically actuated long-term storage or disposal provisions shall include, in addition to provisions of (a), (b), (c), or (d) of this section, all the necessary sensors, instruments, valves and other devices to enable fully automatic diversion of untreated or partially treated wastewater to approved emergency storage or disposal in the event of failure of a treatment process and a manual reset to prevent automatic restart until the failure is corrected.

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§60343. Primary treatment.

All primary treatment unit processes shall be provided with one of the following reliability features:

- (a) Multiple primary treatment units capable of producing primary effluent with one unit not in operation.
- (b) Standby primary treatment unit process.
- (c) Long-term storage or disposal provisions.

§60345. Biological treatment.

All biological treatment unit processes shall be provided with one of the following reliability features:

- (a) Alarm and multiple biological treatment units capable of producing oxidized wastewater with one unit not in operation.
- (b) Alarm, short-term retention or disposal provisions, and standby replacement equipment.
- (c) Alarm and long-term storage or disposal provisions.
- (d) Automatically actuated long-term storage or disposal provisions.

§60347. Secondary sedimentation.

All secondary sedimentation unit processes shall be provided with one of the following reliability features:

- (a) Multiple sedimentation units capable of treating the entire flow with one unit not in operation.
- (b) Standby sedimentation unit process.
- (c) Long-term storage or disposal provisions.

§60349. Coagulation.

(a) All coagulation unit processes shall be provided with the following mandatory features for uninterrupted coagulant feed:

- (1) Standby feeders,
- (2) Adequate chemical stowage and conveyance facilities,
- (3) Adequate reserve chemical supply, and
- (4) Automatic dosage control.

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(b) All coagulation unit processes shall be provided with one of the following reliability features:

- (1) Alarm and multiple coagulation units capable of treating the entire flow with one unit not in operation;
- (2) Alarm, short-term retention or disposal provisions, and standby replacement equipment;
- (3) Alarm and long-term storage or disposal provisions;
- (4) Automatically actuated long-term storage or disposal provisions, or
- (5) Alarm and standby coagulation process.

§60351. Filtration.

All filtration unit processes shall be provided with one of the following reliability features:

- (a) Alarm and multiple filter units capable of treating the entire flow with one unit not in operation.
- (b) Alarm, short-term retention or disposal provisions and standby replacement equipment.
- (c) Alarm and long-term storage or disposal provisions.
- (d) Automatically actuated long-term storage or disposal provisions.
- (e) Alarm and standby filtration unit process.

§60353. Disinfection.

(a) All disinfection unit processes where chlorine is used as the disinfectant shall be provided with the following features for uninterrupted chlorine feed:

- (1) Standby chlorine supply,
- (2) Manifold systems to connect chlorine cylinders,
- (3) Chlorine scales, and
- (4) Automatic devices for switching to full chlorine cylinders. Automatic residual control of chlorine dosage, automatic measuring and recording of chlorine residual, and hydraulic performance studies may also be required.

(b) All disinfection unit processes where chlorine is used as the disinfectant shall be provided with one of the following reliability features:

- (1) Alarm and standby chlorinator;
- (2) Alarm, short-term retention or disposal provisions, and standby replacement equipment;
- (3) Alarm and long-term storage or disposal provisions;
- (4) Automatically actuated long-term storage or disposal provisions; or

NOTE: This publication is meant to be an aid to the staff of the CDPH—formerly the Department of Health Services (DHS)—Drinking Water Program and cannot be relied upon by the regulated community as the State of California’s representation of the law. The published codes are the only official representation of the law. Refer to the published codes—in this case, Title 17 and 22 CCR—whenever specific citations are required.

(5) Alarm and multiple point chlorination, each with independent power source, separate chlorinator, and separate chlorine supply.

§60355. Other alternatives to reliability requirements

Other alternatives to reliability requirements set forth in Articles 8 to 10 may be accepted if the applicant demonstrates to the satisfaction of the State Department of Health that the proposed alternative will assure an equal degree of reliability.

* * * * *

HEALTH AND SAFETY CODE RECYCLED WATER STATUES

The published codes are the only official representation of the law.

Statutes Related to Recycled Water & the California Department of Public Health

January 2011

On July 1, 2007, the California Department of Public Health (CDPH) was created and took over the duties, powers, purposes, functions, responsibilities, and jurisdiction of the California Department of Health Services, pursuant to Health and Safety Code Section 131051, et seq., which is not included in this compilation of recycled water-related statutes. Updates or inclusions since the January 1, 2009 version are highlighted in yellow. Portions that became effective upon the Governor’s approval and Secretary of State’s filing, as a result of 2010 legislative action, have also been underlined.

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HEALTH AND SAFETY CODE

DIVISION 6. SANITARY DISTRICTS

Part 1. Sanitary District Act of 1923

Chapter 4. District Powers

Article 1. General

§6512. Authority Pertaining to Water Recycling and Distribution Systems

(a) A district may acquire, plan, construct, reconstruct, alter, enlarge, lay, renew, replace, maintain, and operate garbage dumpsites and garbage collection and disposal systems, sewers, drains, septic tanks, and sewerage collection, outfall, treatment works and other sanitary disposal systems, and storm water drains and storm water collection, outfall and disposal systems, and water recycling and distribution systems, as the board deems necessary and proper, and in the performance of these functions, either in or out of the district, it may join through joint powers agreements pursuant to the provisions of Chapter 5 (commencing with Section 6500) of Division 7 of Title 1 of the Government Code, or through other means with any county or municipality or any other district or governmental agency.

(b) Before any garbage dump is established, the location shall first be approved by the county health officer, and, in addition, if the location is within two miles of any city, the consent of the governing body of the city shall first be secured.

(c)

(1) If the district includes any part of a city, water district, or other local agency that provides water service to any territory in the district, the district shall not supply water service to the territory unless the district first obtains the consent of the city, water district, or other local agency. The consent shall not be revoked, if the revocation will result in a decrease of the revenues available to pay the outstanding bonds of the district.

(2) Paragraph (1) does not apply to the provision of recycled water by a district.

(3)

(A) Subject to subparagraph (B), a district may not supply water service using recycled water to the territory of any part of a city, water district, or other local public entity providing water service, or commence construction of facilities for that service, prior to offering to consult with that city, water district, or other local public entity, and providing notification of availability for consultation. The obligation to consult terminates if that local public entity

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providing water service fails to make itself available for consultation within 60 days of written notification to that local public entity.

(B) The consultation and notification requirements described in subparagraph (A) do not apply to a district if the district, prior to supplying water or commencing construction as described in subparagraph (A), provides notification to the local public entity pursuant to Section 65604 of the Government Code or submits a written request to the local public entity pursuant to subdivision (b) of Section 13580 of the Water Code.

(d) The Department of Water Resources may assist sanitary districts in applying for, and in obtaining approval of, federal and state funding and permits for cost-effective water recycling projects and shall confer and cooperate with the legislative body of the district during the application and approval process.

DIVISION 13. HOUSING

Part 1.5. Regulations of Buildings Used for Human Habitation.

Chapter 5. Administration and Enforcement

Article 3. Actions and Proceedings

§17922.12. Use of Graywater

(a) For the purposes of this section, "graywater" means untreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes. "Graywater" includes wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines, and laundry tubs, but does not include wastewater from kitchen sinks or dishwashers.

(b) Notwithstanding Chapter 22 (commencing with Section 14875) of Division 7 of the Water Code, at the next triennial building standards rulemaking cycle that commences on or after January 1, 2009, the department shall adopt and submit for approval pursuant to Chapter 4 (commencing with Section 18935) of Part 2.5 building standards for the construction, installation, and alteration of graywater systems for indoor and outdoor uses.

(c) In adopting building standards under this section, the department shall do all of the following:

(1) Convene and consult a stakeholder's group that includes members with expertise in public health, water quality, geology or soils, residential plumbing, home building, and environmental stewardship.

(2) Ensure protection of water quality in accordance with applicable provisions of state and federal water quality law.

(3) Consider existing research available on the environmental consequences to soil and groundwater of short-term and long-term graywater use for irrigation purposes, including, but not limited to, research sponsored by the Water Environment Research Foundation.

(4) Consider graywater use impacts on human health.

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(5) Consider the circumstances under which the use of in-home graywater treatment systems is recommended.

(6) Consider the use and regulation of graywater in other jurisdictions within the United States and in other nations.

(d) The department may revise and update the standards adopted under this section at any time, and the department shall reconsider these standards at the next triennial rulemaking that commences after their adoption.

(e) The approval by the California Building Standards Commission of the standards for graywater systems adopted under this section shall terminate the authority of the Department of Water Resources to adopt and update standards for the installation, construction, and alteration of graywater systems in residential buildings pursuant to Chapter 22 (commencing with Section 14875) of Division 7 of the Water Code.

Part 2.5. State Building Standards

Chapter 4. The California Building Standards Code

§18941.7. Authority for Local Agencies to adopt graywater prohibitions or standards

A city, county, or other local agency may adopt, after a public hearing and enactment of an ordinance or resolution, building standards that prohibit entirely the use of graywater, or building standards that are more restrictive than the graywater building standards adopted by the department under Section 17922.12 and published in the California Building Standards Code.

DIVISION 104. ENVIRONMENTAL HEALTH SERVICES

Part 12. Drinking Water

Chapter 4. California Safe Drinking Water Act

Article 7. Requirements and Compliance

§116551. Augmentation of source with recycled water

The department shall not issue a permit to a public water system or amend a valid existing permit for the use of a reservoir as a source of supply that is directly augmented with recycled water, as defined in subdivision (n) of Section 13050 of the Water Code, unless the department does all of the following:

(a) Performs an engineering evaluation that evaluates the proposed treatment technology and finds that the proposed technology will ensure that the recycled water meets or exceeds all applicable primary and secondary drinking water standards and poses no significant threat to public health.

(b) Hold at least three duly noticed public hearings in the area where the recycled water is proposed to be used or supplied for human consumption to receive public testimony on that proposed use. The department shall make available to the public, not less than 10 days prior to the

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date of the first hearing held pursuant to this subdivision, the evaluations and findings made pursuant to subdivision (a).

Chapter 5. Water Equipment and Control

Article 2. Cross-Connection Control by Water Users

§116800. Control of users

Local health officers may maintain programs for the control of cross-connections by water users, within the users' premises, where public exposure to drinking water contaminated by backflow may occur. The programs may include inspections within water users premises for the purpose of identifying cross-connection hazards and determining appropriate backflow protection. Water users shall comply with all orders, instructions, regulations, and notices from the local health officer with respect to the installation, testing, and maintenance of backflow prevention devices. The local health officer may collect fees from those water users subject to inspection to offset the costs of implementing cross-connection control programs.

§116805. Fees

(a) Local health officers may maintain programs, in cooperation with water suppliers, to protect against backflow through service connections into the public water supply, and, with the consent of the water supplier, may collect fees from the water supplier to offset the costs of implementing these programs.

(b) The fees authorized under this section and under Section 116800 shall be limited to the costs of administering these programs. At the discretion of the water supplier, the fees collected from the water supplier by the local health officer may be passed through to water users.

(c) Programs authorized under this section and Section 116800 shall be conducted in accordance with backflow protection regulations adopted by the department.

(d) Nothing in this article shall prevent a water supplier from directly charging those water users required to install backflow prevention devices for the costs of the programs authorized in this section and Section 116800.

§116810. Certification of device testers

To assure that testing and maintenance of backflow prevention devices are performed by persons qualified to do testing and maintenance, local health officers may maintain programs for certification of backflow prevention device testers. The local health officer may suspend, revoke, or refuse to renew the certificate of a tester, if, after a hearing before the local health officer or his or her designee, the local health officer or his or her designee finds that the tester has practiced fraud or deception or has displayed gross negligence or misconduct in the performance of his or her duties as a certified backflow prevention device tester. The local health officer may collect fees from certified testers to offset the cost of the certification program provided pursuant to this section. The certification standards shall be consistent with the backflow protection regulations adopted by the department.

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§116815. Purple pipe for recycled water

(a) All pipes installed above or below the ground, on and after June 1, 1993, that are designed to carry recycled water, shall be colored purple or distinctively wrapped with purple tape.

(b) Subdivision (a) shall apply only in areas served by a water supplier delivering water for municipal and industrial purposes, and in no event shall apply to any of the following:

(1) Municipal or industrial facilities that have established a labeling or marking system for recycled water on their premises, as otherwise required by a local agency, that clearly distinguishes recycled water from potable water.

(2) Water delivered for agricultural use.

(c) For purposes of this section, "recycled water" has the same meaning as defined in subdivision (n) of Section 13050 of the Water Code.

§116820. Violations

Any person who violates any provision of this article, violates any order of the local health officer pursuant to this article, or knowingly files a false statement or report required by the local health officer pursuant to this article is guilty of a misdemeanor punishable by a fine not exceeding five hundred dollars (\$500) or by imprisonment not exceeding 30 days in the county jail or by both such fine and imprisonment. Each day of a violation of any provision of this article or of any order of the local health officer beyond the time stated for compliance of the order shall be a separate offense.

WATER CODE

DIVISION 6. CONSERVATION, DEVELOPMENT, AND UTILIZATION OF STATE WATER RESOURCES

Part 2.6. Urban Water Management Planning

Chapter 1. General Declaration and Policy

§10610. Urban Water Management Planning Act

This part shall be known and may be cited as the "Urban Water Management Planning Act."

§10610.2. Legislative Findings

(a) The Legislature finds and declares all of the following:

(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.

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(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.

(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

§10610.4. Legislative Findings

The Legislature finds and declares that it is the policy of the state as follows:

(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.

(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.

(c) Urban water suppliers shall be required to develop water management plans to actively pursue the efficient use of available supplies.

Chapter 2. Definitions

§10611. Definitions

Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

§10611.5. Demand management

"Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

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§10612. Customer

"Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

§10613. Efficient use

"Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

§10614. Person

"Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

§10615. Plan

"Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

§10616. Public agency

"Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

§10616.5. Recycled water

"Recycled water" means the reclamation and reuse of wastewater for beneficial use.

§10617. Urban water supplier

"Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

Chapter 3. Urban Water Management Plans

Article 1. General Provisions

§10620. Requirement for Urban Water Management Plan

(a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

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(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d)

(1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

§10621. Plan Updates

(a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

Article 2. Contents of Plans

§10630. Legislative intent

It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

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§10631. Requirements for plan

A plan shall be adopted in accordance with this chapter and shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c)

(1) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(A) An average water year.

(B) A single dry water year.

(C) Multiple dry water years.

(2) For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

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(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(e)

(1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses:

- (A) Single-family residential.
- (B) Multifamily.
- (C) Commercial.
- (D) Industrial.
- (E) Institutional and governmental.
- (F) Landscape.
- (G) Sales to other agencies.
- (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

(A) Water survey programs for single-family residential and multifamily residential customers.

(B) Residential plumbing retrofit.

(C) System water audits, leak detection, and repair.

(D) Metering with commodity rates for all new connections and retrofit of existing connections.

(E) Large landscape conservation programs and incentives.

(F) High-efficiency washing machine rebate programs.

(G) Public information programs.

(H) School education programs.

(I) Conservation programs for commercial, industrial, and institutional accounts.

(J) Wholesale agency programs.

(K) Conservation pricing.

(L) Water conservation coordinator.

(M) Water waste prohibition.

(N) Residential ultra-low-flush toilet replacement programs.

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

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(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

(2) Include a cost-benefit analysis, identifying total benefits and total costs.

(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

(j) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to that council in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).

(k) Urban water suppliers that rely upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency

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shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

§10631.1. Water Use Projections

(a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

(b) It is the intent of the Legislature that the identification of projected water use for single-family and multifamily residential housing for lower income households will assist a supplier in complying with the requirement under Section 65589.7 of the Government Code to grant a priority for the provision of service to housing units affordable to lower income households.

§10631.5. Grants and Loans

(a)

(1) Beginning January 1, 2009, the terms of, and eligibility for, a water management grant or loan made to an urban water supplier and awarded or administered by the department, state board, or California Bay-Delta Authority or its successor agency shall be conditioned on the implementation of the water demand management measures described in Section 10631, as determined by the department pursuant to subdivision (b).

(2) For the purposes of this section, water management grants and loans include funding for programs and projects for surface water or groundwater storage, recycling, desalination, water conservation, water supply reliability, and water supply augmentation. This funding includes, but is not limited to, funds made available pursuant to Section 75026 of the Public Resources Code.

(3) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if the urban water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the water demand management measures. The supplier may request grant or loan funds to implement the water demand management measures to the extent the request is consistent with the eligibility requirements applicable to the water management funds.

(4)

(A) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if an urban water supplier submits to the department for approval documentation demonstrating that a

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water demand management measure is not locally cost effective. If the department determines that the documentation submitted by the urban water supplier fails to demonstrate that a water demand management measure is not locally cost effective, the department shall notify the urban water supplier and the agency administering the grant or loan program within 120 days that the documentation does not satisfy the requirements for an exemption, and include in that notification a detailed statement to support the determination.

(B) For purposes of this paragraph, "not locally cost effective" means that the present value of the local benefits of implementing a water demand management measure is less than the present value of the local costs of implementing that measure.

(b)

(1) The department, in consultation with the state board and the California Bay-Delta Authority or its successor agency, and after soliciting public comment regarding eligibility requirements, shall develop eligibility requirements to implement the requirement of paragraph (1) of subdivision (a). In establishing these eligibility requirements, the department shall do both of the following:

(A) Consider the conservation measures described in the Memorandum of Understanding Regarding Urban Water Conservation in California, and alternative conservation approaches that provide equal or greater water savings.

(B) Recognize the different legal, technical, fiscal, and practical roles and responsibilities of wholesale water suppliers and retail water suppliers.

(2)

(A) For the purposes of this section, the department shall determine whether an urban water supplier is implementing all of the water demand management measures described in Section 10631 based on either, or a combination, of the following:

(i) Compliance on an individual basis.

(ii) Compliance on a regional basis. Regional compliance shall require participation in a regional conservation program consisting of two or more urban water suppliers that achieves the level of conservation or water efficiency savings equivalent to the amount of conservation or savings achieved if each of the participating urban water suppliers implemented the water demand management measures. The urban water supplier administering the regional program shall provide participating urban water suppliers and the department with data to demonstrate that the regional program is consistent with this clause. The department shall review the data to determine whether the urban water suppliers in the regional program are meeting the eligibility requirements.

(B) The department may require additional information for any determination pursuant to this section.

(3) The department shall not deny eligibility to an urban water supplier in compliance with the requirements of this section that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of the agencies participating in the project or plan is not implementing all of the water demand management measures described in Section 10631.

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(c) In establishing guidelines pursuant to the specific funding authorization for any water management grant or loan program subject to this section, the agency administering the grant or loan program shall include in the guidelines the eligibility requirements developed by the department pursuant to subdivision (b).

(d) Upon receipt of a water management grant or loan application by an agency administering a grant and loan program subject to this section, the agency shall request an eligibility determination from the department with respect to the requirements of this section. The department shall respond to the request within 60 days of the request.

(e) The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities. In addition, for urban water suppliers that are signatories to the Memorandum of Understanding Regarding Urban Water Conservation in California and submit biennial reports to the California Urban Water Conservation Council in accordance with the memorandum, the department may use these reports to assist in tracking the implementation of water demand management measures.

§10631.7. Independent Technical Panel

The department, in consultation with the California Urban Water Conservation Council, shall convene an independent technical panel to provide information and recommendations to the department and the Legislature on new demand management measures, technologies, and approaches. The panel shall consist of no more than seven members, who shall be selected by the department to reflect a balanced representation of experts. The panel shall have at least one, but no more than two, representatives from each of the following: retail water suppliers, environmental organizations, the business community, wholesale water suppliers, and academia. The panel shall be convened by January 1, 2009, and shall report to the Legislature no later than January 1, 2010, and every five years thereafter. The department shall review the panel report and include in the final report to the Legislature the department's recommendations and comments regarding the panel process and the panel's recommendations.

§10632. Water Shortage Contingency

The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

(a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

(b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

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(c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

(d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

(e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

(f) Penalties or charges for excessive use, where applicable.

(g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

(h) A draft water shortage contingency resolution or ordinance.

(i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

§10633. Information on recycled water

The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

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(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

§10634. Quantity of Sources

The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

Article 2.5 Water Service Reliability

§10635. Assessment of water reliability

(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

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Article 3. Adoption and Implementation of Plans

§10640. Requirements for urban water supplier

Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630).

The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

§10641. Consultation with agencies

An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

§10642. Encouraging community participation

Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

§10643. Implementation

An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

§10644. Submission of plan

(a) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(b) The department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part. The report prepared by the department shall identify the exemplary elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has submitted its plan to the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

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(c)

(1) For the purpose of identifying the exemplary elements of the individual plans, the department shall identify in the report those water demand management measures adopted and implemented by specific urban water suppliers, and identified pursuant to Section 10631, that achieve water savings significantly above the levels established by the department to meet the requirements of Section 10631.5.

(2) The department shall distribute to the panel convened pursuant to Section 10631.7 the results achieved by the implementation of those water demand management measures described in paragraph (1).

(3) The department shall make available to the public the standard the department will use to identify exemplary water demand management measures.

§10645. Availability for public review.

Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

Chapter 4. Miscellaneous Provisions

§10650. Commencement of actions

Any actions or proceedings to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 90 days after filing of the plan or amendment thereto pursuant to Section 10644 or the taking of that action.

§10651. Extent of actions

In any action or proceeding to attack, review, set aside, void, or annul a plan, or an action taken pursuant to the plan by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

§10652. CEQA Exemption

The California Environmental Quality Act (Division 13) (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

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§10653. Adoption of Plan and legal requirements

The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the State Water Resources Control Board and the Public Utilities Commission, for the preparation of water management plans or conservation plans; provided, that if the State Water Resources Control Board or the Public Utilities Commission requires additional information concerning water conservation to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan prepared to meet federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

§10654. Cost recovery.

An urban water supplier may recover in its rates the costs incurred in preparing its plan and implementing the reasonable water conservation measures included in the plan. Any best water management practice that is included in the plan that is identified in the "Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section.

§10655. Invalidation of any provisions

If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

§10656. Failure to produce a plan

An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (commencing with Section 78500) or Division 26 (commencing with Section 79000), or receive drought assistance from the state until the urban water management plan is submitted pursuant to this article.

DIVISION 7. WATER QUALITY

Chapter 2. Definitions

§13050. Terms used in this division

As used in this division:

(a) "State board" means the State Water Resources Control Board.

(b) "Regional board" means any California regional water quality control board for a region as specified in Section 13200.

(c) "Person" includes any city, county, district, the state, and the United States, to the extent authorized by federal law.

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(d) "Waste" includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal.

(e) "Waters of the state" means any surface water or groundwater, including saline waters, within the boundaries of the state.

(f) "Beneficial uses" of the waters of the state that may be protected against quality degradation include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.

(g) "Quality of the water" refers to chemical, physical, biological, bacteriological, radiological, and other properties and characteristics of water which affect its use.

(h) "Water quality objectives" means the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area.

(i) "Water quality control" means the regulation of any activity or factor which may affect the quality of the waters of the state and includes the prevention and correction of water pollution and nuisance.

(j) "Water quality control plan" consists of a designation or establishment for the waters within a specified area of all of the following:

- (1) Beneficial uses to be protected.
- (2) Water quality objectives.
- (3) A program of implementation needed for achieving water quality objectives.

(k) "Contamination" means an impairment of the quality of the waters of the state by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. "Contamination" includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected.

(l)

(1) "Pollution" means an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects either of the following:

- (A) The waters for beneficial uses.
 - (B) Facilities which serve these beneficial uses.
- (2) "Pollution" may include "contamination."

(m) "Nuisance" means anything which meets all of the following requirements:

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(1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property.

(2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.

(3) Occurs during, or as a result of, the treatment or disposal of wastes.

(n) "Recycled water" means water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is therefore considered a valuable resource.

(o) "Citizen or domiciliary" of the state includes a foreign corporation having substantial business contacts in the state or which is subject to service of process in this state.

(p)

(1) "Hazardous substance" means either of the following:

(A) For discharge to surface waters, any substance determined to be a hazardous substance pursuant to Section 311(b)(2) of the Federal Water Pollution Control Act (33 U.S.C. Sec. 1251 et seq.).

(B) For discharge to groundwater, any substance listed as a hazardous waste or hazardous material pursuant to Section 25140 of the Health and Safety Code, without regard to whether the substance is intended to be used, reused, or discarded, except that "hazardous substance" does not include any substance excluded from Section 311 (b)(2) of the Federal Water Pollution Control Act because it is within the scope of Section 311(a)(1) of that act.

(2) "Hazardous substance" does not include any of the following:

(A) Nontoxic, nonflammable, and noncorrosive stormwater runoff drained from underground vaults, chambers, or manholes into gutters or storm sewers.

(B) Any pesticide which is applied for agricultural purposes or is applied in accordance with a cooperative agreement authorized by Section 116180 of the Health and Safety Code, and is not discharged accidentally or for purposes of disposal, the application of which is in compliance with all applicable state and federal laws and regulations.

(C) Any discharge to surface water of a quantity less than a reportable quantity as determined by regulations issued pursuant to Section 311(b)(4) of the Federal Water Pollution Control Act.

(D) Any discharge to land which results, or probably will result, in a discharge to groundwater if the amount of the discharge to land is less than a reportable quantity, as determined by regulations adopted pursuant to Section 13271, for substances listed as hazardous pursuant to Section 25140 of the Health and Safety Code. No discharge shall be deemed a discharge of a reportable quantity until regulations set a reportable quantity for the substance discharged.

(q)

(1) "Mining waste" means all solid, semisolid, and liquid waste materials from the extraction, beneficiation, and processing of ores and minerals. Mining waste includes, but is not

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limited to, soil, waste rock, and overburden, as defined in Section 2732 of the Public Resources Code, and tailings, slag, and other processed waste materials, including cementitious materials that are managed at the cement manufacturing facility where the materials were generated.

(2) For the purposes of this subdivision, "cementitious material" means cement, cement kiln dust, clinker, and clinker dust.

(r) "Master recycling permit" means a permit issued to a supplier or a distributor, or both, of recycled water, that includes waste discharge requirements prescribed pursuant to Section 13263 and water recycling requirements prescribed pursuant to Section 13523.1.

§13051. Injection well

As used in this division, "injection well" means any bored, drilled, or driven shaft, dug pit, or hole in the ground into which waste or fluid is discharged, and any associated subsurface appurtenances, and the depth of which is greater than the circumference of the shaft, pit, or hole.

Chapter 3. State Water Quality Control

Article 4. Other Powers and Duties of the State Board

§13169. Groundwater protection program

(a) The state board is authorized to develop and implement a groundwater protection program as provided under the Safe Drinking Water Act, Section 300 and following of Title 42 of the United States Code, and any federal act that amends or supplements the Safe Drinking Water Act. The authority of the state board under this section includes, but is not limited to, the following:

(1) To apply for and accept state groundwater protection grants from the federal government.

(2) To take any additional action as may be necessary or appropriate to assure that the state's groundwater protection program complies with any federal regulations issued pursuant to the Safe Drinking Water Act or any federal act that amends or supplements the Safe Drinking Water Act.

(b) Nothing in this section is intended to expand the authority of the state board as authorized under the Porter-Cologne Water Quality Control Act (Div. 7 (commencing with Sec. 13000) Wat. C.).

§13176. Laboratory analyses

(a) The analysis of any material required by this division shall be performed by a laboratory that has accreditation or certification pursuant to Article 3 (commencing with Section 100825) of Chapter 4 of Part 1 of Division 101 of the Health and Safety Code.

(b) A person or public entity of the state shall not contract with a laboratory for environmental analyses for which the State Department of Public Health requires accreditation or certification pursuant to this chapter, unless the laboratory holds a valid certification or accreditation.

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Chapter 4. Regional Water Quality Control

Article 4. Waste Discharge Requirements

§13275. Public water system rights

(a) Notwithstanding any other law, a public water system regulated by the State Department of Public Health shall have the same legal rights and remedies against a responsible party, when the water supply used by that public water system is contaminated, as those of a private land owner whose groundwater has been contaminated.

(b) For purposes of this section, “responsible party” has the same meaning as defined in Section 25323.5 of the Health and Safety Code.

Chapter 5. Enforcement and Implementation

Article 1. Administrative Enforcement and Remedies by the Regional Boards

§13304.1. Discharges of treated groundwater – CDPH role (as amended effective January 1, 2011)

(a) A groundwater cleanup system that commences operation on or after January 1, 2002, and that is required to obtain a discharge permit from the regional board pursuant to the regional board’s jurisdiction, and that discharges treated groundwater to surface water or groundwater, shall treat the groundwater to standards approved by the regional board, consistent with this division and taking into account the beneficial uses of the receiving water and the location of the discharge and the method by which the discharge takes place.

(b) In making its determination of the applicable water quality standards to be achieved by the operator of a groundwater cleanup system that commences operation on or after January 1, 2002, that draws groundwater from an aquifer that is currently being used, or has been used at any time since 1979 as a source of drinking water supply by the owner or operator of a public water system, and that discharges treated groundwater to surface water or groundwater from which a public water system draws drinking water, the regional board shall consult with the affected groundwater management entity, if any, affected public water systems, and the State Department of Public Health to ensure that the discharge, spreading, or injection of the treated groundwater will not adversely affect the beneficial uses of any groundwater basin or surface water body that is or may be used by a public water system for the provision of drinking water.

Chapter 6. Financial Assistance

Article 1. State Water Quality Control Fund

§13400. Definitions

As used in this chapter, unless otherwise apparent from the context:

(a) "Fund" means the State Water Quality Control Fund.

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(b) "Public agency" means any city, county, city and county, district, or other political subdivision of the state.

(c) "Facilities" means:

- (1) facilities for the collection, treatment, or export of waste when necessary to prevent water pollution,
- (2) facilities to recycle wastewater and to convey recycled water,
- (3) facilities or devices to conserve water, or
- (4) any combination of the foregoing.

§13401. Fund's continuing existence

(a) The State Water Quality Control Fund is continued in existence. The following moneys in the fund are appropriated, without regard to fiscal years, for expenditure by the state board in making loans to public agencies in accordance with this chapter:

- (1) The balance of the original moneys deposited in the fund.
- (2) Any money repaid to the fund.
- (3) Any remaining balance of the money in the fund deposited therein after the specific appropriations for loans to the South Tahoe Public Utility District, the North Tahoe Public Utility District, the Tahoe City Public Utility District, the Truckee Sanitary District, and to any other governmental entity in the areas served by such districts have been made.

(b) Notwithstanding subdivision (a), upon the order of the state board, the money in the State Water Quality Control Fund shall be transferred to the State Water Pollution Control Revolving Fund.

Article 2. Loans to Local Agencies

§13410. Applications

Applications for construction loans under this chapter shall include:

- (a) A description of the proposed facilities.
- (b) A statement of facts showing the necessity for the proposed facilities and showing that funds of the public agency are not available for financing such facilities and that the sale of revenue or general obligation bonds through private financial institutions is impossible or would impose an unreasonable burden on the public agency.
- (c) A proposed plan for repaying the loan.
- (d) Other information as required by the state board.

§13411. DHS consultation

Upon a determination by the state board, after consultation with the State Department of Health, that

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(a) the facilities proposed by an applicant are necessary to the health or welfare of the inhabitants of the state,

(b) that the proposed facilities meet the needs of the applicant,

(c) that funds of the public agency are not available for financing such facilities and that the sale of revenue or general obligation bonds through private financial institutions is impossible or would impose an unreasonable burden on the public agency,

(d) that the proposed plan for repayment is feasible,

(e) in the case of facilities proposed under Section 13400(c)(1) that such facilities are necessary to prevent water pollution,

(f) in the case of facilities proposed under Section 13400(c)(2) that such facilities will produce recycled water and that the public agency has adopted a feasible program for use thereof, and

(g) in the case of facilities proposed under Section 13400(c)(3) that such facilities are a cost effective means of conserving water, the state board, subject to approval by the Director of Finance, may loan to the applicant such sum as it determines is not otherwise available to the public agency to construct the proposed facilities.

§13412. Repayment

No loan shall be made to a public agency unless it executes an agreement with the state board under which it agrees to repay the amount of the loan, with interest, within 25 years at 50 percent of the average interest rate paid by the state on general obligation bonds sold in the calendar year immediately preceding the year in which the loan agreement is executed.

§13413. Construction halted under health department orders

It is the policy of this state that, in making construction loans under this article, the state board should give special consideration to facilities proposed to be constructed by public agencies in areas in which further construction of buildings has been halted by order of the State Department of Health or a local health department, or both, or notice has been given that such an order is being considered; provided, however, that the public agencies designated in this section shall otherwise comply with and meet all requirements of other provisions of this chapter.

§13414. Funding monies repaid

All money received in repayment of loans under this chapter shall be paid to the State Treasurer and credited to the fund.

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§13415. Loans for studies and investigations

(a) Loans may be made by the state board to public agencies to pay not more than one half of the cost of studies and investigations made by such public agencies in connection with waste water reclamation.

(b) Not more than a total of two hundred thousand dollars (\$200,00) shall be loaned pursuant to this section in any fiscal year, and not more than fifty thousand dollars (\$50,000) shall be loaned to any public agency in any fiscal year pursuant to this section. In the event that less than two million dollars (\$2,000,000) is available in any fiscal year for loans under this article, then not more than 10 percent of the available amount shall be available for loans for studies and investigations pursuant to this section.

(c) Applications for such loans shall be made in such form, and shall contain such information, as may be required by the state board.

(d) Such loans shall be repaid within a period not to exceed 10 years, with interest at a rate established in the manner provided in Section 13412.

§13416. Election required to enter into loan contract

Before a public agency may enter into a contract with the state board for a construction loan under this chapter, the public agency shall hold an election on the proposition of whether or not the public agency shall enter into the proposed contract and more than 50 percent of the votes cast at such election must be in favor of such proposition.

§13417. Election procedure

The election shall be held in accordance with the following provisions:

(a) The procedure for holding an election on the incurring of bonded indebtedness by such public agency shall be utilized for an election of the proposed contract as nearly as the same may be applicable. Where the law applicable to such agency does not contain such bond election procedure, the procedure set forth in the Revenue Bond Law of 1941 (Chapter 6 (commencing with Section 54300) Part 1, Division 2, Title 5 of the Government Code), as it may now or hereafter be amended, shall be utilized as nearly as the same may be applicable.

(b) No particular form of ballot is required.

(c) The notice of the election shall include a statement of the time and place of the election, the purpose of the election, the general purpose of the contract, and the maximum amount of money to be borrowed from the state under the contract.

(d) The ballots for the election shall contain a brief statement of the general purpose of the contract substantially as stated in the notice of the election, shall state the maximum amount of money to be borrowed from the state under the contract, and shall contain the words "Execution of contract --Yes" and "Execution of contract--No."

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(e) The election shall be held in the entire public agency except where the public agency proposes to contract with the state board on behalf of a specified portion, or of specified portions of the public agency, in which case the election shall be held in such portion or portions of the public agency only.

§13418. Tahoe moratorium

Notwithstanding any provision of this chapter or any other provision of law, including, but not limited to, the provisions of Chapter 47 and 137 of the Statutes of 1966, First Extraordinary Session, Chapter 1679 of the Statutes of 1967, Chapter 1356 of the Statutes of 1969, and Chapter 920 of the Statutes of 1970, or the provisions of any existing loan contract entered into pursuant to this chapter or any other such provision of law, there shall be a two-year moratorium following the effective date of this section on that portion of the principal and interest payments otherwise required in repayment of funds heretofore loaned to the North Tahoe Public Utility District, the Tahoe City Public Utility District, the South Tahoe Public Utility District, the Truckee Sanitary District, the Squaw Valley County Water District, and the Alpine Springs County Water District pursuant to this chapter or any act of the Legislature authorizing a state loan for the purpose of permitting any such agency to construct necessary sewage and storm drainage facilities to prevent and control water pollution in the area served by such agency, equal in percentage, as determined by the Department of Finance, to the percentage of property tax revenues lost to the agency by reason of the adoption of Article XIII A of the California Constitution, unless moneys are otherwise available for such repayment from state allocations or the sale of bonds authorized on or before July 1, 1978, but unissued. The provisions of this section do not apply to any sums which are required to be repaid immediately or in accordance with an accelerated time schedule pursuant to a duly entered stipulated judgment between the State of California and the Tahoe City Public Utility District. Interest on loans shall accrue during the moratorium period and be repaid by the recipients of the loans, in addition to the normal principal and interest payments.

Article 2.5 Local Bonds

§13425. Applications

Applications for guarantees for local agency bonds under this chapter shall include:

- (a) A description of the proposed facilities.
- (b) A financing plan for the proposed facilities, including the amount of debt and maximum term to maturity of the proposed local agency bond issue and identification of sources of revenue that will be dedicated to payment of principal and interest on the bonds.
- (c) Other information as required by the state board. The state board may provide that the application may be combined with applications for any other source of funds administered by the state board.

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§13426. Consultation with CDPH on determinations

The state board, subject to approval by the Director of Finance, may agree to provide a guarantee pursuant to this article for all or a specified part of the proposed local agency bond issue upon making, after consultation with the State Department of Public Health, all of the following determinations:

(a) The facilities proposed by an applicant are necessary to the health or welfare of the inhabitants of the state and are consistent with water quality control plans adopted by regional boards.

(b) The proposed facilities meet the needs of the applicant.

(c) The proposed bond issue and plan repayment are sound and feasible.

(d) In the case of facilities proposed under paragraph (2) of subdivision (c) of Section 13400, the facilities will produce recycled water and the applicant has adopted a feasible program for the use of the facilities. The state board may adopt criteria for ranking and setting priorities among applicants for those guarantees.

§13427. Agreement by applicant

No guarantee shall be extended to any applicant unless it executes an agreement with the state board under which the applicant agrees to the following provisions:

(a) To proceed expeditiously with, and complete, the proposed project.

(b) To commence operation of the project on completion, and to properly operate and maintain the work in accordance with applicable provisions of law.

(c) To issue bonds and to levy fines, charges, assessments, or taxes to pay the principal of, and interest on, the bonds as described in the application.

(d) To diligently and expeditiously collect those levies, including timely exercise of available legal remedies in the event of delinquency or default.

(e) To act in accordance with such other provisions as the state board may require.

§13428. Clean Water Bond Guarantee Fund

Notwithstanding Section 13340 of the Government Code, the money in the Clean Water Bond Guarantee Fund, which is hereby created, is continuously appropriated to the state board without regard to fiscal years for the purposes of this chapter.

§13429. Investment of money in fund

Money in the Clean Water Bond Guarantee Fund not needed for making payments on guaranteed bonds pursuant to this chapter shall be invested pursuant to law. All proceeds of the investment shall be deposited in that fund to the extent permitted by federal law.

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§13430. Limitation on authorization to guarantee bonds

The state board's authorization to guarantee bonds under this article shall be limited to bonds with a total principal amount of not more than 10 times the amount in the Clean Water Bond Guarantee Fund at the time the state board determines to extend each guarantee pursuant to Section 13426.

§13431. Limitation on amounts paid

Under no circumstances shall the amount paid out as a result of bond guarantees extended pursuant to this article exceed the amount in the Clean Water Bond Guarantee Fund. This article does not express or imply any commitment by the state board or any other agency of the state to pay any money or levy any charge or tax or otherwise exercise its faith and credit on behalf of any local agency or bondholder beyond the funds in the Clean Water Bond Guarantee Fund.

§13432. Annual Fee

The state board may charge an annual fee not to exceed one-tenth of 1 percent of the principal amount of each bond issue that it guarantees for guarantee coverage. The state board may charge a lesser amount. The proceeds of any fee shall be paid into the Clean Water Bond Guarantee Fund.

§13433. Rules and procedures authority

The state board shall, by regulation, prescribe rules and procedures for all of the following:

(a) To pay money from the Clean Water Bond Guarantee Fund to an insured local agency or bondholder in the event that the amount in the local agency's bond reserve fund falls below a minimum amount, or in the event of failure by the local agency to pay the principal of, or interest on, an insured bond issue on time, as the state board may require.

(b) To require, by court action if necessary, a local agency to raise sewer service charges, levy additional assessments, collect charges or assessments, or foreclose or otherwise sell property as needed to prevent a reduction in the local agency's bond reserve fund, or to prevent default, or to collect funds to repay to the fund any payments made pursuant to subdivision (a).

Article 3. State Water Pollution Cleanup and Abatement Account

§13440. Fund established

There is in the State Water Quality Control Fund the State Water Pollution Cleanup and Abatement Account (hereinafter called the "account"), to be administered by the state board.

§13441. Sources of payment into account; availability for expenditure

There is to be paid into the account all moneys from the following sources:

(a) All moneys appropriated by the Legislature for the account.

(b) All moneys contributed to the account by any person and accepted by the state board.

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(c) One-half of all moneys collected by way of criminal penalty and all moneys collected civilly under any proceeding brought pursuant to any provision of this division.

(d) All moneys collected by the state board for the account under Section 13304. The first unencumbered five hundred thousand dollars (\$500,000) paid into the account in any given fiscal year is available without regard to fiscal years, for expenditure by the state board in accordance with the provisions of this article. The next unencumbered five hundred thousand dollars (\$500,000), or any portion thereof, deposited in any given fiscal year, is available for expenditure by the state board for the purposes of this article, subject to the provisions set forth in Section 28 of the Budget Act of 1984 (Chapter 258 of the Statutes of 1984). The next unencumbered one million dollars (\$1,000,000) deposited in the account in any given fiscal year is available for expenditure by the state board for the purposes of Section 13443. The remaining unencumbered funds deposited in the account in any given fiscal year is available without regard to fiscal years to the state board for expenditure for the purposes set forth in Section 13442.

§13441.5. Loans from fund to account

The State Treasurer, when requested by the state board and approved by the Director of Finance, shall transfer moneys in the nature of a loan from the State Water Quality Control Fund to the account created pursuant to Section 13440, which shall be repayable from the account to such fund; provided, that the moneys transferred from the fund to the account shall not exceed the sum of twenty-five thousand dollars (\$25,000) at any one time.

§13442. Use of monies to assist in clean-up

Upon application by a public agency with authority to clean up a waste or abate the effects thereof, the state board may order moneys to be paid from the account to the agency to assist it in cleaning up the waste or abating its effects on waters of the state. The agency shall not become liable to the state board for repayment of such moneys, but this shall not be any defense to an action brought pursuant to subdivision (c) of Section 13304 for the recovery of moneys paid hereunder.

§13443. Use of money for unforeseen water pollution

Upon application by a regional board that is attempting to remedy a significant unforeseen water pollution problem, posing an actual or potential public health threat, and for which the regional board does not have adequate resources budgeted, the state board may order moneys to be paid from the account to the regional board to assist it in responding to the problem.

Chapter 7 Reclamation

Article 1. Title

§13500. Title

This chapter shall be known as and may be cited as the Water Recycling Law.

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Article 2. Legislative Findings and Intent

§13510. Public interest

It is hereby declared that the people of the state have a primary interest in the development of facilities to recycle water containing waste to supplement existing surface and underground water supplies and to assist in meeting the future water requirements of the state.

§13511. Findings

The Legislature finds and declares that a substantial portion of the future water requirements of this state may be economically met by beneficial use of recycled water. The Legislature further finds and declares that the utilization of recycled water by local communities for domestic, agricultural, industrial, recreational, and fish and wildlife purposes will contribute to the peace, health, safety and welfare of the people of the state. Use of recycled water constitutes the development of "new basic water supplies" as that term is used in Chapter 5 (commencing with Section 12880) of Part 6 of Division 6.

§13512. Legislative intention

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 requirements of the state.

Article 3. Financial Assistance

§13515. Authority to loan

In order to implement the policy declarations of this chapter, the state board is authorized to provide loans for the development of water reclamation facilities, or for studies and investigations in connection with water reclamation, pursuant to the provisions of Chapter 6 (commencing with Section 13400) of this division.

Article 4. Regulation of Reclamation

§13520. Recycling criteria

As used in this article "recycling criteria" are the levels of constituents of recycled water, and means for assurance of reliability under the design concept which will result in recycled water safe from the standpoint of public health, for the uses to be made.

§13521. CDPH establishes recycling criteria

The State Department of **Public** Health shall establish uniform statewide recycling criteria for each varying type of use of recycled water where the use involves the protection of public health.

§13522. Abatement by CDPH or local health officer

(a) If the State Department of **Public** Health or a local health officer finds that a contamination exists as a result of the use of recycled water, the department or local health officer shall order the contamination abated in accordance with the procedure provided for in

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Chapter 6 (commencing with Section 5400) of Part 3 of Division 5 of the Health and Safety Code.

(b) The use of recycled water in accordance with the uniform statewide recycling criteria established pursuant to Section 13521, for the purpose of this section, does not cause, constitute, or contribute to, any form of contamination, unless the department or the regional board determines that contamination exists.

§13522.5. Reports

(a) Except as provided in subdivision (e), any person recycling or proposing to recycle water, or using or proposing to use recycled water, within any region for any purpose for which recycling criteria have been established, shall file with the appropriate regional board a report containing information required by the regional board.

(b) Except as provided in subdivision (e), every person recycling water or using recycled water shall file with the appropriate regional board a report of any material change or proposed change in the character of the recycled water or its use.

(c) Each report under this section shall be sworn to, or submitted under penalty of perjury.

(d) This section shall not be construed so as to require any report in the case of any producing, manufacturing, or processing operation involving the recycling of water solely for use in the producing, manufacturing, or processing operation.

(e) Except upon the written request of the regional board, a report is not required pursuant to this section from any user of recycled water which is being supplied by a supplier or distributor for whom a master recycling permit has been issued pursuant to Section 13523.1.

§13522.6. Failure to report

Any person failing to furnish a report under Section 13522.5 when so requested by a regional board is guilty of a misdemeanor.

§13522.7. Injunction

The Attorney General, at the request of the regional board, shall petition the superior court for the issuance of a temporary restraining order, temporary injunction or permanent injunction, or combination thereof, as may be appropriate, requiring any person not complying with Section 13522.5 to comply forthwith.

§13523. CDPH recommendation requirement

(a) Each regional board, after consulting with and receiving the recommendations of the State Department of **Public** Health and any party who has requested in writing to be consulted, and after any necessary hearing, shall, if in the judgment of the board, it is necessary to protect the public health, safety, or welfare, prescribe water reclamation requirements for water that is used or proposed to be used as recycled water.

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(b) The requirements may be placed upon the person recycling water, the user, or both. The requirements shall be established in conformance with the uniform statewide recycling criteria established pursuant to Section 13521. The regional board may require the submission of a preconstruction report for the purpose of determining compliance with the uniform statewide recycling criteria. The requirements for a use of recycled water not addressed by the uniform statewide recycling criteria shall be considered on a case-by-case basis.

§13523.1. Master permit requirements

(a) Each regional board, after consulting with, and receiving the recommendations of, the State Department of Public Health and any party who has requested in writing to be consulted, with the consent of the proposed permittee, and after any necessary hearing, may, in lieu of issuing waste discharge requirements pursuant to Section 13263 or water recycling requirements pursuant to Section 13523 for a user of recycled water, issue a master recycling permit to a supplier or distributor, or both, of recycled water.

(b) A master recycling permit shall include, at least, all of the following:

(1) Waste discharge requirements, adopted pursuant to Article 4 (commencing with Section 13260) of Chapter 4.

(2) A requirement that the permittee comply with the uniform statewide recycling criteria established pursuant to Section 13521. Permit conditions for a use of recycled water not addressed by the uniform statewide water recycling criteria shall be considered on a case-by-case basis.

(3) A requirement that the permittee 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 recycling criteria established pursuant to Section 13521.

(4) A requirement that the permittee submit a quarterly report 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.

(5) A requirement that the permittee conduct periodic inspections of the facilities of the recycled water users to monitor compliance by the users with the uniform statewide recycling criteria established pursuant to Section 13521 and the requirements of the master recycling permit.

(6) Any other requirements determined to be appropriate by the regional board.

§13523.5. Salinity exception

A regional board may not deny issuance of water reclamation requirements to a project which violates only a salinity standard in the basin plan.

§13524. Establishment of criteria

No person shall recycle water or use recycled water for any purpose for which recycling criteria have been established until water recycling requirements have been established pursuant to this article or a regional board determines that no requirements are necessary.

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§13525. TRO and injunction

Upon the refusal or failure of any person or persons recycling water or using recycled water to comply with the provisions of this article, the Attorney General, at the request of the regional board, shall petition the superior court for the issuance of a temporary restraining order, preliminary injunction, or permanent injunction, or combination thereof, as may be appropriate, prohibiting forthwith any person or persons from violating or threatening to violate the provisions of this article.

§13525.5. Violation

Any person recycling water or using recycled water in violation of Section 13524, after such violation has been called to his attention in writing by the regional board, is guilty of a misdemeanor. Each day of such recycling or use shall constitute a separate offense.

§13526. Misdemeanor

Any person who, after such action has been called to his attention in writing by the regional board, uses recycled water for any purpose for which recycling criteria have been established prior to the establishment of water recycling requirements, is guilty of a misdemeanor.

§13527. Priority in financial assistance

(a) In administering any statewide program of financial assistance for water pollution or water quality control which may be delegated to it pursuant to Chapter 6 (commencing with Section 13400) of this division, the state board shall give added consideration to water quality control facilities providing optimum water recycling and use of recycled water.

(b) Nothing in this chapter prevents the appropriate regional board from establishing waste discharge requirements if a discharge is involved.

§13528. CDPH powers

This chapter shall not be construed as affecting the powers of the State Department of **Public** Health.

§13529. Unauthorized discharges of recycled water

The Legislature hereby finds and declares all of the following:

(a) The purpose of Section 13529.2 is to establish notification requirements for unauthorized discharges of recycled water to waters of the state.

(b) It is the intent of the Legislature in enacting this section to promote the efficient and safe use of recycled water.

(c) The people of the state have a primary interest in the development of facilities to recycle water to supplement existing water supplies and to minimize the impacts of growing demand for new water on sensitive natural water bodies.

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(d) A substantial portion of the future water requirements of the state may be economically met by the beneficial use of recycled water.

(e) The Legislature has established a statewide goal to recycle 700,000 acre-feet of water per year by the year 2000 and 1,000,000 acre-feet of water per year by the year 2010.

(f) The use of recycled water has proven to be safe and the State Department of Health Services is drafting regulations to provide for expanded uses of recycled water.

§13529.2. Requirements if unauthorized discharge occurs

(a) Any person who, without regard to intent or negligence, causes or permits an unauthorized discharge of 50,000 gallons or more of recycled water, as defined in subdivision (c), or 1,000 gallons or more of recycled water, as defined in subdivision (d), in or on any waters of the state, or causes or permits such unauthorized discharge to be discharged where it is, or probably will be, discharged in or on any waters of the state, shall, as soon as

- (1) that person has knowledge of the discharge,
- (2) notification is possible, and
- (3) notification can be provided without substantially impeding cleanup or other emergency measures, immediately notify the appropriate regional board.

(b) For the purposes of this section, an unauthorized discharge means a discharge not authorized by waste discharge requirements pursuant to Article 4 of Chapter 4 (commencing with Section 13260), water reclamation requirements pursuant to Section 13523, a master reclamation permit pursuant to Section 13523.1, or any other provision of this division.

(c) For the purposes of this section, "recycled water" means wastewater treated as "disinfected tertiary 2.2 recycled water," as defined or described by the State Department of Health Services or wastewater receiving advanced treatment beyond disinfected tertiary 2.2 recycled water.

(d) For purposes of this section, "recycled water" means "recycled water," as defined in subdivision (n) of Section 13050, which is treated at a level less than "disinfected tertiary 2.2 recycled water," as defined or described by the State Department of Health Services.

(e) The requirements in this section supplement, and shall not supplant, any other provisions of law.

§13529.4. Penalties

(a) Any person refusing or failing to provide the notice required by Section 13529.2, or as required by a condition of waste discharge requirements requiring notification of unauthorized releases of recycled water as defined in Section 13529.2, may be subject to administrative civil liability in an amount not to exceed the following:

- (1) For the first violation, or a subsequent violation occurring more than 365 days from a previous violation, five thousand dollars (\$5,000).

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(2) For a second violation occurring within 365 days of a previous violation, ten thousand dollars (\$10,000).

(3) For a third or subsequent violation occurring within 365 days of a previous violation, twenty-five thousand dollars (\$25,000).

(b) The penalties in this section supplement, and shall not supplant, any other provisions of law.

Article 5. Surveys and Investigations

§13530. Duties of the department

The department, either independently or in cooperation with any person or any county, state, federal, or other agency, or on request of the state board, to the extent funds are allocated therefor, shall conduct surveys and investigations relating to the reclamation of water from waste pursuant to Section 230.

Article 6 Waste Water Regulation

§13540. CDPH authority for findings and regulations

(a) A person shall not construct, maintain, or use any waste well extending to or into a subterranean water-bearing stratum that is used or intended to be used as, or is suitable for, a source of water supply for domestic purposes.

(b)

(1) Notwithstanding subdivision (a), when a regional board finds that water quality considerations do not preclude controlled recharge of the stratum by direct injection, and when the State Department of **Public** Health, following a public hearing, finds the proposed recharge will not degrade the quality of water in the receiving aquifer as a source of water supply for domestic purposes, recycled water may be injected by a well into the stratum. The State Department of **Public** Health may make and enforce any regulations pertaining to this subdivision as it deems proper.

(2) This section shall not be construed to do either or both of the following:

(A) Affect the authority of the state board or regional boards to prescribe and enforce requirements for the discharge.

(B) Preempt the exercise by a water district of its existing ordinance authority to impose or implement stricter standards for protecting groundwater quality in the receiving aquifer.

(c) If the State Department of **Public** Health makes the findings provided for in subdivision (b), the department shall consider the state board's Statement of Policy with Respect to Maintaining High Quality of Waters in California, as set forth in Resolution 68-16, dated October 28, 1968, and shall also consider current and potential future public health consequences of the controlled recharge.

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§13541. Waste well

As used in this article, "waste well" includes any hole dug or drilled into the ground, used or intended to be used for the disposal of waste.

Article 7. Waste Water Reuse

§13550. Legislative findings

(a) The Legislature hereby finds and declares that the use of potable domestic water for nonpotable uses, including, but not limited to, cemeteries, golf courses, parks, highway landscaped areas, and industrial and irrigation uses, is a waste or an unreasonable use of the water within the meaning of Section 2 of Article X of the California Constitution if recycled water is available which meets all of the following conditions, as determined by the state board, after notice to any person or entity who may be ordered to use recycled water or to cease using potable water and a hearing held pursuant to Article 2 (commencing with Section 648) of Chapter 1.5 of Division 3 of Title 23 of the California Code of Regulations:

(1) The source of recycled water is of adequate quality for these uses and is available for these uses. In determining adequate quality, the state board shall consider all relevant factors, including, but not limited to, food and employee safety, and level and types of specific constituents in the recycled water affecting these uses, on a user-by-user basis. In addition, the state board shall consider the effect of the use of recycled water in lieu of potable water on the generation of hazardous waste and on the quality of wastewater discharges subject to regional, state, or federal permits.

(2) The recycled water may be furnished for these uses at a reasonable cost to the user. In determining reasonable cost, the state board shall consider all relevant factors, including, but not limited to, the present and projected costs of supplying, delivering, and treating potable domestic water for these uses and the present and projected costs of supplying and delivering recycled water for these uses, and shall find that the cost of supplying the treated recycled water is comparable to, or less than, the cost of supplying potable domestic water.

(3) After concurrence with the State Department of Health Services, the use of recycled water from the proposed source will not be detrimental to public health.

(4) The use of recycled water for these uses will not adversely affect downstream water rights, will not degrade water quality, and is determined not to be injurious to plantlife, fish, and wildlife.

(b) In making the determination pursuant to subdivision (a), the state board shall consider the impact of the cost and quality of the nonpotable water on each individual user.

(c) The state board may require a public agency or person subject to this article to furnish information which the state board determines to be relevant to making the determination required in subdivision (a).

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§13551. Industry and irrigation for restricted use of potable water prohibited: use of recycled water

A person or public agency, including a state agency, city, county, city and county, district, or any other political subdivision of the state, shall not use water from any source of quality suitable for potable domestic use for nonpotable uses, including cemeteries, golf courses, parks, highway landscaped areas, and industrial and irrigation uses if suitable recycled water is available as provided in Section 13550; however, any use of recycled water in lieu of water suitable for potable domestic use shall, to the extent of the recycled water so used, be deemed to constitute a reasonable beneficial use of that water and the use of recycled water shall not cause any loss or diminution of any existing water right.

§13552. Restrictions on Sections 13550 and 13551

The amendments to Sections 13550 and 13551 of the Water Code made during the first year of the 1991-92 Regular Session are not intended to alter any rights, remedies, or obligations which may exist prior to January 1, 1992, pursuant to, but not limited to, those sections or Chapter 8.5 (commencing with Section 1501) of Part 1 of Division 1 of the Public Utilities Code.

§13552.2. Legislative findings

(a) The Legislature hereby finds and declares that the use of potable domestic water for the irrigation of residential landscaping is a waste or an unreasonable use of water within the meaning of Section 2 of Article X of the California Constitution if recycled water, for this use, is available to the residents and meets the requirements set forth in Section 13550, as determined by the state board after notice and a hearing.

(b) The state board may require a public agency or person subject to this section to submit information that the state board determines may be relevant in making the determination required in subdivision (a).

§13552.4. Authority to require use of recycled water for residential landscaping

(a) Any public agency, including a state agency, city, county, city and county, district, or any other political subdivision of the state, may require the use of recycled water for irrigation of residential landscaping, if all of the following requirements are met:

(1) Recycled water, for this use, is available to the user and meets the requirements set forth in Section 13550, as determined by the state board after notice and a hearing.

(2) The use of recycled water does not cause any loss or diminution of any existing water right.

(3) The irrigation systems are constructed in accordance with Chapter 3 (commencing with Section 60301) of Division 4 of Title 22 of the California Code of Regulations.

(b) This section applies to both of the following:

(1) New subdivisions for which the building permit is issued on or after March 15, 1994, or, if a building permit is not required, new structures for which construction begins on or after

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March 15, 1994, for which the State Department of **Public** Health has approved the use of recycled water.

(2) Any residence that is retrofitted to permit the use of recycled water for landscape irrigation and for which the State Department of **Public** Health has approved the use of recycled water.

(c)

(1) Division 13 (commencing with Section 21000) of the Public Resources Code does not apply to any project that only involves the repiping, redesign, or use of recycled water for irrigation of residential landscaping necessary to comply with a requirement prescribed by a public agency under subdivision (a).

(2) The exemption in paragraph (1) does not apply to any project to develop recycled water, to construct conveyance facilities for recycled water, or any other project not specified in this subdivision.

§13552.5. General Permit for Landscape Irrigation – Use of CDPH Criteria

(a)

(1) On or before July 31, 2009, the state board shall adopt a general permit for landscape irrigation uses of recycled water for which the State Department of Public Health has established uniform statewide recycling criteria pursuant to Section 13521.

(2) The state board shall establish criteria to determine eligibility for coverage under the general permit.

(3) For the purpose of developing the general permit and establishing eligibility criteria to carry out paragraph (1), the state board shall hold at least one workshop and shall consult with and consider comments from the regional boards, groundwater management agencies and water replenishment districts with statutory authority to manage groundwater pursuant to their principal act, and any interested party.

(4) The general permit shall include language that provides for the modification of the terms and conditions of the general permit if a regulatory or statutory change occurs that affects the application of the general permit or as necessary to ensure protection of beneficial uses.

(b) The state board shall establish a reasonable schedule of fees to reimburse the state board for the costs it incurs in implementing, developing, and administering this section.

(c) Following the adoption of the general permit pursuant to this section, an applicant may obtain coverage for a landscape irrigation use of recycled water by filing a notice of intent to be covered under the general permit and submitting the appropriate fee established pursuant to subdivision (b) to the state board.

(d) Coverage under the general permit adopted pursuant to this section is effective if all of the following apply:

(1) The applicant has submitted a completed application.

(2) The state board has determined that the applicant meets the eligibility criteria established pursuant to paragraph (2) of subdivision (a).

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(3) The state board has made the application available for public review and comment for 30 days.

(4) The state board has consulted with the appropriate regional board.

(5) The executive officer of the state board approves the application.

(e)

(1) Except as provided by modification of the general permit, a person eligible for coverage under the general permit pursuant to subdivision (d) is not required to become or remain subject to individual waste discharge requirements or water reclamation requirements.

(2) For a landscape irrigation use of recycled water, a person who is subject to general or individual waste discharge requirements prescribed pursuant to Section 13263 or 13377, or is subject to individual or master water reclamation requirements prescribed pursuant to Section 13523 or 13523.1, may apply for coverage under the general permit adopted pursuant to this section in lieu of remaining subject to requirements prescribed pursuant to those sections.

(f)

(1) The state board shall designate an ombudsperson to coordinate and facilitate communication on recycled water, on the issuance of water reclamation requirements or waste discharge requirements, as applicable, pursuant to Section 13523 or 13523.1 or this section, and on the promotion of water recycling while ensuring reasonable protection of water quality in accordance with applicable provisions of state and federal water quality law.

(2) The person appointed pursuant to paragraph (1) shall facilitate consultations between the state board and the regional boards relating to matters described in that paragraph.

§13552.6. Legislative findings

(a) The Legislature hereby finds and declares that the use of potable domestic water for floor trap priming, cooling towers, and air-conditioning devices is a waste or an unreasonable use of water within the meaning of Section 2 of Article X of the California Constitution if recycled water, for these uses, is available to the user, and the water meets the requirements set forth in Section 13550, as determined by the state board after notice and a hearing.

(b) The state board may require a public agency or person subject to this section to submit information that the state board determines may be relevant in making the determination required in subdivision (a).

§13552.8. Recycled water for floor trap priming, cooling towers, and air conditioning

(a) Any public agency, including a state agency, city, county, city and county, district, or any other political subdivision of the state, may require the use of recycled water in floor trap priming, cooling towers, and air-conditioning devices, if all of the following requirements are met:

(1) Recycled water, for these uses, is available to the user and meets the requirements set forth in Section 13550, as determined by the state board after notice and a hearing.

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(2) The use of recycled water does not cause any loss or diminution of any existing water right.

(3) If public exposure to aerosols, mist, or spray may occur, appropriate mist mitigation or mist control is provided, such as the use of mist arrestors or the addition of biocides to the water in accordance with criteria established pursuant to Section 13521.

(4) The person intending to use recycled water has prepared an engineering report pursuant to Section 60323 of Title 22 of the California Code of Regulations that includes plumbing design, cross-connection control, and monitoring requirements for the public agency, which are in compliance with criteria established pursuant to Section 13521.

(b) This section applies to both of the following:

(1) New industrial facilities and subdivisions for which the building permit is issued on or after March 15, 1994, or, if a building permit is not required, new structures for which construction begins on or after March 15, 1994, for which the State Department of Health Services has approved the use of recycled water.

(2) Any structure that is retrofitted to permit the use of recycled water for floor traps, cooling towers, or air-conditioning devices, for which the State Department of Health Services has approved the use of recycled water.

(c)

(1) Division 13 (commencing with Section 21000) of the Public Resources Code does not apply to any project which only involves the repiping, redesign, or use of recycled water for floor trap priming, cooling towers, or air-conditioning devices necessary to comply with a requirement prescribed by a public agency under subdivision (a).

(2) The exemption in paragraph (1) does not apply to any project to develop recycled water, to construct conveyance facilities for recycled water, or any other project not specified in this subdivision.

§13553. Use of Recycled Water in Condominium Projects

(a) The Legislature hereby finds and declares that the use of potable domestic water for toilet and urinal flushing in structures is a waste or an unreasonable use of water within the meaning of Section 2 of Article X of the California Constitution if recycled water, for these uses, is available to the user and meets the requirements set forth in Section 13550, as determined by the state board after notice and a hearing.

(b) The state board may require a public agency or person subject to this section to furnish **any** information that may be relevant to making the determination required in subdivision (a).

(c) For purposes of this section and Section 13554, “structure” or “structures” means commercial, retail, and office buildings, theaters, auditoriums, condominium projects, schools, hotels, apartments, barracks, dormitories, jails, prisons, and reformatories, and other structures as determined by the State Department of Public Health.

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(d) Recycled water may be used in condominium projects, as defined in Section 1351 of the Civil Code, subject to all of the following conditions:

(1) Prior to the indoor use of recycled water in any condominium project, the agency delivering the recycled water to the condominium project shall file a report with, **and receive written approval of the report from, the State Department of Public Health.** The report shall be consistent with the provisions of Title 22 of the California Code of Regulations generally applicable to dual-plumbed structures and shall include all the following:

(A) That potable water service to each condominium project will be provided with a backflow protection device approved by the State Department of Public Health to protect the agency's public water system, as defined in Section 116275 of the Health and Safety Code. The backflow protection device approved by the State Department of Public Health shall be inspected and tested annually by a person certified in the inspection of backflow prevention devices.

(B) That any plumbing modifications in the condominium unit or any physical alteration of the structure will be done in compliance with state and local plumbing codes.

(C) That each condominium project will be tested by the recycled water agency or the responsible local agency at least once every four years to ensure that there are no indications of a possible cross connection between the condominium's potable and nonpotable systems.

(D) That recycled water lines will be color coded consistent with current statutes and regulations.

(2) The recycled water agency or the responsible local agency shall maintain records of all tests and annual inspections conducted.

(3) The condominium's declaration, as defined in Section 1351 of the Civil Code, shall provide that the laws and regulations governing recycled water apply, **shall not permit any exceptions** to those laws and regulations, shall incorporate the report described in paragraph (1), and shall contain the following statement:

“NOTICE OF USE OF RECYCLED WATER

This property is approved by the State Department of Public Health for the use of recycled water for toilet and urinal flushing. This water is not potable, is not suitable for indoor purposes other than toilet and urinal flushing purposes, and requires dual plumbing. Alterations and modifications to the plumbing system require a permit and are prohibited without first consulting with the appropriate local building code enforcement agency and your property management company or homeowners' association to ensure that the recycled water is not mixed with the drinking water.”

(e) The State Department of Public Health may adopt regulations as necessary to assist in the implementation of this section.

(f) This section shall only apply to condominium projects that are created, within the meaning of Section 1352 of the Civil Code, on or after January 1, 2008.

(g) This section and Section 13554 do not apply to a pilot program adopted pursuant to Section 13553.1.

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§13553.1. Legislative findings

(a) The Legislature hereby finds and declares that certain coastal areas of the state have been using sea water to flush toilets and urinals as a means of conserving potable water; that this practice precludes the beneficial reuse of treated wastewater and has had a deleterious effect on the proper wastewater treatment process, and has led to corrosion of the sea water distribution pipelines and wastewater collection systems; and that this situation must be changed.

(b) There is a need for a pilot program to demonstrate that conversion to the use of recycled water in residential buildings for toilet and urinal flushing does not pose a threat to public health and safety.

(c) A city that is providing a separate distribution system for sea water for use in flushing toilets and urinals in residential structures may, by ordinance, authorize the use of recycled water for the flushing of toilets and urinals in residential structures if the level of treatment and the use of the recycled water meets the criteria set by the State Department of Health Services.

§13554. Recycled water for toilet and urinal flushing

(a) Any public agency, including a state agency, city, county, city and county, district, or any other political subdivision of the state, may require the use of recycled water for toilet and urinal flushing in structures, except a mental hospital or other facility operated by a public agency for the treatment of persons with mental disorders, if all of the following requirements are met:

(1) Recycled water, for these uses, is available to the user and meets the requirements set forth in Section 13550, as determined by the state board after notice and a hearing.

(2) The use of recycled water does not cause any loss or diminution of any existing water right.

(3) The public agency has prepared an engineering report pursuant to Section 60323 of Title 22 of the California Code of Regulations that includes plumbing design, cross-connection control, and monitoring requirements for the use site, which are in compliance with criteria established pursuant to Section 13521.

(b) This section applies only to either of the following:

(1) New structures for which the building permit is issued on or after March 15, 1992, or, if a building permit is not required, new structures for which construction begins on or after March 15, 1992.

(2) Any construction pursuant to subdivision (a) for which the State Department of Health Services has, prior to January 1, 1992, approved the use of recycled water.

(c) Division 13 (commencing with Section 21000) of the Public Resources Code does not apply to any project which only involves the repiping, redesign, or use of recycled water by a structure necessary to comply with a requirement issued by a public agency under subdivision (a). This exemption does not apply to any project to develop recycled water, to construct conveyance facilities for recycled water, or any other project not specified in this subdivision.

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§13554.2. DHS fees

(a) Any person or entity proposing the use of recycled water shall reimburse the State Department of Health Services for reasonable costs that department actually incurs in performing duties pursuant to this chapter.

(b)

(1) Upon a request from the person or entity proposing the use of recycled water, the State Department of Health Services shall, within a reasonable time after the receipt of the request, provide an estimate of the costs that it will reasonably incur in the performance of its duties pursuant to this chapter.

(2) For purposes of implementing subdivision (a), that department shall maintain a record of its costs. In determining those costs, that department may consider costs that include, but are not limited to, costs relating to personnel requirements, materials, travel, and office overhead. The amount of reimbursement shall be equal to, and may not exceed, that department's actual costs.

(c) With the consent of the person or entity proposing the use of recycled water, the State Department of Health Services may delegate all or part of the duties that department performs pursuant to this chapter within a county to a local health agency authorized by the board of supervisors to assume these duties, if, in the judgment of that department, the local health agency can perform these duties. Any person or entity proposing the use of recycled water shall reimburse the local health agency for reasonable costs that the local health agency actually incurs in the performance of its duties delegated pursuant to this subdivision.

(d)

(1) Upon a request from the person or entity proposing the use of recycled water, the local health agency shall, within a reasonable time after the receipt of the request, provide an estimate of the cost it will reasonably incur in the performance of its duties delegated under subdivision (c).

(2) The local health agency, if delegated duties pursuant to subdivision (c), shall maintain a record of its costs that include, but is not limited to, costs relating to personnel requirements, materials, travel, and office overhead. The amount of reimbursement shall be equal to, and may not exceed, the local health agency's actual costs.

(e) The State Department of Health Services or local health agency shall complete its review of a proposed use of recycled water within a reasonable period of time. That department shall submit to the person or entity proposing the use of recycled water a written determination as to whether the proposal submitted is complete for purposes of review within 30 days from the date of receipt of the proposal and shall approve or disapprove the proposed use within 30 days from the date on which that department determines that the proposal is complete.

(f) An invoice for reimbursement of services rendered shall be submitted to the person or entity proposing the use of recycled water subsequent to completion of review of the proposed use, or other services rendered, that specifies the number of hours spent by the State Department

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of Health Services or local health agency, specific tasks performed, and other costs actually incurred. Supporting documentation, including receipts, logs, timesheets, and other standard accounting documents, shall be maintained by that department or local health agency and copies, upon request, shall be provided to the person or entity proposing the use of recycled water.

(g) For the purposes of this section, "person or entity proposing the use of recycled water" means the producer or distributor of recycled water submitting a proposal to the department.

§13554.3. State Board fees

The State Water Resources Control Board may establish a reasonable schedule of fees by which it is reimbursed for the costs it incurs pursuant to Sections 13553 and 13554.

§13555.2. Legislative intent

The Legislature hereby finds and declares that many local agencies deliver recycled water for nonpotable uses and that the use of recycled water is an effective means of meeting the demands for new water caused by drought conditions or population increases in the state. It is the intent of the Legislature to encourage the design and construction of water delivery systems on private property that deliver water for both potable and nonpotable uses in separate pipelines.

§13555.3. Separate pipelines

(a) Water delivery systems on private property that could deliver recycled water for nonpotable uses described in Section 13550, that are constructed on and after January 1, 1993, shall be designed to ensure that the water to be used for only potable domestic uses is delivered, from the point of entry to the private property to be served, in a separate pipeline which is not used to deliver the recycled water.

(b) This section applies to water delivery systems on private property constructed within either of the following jurisdictions:

(1) One that has an urban water management plan that includes the intent to develop recycled water use.

(2) One that does not have an urban water management plan that includes recycled water use, but that is within five miles of a jurisdiction that does have an urban water management plan that includes recycled water use, and has indicated a willingness to serve the water delivery system.

(c) This section does not preempt local regulation of the delivery of water for potable and nonpotable uses and any local governing body may adopt requirements which are more restrictive than the requirements of this section.

§13556. Acquisition and provision of recycled water for beneficial use

In addition to any other authority provided in law, any water supplier described in subdivision (b) of Section 1745 may acquire, store, provide, sell, and deliver recycled water for any beneficial use, including, but not limited to, municipal, industrial, domestic, and irrigation uses,

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if the water use is in accordance with statewide recycling criteria and regulations established pursuant to this chapter.

§13557. Regulation to safely plumb buildings with both potable and recycled water systems

(a) On or before July 1, 2008, the department, in consultation with the State Department of Public Health, shall adopt and submit to the California Building Standards Commission regulations to establish a state version of Appendix J of the Uniform Plumbing Code adopted by the International Association of Plumbing and Mechanical Officials to provide design standards to safely plumb buildings with both potable and recycled water systems.

(b) The department shall adopt regulations pursuant to subdivision (a) only if the Legislature appropriates funds for that purpose.

Chapter 7.3. Direct and Indirect Potable Reuse

§13560. Legislative Findings - Direct and Indirect Potable Reuse

The Legislature finds and declares the following:

(a) In February 2009, the state board unanimously adopted, as Resolution No. 2009-0011, an updated water recycling policy, which includes the goal of increasing the use of recycled water in the state over 2002 levels by at least 1,000,000 acre-feet per year by 2020 and by at least 2,000,000 acre-feet per year by 2030.

(b) Section 13521 requires the department to establish uniform statewide recycling criteria for each varying type of use of recycled water where the use involves the protection of public health.

(c) The use of recycled water for indirect potable reuse is critical to achieving the state board's goals for increased use of recycled water in the state. If direct potable reuse can be demonstrated to be safe and feasible, implementing direct potable reuse would further aid in achieving the state board's recycling goals.

(d) Although there has been much scientific research on public health issues associated with indirect potable reuse through groundwater recharge, there are a number of significant unanswered questions regarding indirect potable reuse through surface water augmentation and direct potable reuse.

(e) Achievement of the state's goals depends on the timely development of uniform statewide recycling criteria for indirect and direct potable water reuse.

(f) This chapter is not intended to delay, invalidate, or reverse any study or project, or development of regulations by the department, the state board, or the regional boards regarding the use of recycled water for indirect potable reuse for groundwater recharge, surface water augmentation, or direct potable reuse.

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(g) This chapter shall not be construed to delay, invalidate, or reverse the department's ongoing review of projects consistent with Section 116551 of the Health and Safety Code.

§13561. Chapter Definitions

For purposes of this chapter, the following terms have the following meanings:

(a) "Department" means the State Department of Public Health.

(b) "Direct potable reuse" means the planned introduction of recycled water either directly into a public water system, as defined in Section 116275 of the Health and Safety Code, or into a raw water supply immediately upstream of a water treatment plant.

(c) "Indirect potable reuse for groundwater recharge" means the planned use of recycled water for replenishment of a groundwater basin or an aquifer that has been designated as a source of water supply for a public water system, as defined in Section 116275 of the Health and Safety Code.

(d) "Surface water augmentation" means the planned placement of recycled water into a surface water reservoir used as a source of domestic drinking water supply.

(e) "Uniform water recycling criteria" has the same meaning as in Section 13521.

§13561.5. Board agreement with Department

The state board shall enter into an agreement with the department to assist in implementing this chapter.

§13562. Department adoption of indirect potable reuse criteria

(a)

(1) On or before December 31, 2013, the department shall adopt uniform water recycling criteria for indirect potable reuse for groundwater recharge.

(2)

(A) Except as provided in subparagraph (C), on or before December 31, 2016, the department shall develop and adopt uniform water recycling criteria for surface water augmentation.

(B) Prior to adopting uniform water recycling criteria for surface water augmentation, the department shall submit the proposed criteria to the expert panel convened pursuant to subdivision (a) of Section 13565. The expert panel shall review the proposed criteria and shall adopt a finding as to whether, in its expert opinion, the proposed criteria would adequately protect public health.

(C) The department shall not adopt uniform water recycling criteria for surface water augmentation pursuant to subparagraph (A), unless and until the expert panel adopts a finding that the proposed criteria would adequately protect public health.

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(b) Adoption of uniform water recycling criteria by the department is subject to the requirements of Chapter 3.5 (commencing with Section 11340) of Part 1 of Division 3 of Title 2 of the Government Code.

§13563. Department report on direct potable reuse

(a)

(1) The department shall investigate and report to the Legislature on the feasibility of developing uniform water recycling criteria for direct potable reuse.

(2) The department shall complete a public review draft of its report by June 30, 2016. The department shall provide the public not less than 45 days to review and comment on the public review draft.

(3) The department shall provide a final report to the Legislature by December 31, 2016. The department shall make the final report available to the public.

(b) In conducting the investigation pursuant to subdivision (a), the department shall examine all of the following:

(1) The availability and reliability of recycled water treatment technologies necessary to ensure the protection of public health.

(2) Multiple barriers and sequential treatment processes that may be appropriate at wastewater and water treatment facilities.

(3) Available information on health effects.

(4) Mechanisms that should be employed to protect public health if problems are found in recycled water that is being served to the public as a potable water supply, including, but not limited to, the failure of treatment systems at the recycled water treatment facility.

(5) Monitoring needed to ensure protection of public health, including, but not limited to, the identification of appropriate indicator and surrogate constituents.

(6) Any other scientific or technical issues that may be necessary, including, but not limited to, the need for additional research.

(c)

(1) Notwithstanding Section 10231.5 of the Government Code, the requirement for submitting a report imposed under paragraph (3) of subdivision (a) is inoperative on December 31, 2020.

(2) A report to be submitted pursuant to paragraph (3) of subdivision (a) shall be submitted in compliance with Section 9795 of the Government Code.

§13563.5. Department report to legislature

(a) The department, in consultation with the state board, shall report to the Legislature as part of the annual budget process, in each year from 2011 to 2016, inclusive, on the progress towards developing and adopting uniform water recycling criteria for surface water augmentation and its investigation of the feasibility of developing uniform water recycling criteria for direct potable reuse.

(b)

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(1) A written report submitted pursuant to subdivision (a) shall be submitted in compliance with Section 9795 of the Government Code.

(2) Pursuant to Section 10231.5 of the Government Code, this section is repealed on January 1, 2017.

§13564. Surface Water Augmentation considerations

In developing uniform recycling criteria for surface water augmentation, the department shall consider all of the following:

(a) The final report from the National Water Research Institute Independent Advisory Panel for the City of San Diego Indirect Potable Reuse/Reservoir Augmentation (IPR/RA) Demonstration Project.

(b) Monitoring results of research and studies regarding surface water augmentation.

(c) Results of demonstration studies conducted for purposes of approval of projects using surface water augmentation.

(d) Epidemiological studies and risk assessments associated with projects using surface water augmentation.

(e) Applicability of the advanced treatment technologies required for recycled water projects, including, but not limited to, indirect potable reuse for groundwater recharge projects.

(f) Water quality, limnology, and health risk assessments associated with existing potable water supplies subject to discharges from municipal wastewater, stormwater, and agricultural runoff.

(g) Recommendations of the State of California Constituents of Emerging Concern Recycled Water Policy Science Advisory Panel.

(h) State funded research pursuant to Section 79144 and subdivision (b) of Section 79145.

(i) Research and recommendations from the United States Environmental Protection Agency Guidelines for Water Reuse.

(j) Other relevant research and studies regarding indirect potable reuse of recycled water.

§13565. Expert panels and advisory groups

(a)

(1) The department shall convene and administer an expert panel for the purposes of advising the department on public health issues and scientific and technical matters regarding development of uniform water recycling criteria for indirect potable reuse through surface water augmentation and investigation of the feasibility of developing uniform water recycling criteria for direct potable reuse.

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(2) The expert panel shall be comprised, at a minimum, of a toxicologist, an engineer licensed in the state with at least three years' experience in wastewater treatment, an engineer licensed in the state with at least three years' experience in treatment of drinking water supplies and knowledge of drinking water standards, an epidemiologist, a microbiologist, and a chemist.

(3) Members of the expert panel may be reimbursed for reasonable and necessary travel expenses.

(b)

(1) The department may appoint an advisory group, task force, or other group, comprised of no fewer than nine representatives of water and wastewater agencies, local public health officers, environmental organizations, environmental justice organizations, public health nongovernmental organizations, and the business community, to advise the department regarding the development of uniform water recycling criteria for direct potable reuse.

(2) Environmental, environmental justice, and public health nongovernmental organization representative members of the advisory group, task force, or other group may be reimbursed for reasonable and necessary travel expenses.

§13566. Feasibility considerations for direct potable reuse

In performing its investigation of the feasibility of developing the uniform water recycling criteria for direct potable reuse, the department shall consider all of the following:

(a) Recommendations from the expert panel appointed pursuant to subdivision (a) of Section 13565.

(b) Recommendations from an advisory group, task force, or other group appointed by the department pursuant to subdivision (b) of Section 13565.

(c) Regulations and guidelines for these activities from jurisdictions in other states, the federal government, or other countries.

(d) Research by the state board regarding unregulated pollutants, as developed pursuant to Section 10 of the recycled water policy adopted by state board Resolution No. 2009-0011.

(e) Results of investigations pursuant to Section 13563.

(f) Water quality and health risk assessments associated with existing potable water supplies subject to discharges from municipal wastewater, stormwater, and agricultural runoff.

§13567. Federal & State references - consistency

An action authorized pursuant to this chapter shall be consistent, to the extent applicable, with the federal Clean Water Act (33 U.S.C. Sec. 1251 et seq.), the federal Safe Drinking Water Act (42 U.S.C. Sec. 300f et seq.), this division, and the California Safe Drinking Water Act (Chapter 4 (commencing with Section 116270) of Part 12 of Division 104 of the Health and Safety Code).

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§13569. Department funding

The department may accept funds from any source, and may expend these funds, upon appropriation by the Legislature, for the purposes of this chapter.

Chapter 7.5. Water Recycling Act of 1991

§13575. Recycling Act title

(a) This chapter shall be known and may be cited as the Water Recycling Act of 1991.

(b) As used in this chapter, the following terms have the following meanings:

(1) "Customer" means a person or entity that purchases water from a retail water supplier.

(2) "Entity responsible for groundwater replenishment" means any person or entity authorized by statute or court order to manage a groundwater basin and acquire water for groundwater replenishment.

(3) "Recycled water" has the same meaning as defined in subdivision (n) of Section 13050.

(4) "Recycled water producer" means any local public entity that produces recycled water.

(5) "Recycled water wholesaler" means any local public entity that distributes recycled water to retail water suppliers and which has constructed, or is constructing, a recycled water distribution system.

(6) "Retail water supplier" means any local entity, including a public agency, city, county, or private water company, that provides retail water service.

(7) "Retailer" means the retail water supplier in whose service area is located the property to which a customer requests the delivery of recycled water service.

§13576. Legislative findings

The Legislature hereby makes the following findings and declarations:

(a) The State of California is subject to periodic drought conditions.

(b) The development of traditional water resources in California has not kept pace with the state's population, which is growing at the rate of over 700,000 per year and which is anticipated to reach 36,000,000 by the year 2010.

(c) There is a need for a reliable source of water for uses not related to the supply of potable water to protect investments in agriculture, greenbelts, and recreation and to replenish groundwater basins, and protect and enhance fisheries, wildlife habitat, and riparian areas.

(d) The environmental benefits of recycled water include a reduced demand for water in the Sacramento-San Joaquin Delta that is otherwise needed to maintain water quality, reduced discharge of waste into the ocean, and the enhancement of groundwater basins, recreation, fisheries, and wetlands.

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(e) The use of recycled water has proven to be safe from a public health standpoint, and the State Department of **Public** Health is updating regulations for the use of recycled water.

(f) The use of recycled water is a cost-effective, reliable method of helping to meet California's water supply needs.

(g) The development of the infrastructure to distribute recycled water will provide jobs and enhance the economy of the state.

(h) Retail water suppliers and recycled water producers and wholesalers should promote the substitution of recycled water for potable water and imported water in order to maximize the appropriate cost-effective use of recycled water in California.

(i) Recycled water producers, retail water suppliers, and entities responsible for groundwater replenishment should cooperate in joint technical, economic, and environmental studies, as appropriate, to determine the feasibility of providing recycled water service.

(j) Retail water suppliers and recycled water producers and wholesalers should be encouraged to enter into contracts to facilitate the service of recycled and potable water by the retail water suppliers in their service areas in the most efficient and cost-effective manner.

(k) Recycled water producers and wholesalers and entities responsible for groundwater replenishment should be encouraged to enter into contracts to facilitate the use of recycled water for groundwater replenishment if recycled water is available and the authorities having jurisdiction approve its use.

(l) Wholesale prices set by recycled water producers and recycled water wholesalers, and rates that retail water suppliers are authorized to charge for recycled water, should reflect an equitable sharing of the costs and benefits associated with the development and use of recycled water.

§13577. Water recycling goal

This chapter establishes a statewide goal to recycle a total of 700,000 acre-feet of water per year by the year 2000 and 1,000,000 acre-feet of water per year by the year 2010.

§13578. Recycled Water Task Force

(a) In order to achieve the statewide goal for recycled water use established in Section 13577 and to implement the Governor's Advisory Drought Planning Panel Critical Water Shortage Contingency Plan recommendations, Section F2, as submitted December 29, 2000, the department shall identify and report to the Legislature on opportunities for increasing the use of recycled water, as defined in paragraph (3) of subdivision (b) of Section 13575, and identify constraints and impediments, including the level of state financial assistance available for project construction, to increasing the use of recycled water.

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(b) The department shall convene a task force, to be known as the 2002 Recycled Water Task Force, to advise the department in implementation of subdivision (a), including making recommendations to the Legislature regarding the following:

(1) How to further the use of recycled water in industrial and commercial applications, including, but not limited to, those applications set forth in Section 13552.8. The task force shall evaluate the current regulatory framework of state and local rules, regulations, ordinances, and permits to identify the obstacles and disincentives to industrial and commercial reuse. Issues to be investigated include, but are not limited to, applicability of visual inspections instead of pressure tests for cross-connections between potable and nonpotable water systems, dual piping trenching restrictions, fire suppression system design, and backflow protections.

(2) Changes in the Uniform Plumbing Code, published by the International Association of Plumbing and Mechanical Officials, that are appropriate to facilitate the use of recycled water in industrial and commercial settings. The department shall make recommendations to the California Building Standards Commission with regard to suggested revisions to the California Plumbing Code necessary to incorporate the changes identified by the task force.

(3) Changes in state statutes or the current regulatory framework of state and local rules, regulations, ordinances, and permits appropriate to increase the use of recycled water for commercial laundries and toilet and urinal flushing in structures including, but not limited to, those defined in subdivision (c) of Section 13553. The department shall identify financial incentives to help offset the cost of retrofitting privately and publicly owned structures.

(4) The need to reconvene the California Potable Reuse Committee established by the department in 1993 or convene a successor committee to update the committee's finding that planned indirect potable reuse of recycled water by augmentation of surface water supplies would not adversely affect drinking water quality if certain conditions were met.

(5) The need to augment state water supplies using water use efficiency strategies identified in the CALFED Bay-Delta Program. In its report pursuant to subdivision (a), the department shall identify ways to coordinate with CALFED to assist local communities in educating the public with regard to the statewide water supply benefits of local recycling projects and the level of public health protection ensured by compliance with the uniform statewide water recycling criteria developed by the State Department of **Public** Health in accordance with Section 13521.

(6) Impediments or constraints, other than water rights, related to increasing the use of recycled water in applications for agricultural, environmental, or irrigation uses, as determined by the department.

(c)

(1) The task force shall be convened by the department and be comprised of one representative from each of the following state agencies:

(A) The department.

(B) The State Department of **Public** Health.

(C) The state board.

(D) The California Environmental Protection Agency.

(E) The CALFED Bay-Delta Program.

(F) The Department of Food and Agriculture.

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(G) The **California** Building Standards Commission.

(H) The University of California.

(I) The **Natural** Resources Agency.

(2) The task force shall also include one representative from a recognized environmental advocacy group and one representative from a consumer advocacy group, as determined by the department, and one representative of local agency health officers, one representative of urban water wholesalers, one representative from a groundwater management entity, one representative of water districts, one representative from a nonprofit association of public and private members created to further the use of recycled water, one representative of commercial real estate, one representative of land development, one representative of industrial interests, and at least two representatives from each of the following as defined in Section 13575:

(A) Recycled water producer.

(B) Recycled water wholesaler.

(C) Retail water supplier.

(d) The department and the task force shall report to the Legislature not later than July 1, 2003.

(e) The department shall carry out the duties of this section only to the extent that funds pursuant to Section 79145, enacted as part of the Safe Drinking Water, Clean Water, Watershed Protection, and Flood Protection Act (Division 26 (commencing with Section 79000)), are made available for the purposes of this section

§13579. Identification of potential uses

(a) In order to achieve the goals established in Section 13577, retail water suppliers shall identify potential uses for recycled water within their service areas, potential customers for recycled water service within their service areas, and, within a reasonable time, potential sources of recycled water.

(b) Recycled water producers and recycled water wholesalers may also identify potential uses for recycled water, and may assist retail water suppliers in identifying potential customers for recycled water service within the service areas of those retail water suppliers.

(c) Recycled water producers, retail water suppliers, and entities responsible for groundwater replenishment may cooperate in joint technical, economic, and environmental studies, as appropriate, to determine the feasibility of providing recycled water service and recycled water for groundwater replenishment consistent with the criteria set forth in paragraphs (1) to (3), inclusive, of subdivision (a) of Section 13550 and in accordance with Section 60320 of Title 22 of the California Code of Regulations.

§13580. Application for recycled water supply

(a) A retail water supplier that has identified a potential use or customer pursuant to Section 13579 may apply to a recycled water producer or recycled water wholesaler for a recycled water supply.

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(b) A recycled water producer or recycled water wholesaler that has identified a potential use or customer pursuant to Section 13579 may, in writing, request a retail water supplier to enter into an agreement to provide recycled water to the potential customer.

(c) A customer may request, in writing, a retailer to enter into an agreement to provide recycled water to the customer.

(d)

(1) An entity responsible for groundwater replenishment that is a customer of a retail water supplier and that has identified the potential use of recycled water for groundwater replenishment purposes may, in writing, request that retail water supplier to enter into an agreement to provide recycled water for that purpose. That entity may not obtain recycled water for that purpose from a recycled water producer, a recycled water wholesaler, or another retail water supplier without the agreement of the entity's retail water supplier.

(2) An entity responsible for groundwater replenishment that is not a customer of a retail water supplier and that has identified the potential use of recycled water for groundwater replenishment purposes may, in writing, request a retail water supplier, a recycled water producer, or a recycled water wholesaler to enter into an agreement to provide recycled water for that purpose.

§13580.5. Agreements

(a)

(1) Subject to subdivision (e) of Section 13580.7, a retail water supplier that receives a request from a customer pursuant to subdivision (c) of Section 13580 shall enter into an agreement to provide recycled water, if recycled water is available, or can be made available, to the retail water supplier for sale to the customer.

(2) Notwithstanding paragraph (1), in accordance with a written agreement between a recycled water producer or a recycled water wholesaler and a retail water supplier, the retail water supplier may delegate to a recycled water producer or a recycled water wholesaler its responsibility under this section to provide recycled water.

(b) A customer may not obtain recycled water from a recycled water producer, a recycled water wholesaler, or a retail water supplier that is not the retailer without the agreement of the retailer.

(c) If either a recycled water producer or a recycled water wholesaler provides a customer of a retail water supplier with a written statement that it can and will provide recycled water to the retailer, the retail water supplier shall, not later than 120 days from the date on which the retail water supplier receives the written statement from the customer, by certified mail, return receipt requested, submit a written offer to the customer. A determination of availability pursuant to Section 13550 is not required.

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(d) If the state board pursuant to Section 13550 makes a determination that there is available recycled water to serve a customer of a retail water supplier, the retail water supplier, not later than 120 days from the date on which the retail water supplier receives a copy of that determination from the customer, by certified mail, return receipt requested, shall submit a written offer to the customer.

§13580.7. Public Agency Retail Water Suppliers

(a) This section applies only to a retail water supplier that is a public agency.

(b) A customer may request, in writing, a retail water supplier to enter into an agreement or adopt recycled water rates in order to provide recycled water service to the customer. The retail water supplier, by certified mail return receipt requested, shall submit a written offer to the customer not later than 120 days from the date on which the retail water supplier receives the written request from the customer.

(c) If no rate is in effect for recycled water service within the service area of a retail water supplier, the rate and conditions for recycled water service shall be established by contract between the retail water supplier and the customer, not later than 120 days from the date on which the customer requests a contract, or, by resolution or ordinance by the retail water supplier, not later than 120 days from the date on which the retail water supplier receives the customer's written request for an ordinance or resolution.

(d) A rate for recycled water service established by contract, ordinance, or resolution, shall reflect a reasonable relationship between the amount of the rate and the retail cost of obtaining or producing the recycled water, the cost of conveying the recycled water, and overhead expenses for providing recycled water service. Capital costs of facilities required to serve the customer shall be amortized over the economic life of the facility, or the length of time the customer agrees to purchase recycled water, whichever is less. The rate shall not exceed the estimated reasonable cost of providing the service, and any additional costs agreed to by the customer for recycled water supplemental treatment.

(e) The rate for recycled water shall be comparable to, or less than, the retail water supplier's rate for potable water. If recycled water service cannot be provided at a rate comparable to, or less than, the rate for potable water, the retail water supplier is not required to provide the recycled water service, unless the customer agrees to pay a rate that reimburses the retail water supplier for the costs described in subdivision (c).

(f) The offer required by subdivisions (c) and (d) of Section 13580.5 shall identify all of the following:

- (1) The source for the recycled water.
- (2) The method of conveying the recycled water.
- (3) A schedule for delivery of the recycled water.
- (4) The terms of service.
- (5) The rate for the recycled water, including the per-unit cost for that water.

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(6) The costs necessary to provide service and the basis for determining those costs.

(g) This section does not apply to recycled water service rates established before January 1, 1999, or any amendments to those rates.

§13580.8. Retail water supplier regulated by the PUC

(a) This section applies only to a retail water supplier that is regulated by the Public Utilities Commission.

(b) Rates for recycled water that is provided to the customer by a retail water supplier regulated by the Public Utilities Commission shall be established by the commission pursuant to Section 455.1 of the Public Utilities Code. A regulated water utility may request the commission to establish the rate or rates for the delivery of recycled or nonpotable water, with the objective of providing, where practicable, a reasonable economic incentive for the customer to purchase recycled or nonpotable water in place of potable water.

(c) A regulated water utility may propose a rate or rates for recycled or nonpotable water by tariff or by contract between the retail water supplier and the customer. Where the rate or rates are set by contract, the water utility and its customer shall meet, confer, and negotiate in good faith to establish a contract rate.

(d) The commission shall, as appropriate, provide a discount from the general metered rate of the water utility for potable water by either of the following means:

(1) Passing through to the customer the net reduction in cost to the water utility in purchasing and delivering recycled or nonpotable water as compared to the cost of purchasing and delivering potable water.

(2) Granting to the customer a uniform discount from the water utility's general metered potable water rate when the discount in paragraph (1) is determined to be an insufficient incentive for the customer to convert to the use of recycled or nonpotable water. If the commission provides for a discount pursuant to this paragraph that is greater than the water utility's reduction in cost, the commission shall authorize the water utility to include the aggregate amount of that discount in its revenue requirements to be applied to, and recovered in, rates that are applicable to all general metered customers.

§13580.9. City of West Covina

(a) Notwithstanding any **other law**, and except as otherwise previously provided for in a contract agreed to by the customer and the City of West Covina, if the purchaser, contractor, or lessee of, or successor to, all or a portion of the water utility owned by the City of West Covina is a retail water supplier that is regulated by the Public Utilities Commission, rates for recycled or nonpotable water service to a closed hazardous waste and solid waste facility located within the boundaries of the City of West Covina for the purposes of irrigation, recreation, or dust suppression or any other use at that facility shall be established in accordance with subdivisions (a) to (e), inclusive, of Section 13580.7, and if there is a failure to agree on the terms and

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conditions of a recycled or nonpotable water supply agreement for the delivery of water for those purposes by that purchaser, contractor, lessee, or successor, Section 13581 shall apply.

(b) For the purpose of this section, nonpotable water that is not the result of the treatment of waste shall be treated as the equivalent of recycled water if it is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is therefor considered a valuable resource, if the use of that water will not adversely affect downstream water rights, degrade water quality, or be injurious to plant life, fish, or wildlife, as provided by statute or by regulations of the State Department of **Public** Health and the state board or a regional board, as appropriate.

§13581. Formal mediation process

(a) If there is a failure to agree on terms and conditions of a recycled water supply agreement involving a retail water supplier that is a public agency within 180 days from the date of the receipt of a request for recycled water pursuant to subdivision (c) of Section 13580, a written statement pursuant to subdivision (c) of Section 13580.5, or a determination of availability pursuant to subdivision (d) of Section 13580.5, any party may request a formal mediation process. The parties shall commence mediation within 60 days after the mediation request is made. If the parties cannot agree on a mediator, the director shall appoint a mediator. The mediator may recommend to the parties appropriate terms and conditions applicable to the service of recycled water. The cost for the services of the mediator shall be divided equally among the parties to the mediation and shall not exceed twenty thousand dollars (\$20,000).

(b) If the parties in mediation reach agreement, both parties together shall draft the contract for the recycled water service. The parties shall sign the contract within 30 days.

(c) If the parties in mediation fail to reach agreement, the affected retail water supplier shall, within 30 days, by resolution or ordinance, adopt a rate for recycled water service. The agency action shall be subject to validating proceedings pursuant to Chapter 9 (commencing with Section 860) of Part 2 of Title 10 of the Code of Civil Procedure, except that there shall not be a presumption in favor of the retail water supplier under the action taken to set the rate for recycled water service. The mediator shall file a report with the superior court setting forth the recommendations provided to the parties regarding appropriate terms and conditions applicable to the service of recycled water. Each party shall bear its own costs and attorney's fees.

§13581.2. Process for a retail water supplier regulated by the PUC

If the retail water supplier is regulated by the Public Utilities Commission, and there is a failure to agree on terms and conditions of a recycle water supply agreement with a customer within 180 days from the date of the receipt of a request for recycled water pursuant to subdivision (c) of Section 13580, a written statement pursuant to subdivision (c) of Section 13580.5, or a determination of availability pursuant to subdivision (d) of Section 13580.5, the matter shall be submitted to the Public Utilities Commission for resolution, and the commission shall determine a contract rate or rates for recycled water as provided in Section 13580.8.

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§13582. Construction of chapter

This chapter is not intended to alter either of the following:

- (a) Any rights, remedies, or obligations which may exist pursuant to Article 1.5 (commencing with Section 1210) of Chapter 1 of Part 2 of Division 2 of this code or Chapter 8.5 (commencing with Section 1501) of Part 1 of Division 1 of the Public Utilities Code.
- (b) Any rates established or contracts entered into prior to January 1, 1999.

§13583. Noncompliance

(a) If a retail water supplier that is a public agency does not comply with this chapter, the customer may petition a court for a writ of mandate pursuant to Chapter 2 (commencing with Section 1084) of Title 1 of Part 3 of the Code of Civil Procedure.

(b) If a retail water supplier is regulated by the Public Utilities Commission and does not comply with this chapter, the Public Utilities Commission may order the retailer to comply with this chapter after receiving a petition from the customer specifying the provisions of this chapter with which the retailer has failed to comply.

Chapter 9. Waste Water Treatment Plant Classification and Operator Certifications

§13627. Classification and Operator Certifications (as amended effective January 2011)

(a) Supervisors and operators of those wastewater treatment plants described in paragraph (1) or (2) of subdivision (b) of Section 13625 shall possess a certificate of appropriate grade. Subject to the approval of regulations by the state board, supervisors and operators of those wastewater treatment plants described in paragraph (3) of subdivision (b) of Section 13625 shall possess certificates of the appropriate grade. All certificates shall be issued in accordance with, and to the extent recommended by the advisory committee and required by, regulations adopted by the state board. The state board shall develop and specify in its regulations the training necessary to qualify a supervisor or operator for certification for each type and class of plant. The state board may accept experience in lieu of qualification training. For supervisors and operators of water recycling treatment plants, the state board may approve use of a water treatment plant operator of appropriate grade certified by the State Department of Public Health pursuant to Article 3 (commencing with Section 106875) of Chapter 4 of Part 1 of Division 104 of the Health and Safety Code in lieu of a wastewater treatment plant operator certified by the state board, provided that the state board may refuse to approve use of an operator certified by the department or may suspend or revoke its approval of the use of an operator certified by the department if the operator commits any of the prohibited acts described in Article 7 (commencing with Section 3710) of Chapter 26 of Division 3 of Title 23 of the California Code of Regulations.

(b) The regional water quality control board, with jurisdiction for issuing and ensuring compliance with applicable water reclamation or waste discharge requirements, shall notify the

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department in writing if, pursuant to an inspection conducted under Section 13267, the regional board makes a determination that there are reasonable grounds for not issuing, or for suspending or revoking, the certificate of a certified water treatment plant operator who is operating or supervising the operation of a water recycling treatment plant. The department shall make its determination regarding the issuance, suspension, or revocation of a certificate in accordance with Section 106876 of the Health and Safety Code.

(c) For purposes of this section, “water recycling treatment plant” means a treatment plant that receives and further treats secondary or tertiary effluent, or both, from a wastewater treatment plant.

(d) A person employed as a wastewater treatment plant supervisor or operator on the effective date of regulations adopted pursuant to this chapter shall be issued an appropriate certificate if the person meets the training, education, and experience requirements prescribed by regulations.

(e) The state board may refuse to grant, suspend, or revoke any certificate issued by the state board to operate a wastewater treatment plant, or may place on probation, or reprimand, the certificate holder upon any reasonable ground, including, but not limited to, all of the following reasons:

- (1) Submitting false or misleading information on an application for a certificate.
- (2) The employment of fraud or deception in the course of operating the wastewater treatment plant.
- (3) A certificate holder’s failure to use reasonable care or judgment in the operation of the plant.
- (4) A certificate holder’s inability to perform operating duties properly.
- (5) Willfully or negligently violating, or causing, or allowing the violation of, waste discharge requirements or permits issued pursuant to the Federal Water Pollution Control Act (33 U.S.C. Sec. 1251 et seq.).

(f) The state board shall conduct all proceedings for the refusal to grant a certificate, and suspension or revocation of a certificate, pursuant to subdivision (e), in accordance with the rules adopted pursuant to Section 185.

Chapter 22. Graywater for Home Irrigation

§14875. Application of chapter

This chapter applies to the construction, installation, or alteration of graywater systems for subsurface irrigation and other safe uses.

§14875.1. Department definition

"Department" means the Department of Water Resources.

§14876. Graywater definition

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"Graywater" means untreated wastewater which has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and which does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes. Graywater includes wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines, and laundry tubs but does not include wastewater from kitchen sinks or dishwashers.

§14877. Graywater system definition

"Graywater system" means a system and devices, attached to the plumbing system for the sanitary distribution or use of graywater.

§14877.1. Consultation with CDPH on standards

(a) The department, in consultation with the State Department of Public Health and the Center for Irrigation Technology at California State University, Fresno, shall adopt standards for the installation of graywater systems. In adopting these standards, the department shall consider, among other resources, "Appendix J," as adopted on September 29, 1992, by the International Association of Plumbing and Mechanical Officials, the graywater standard proposed for the latest edition of the Uniform Plumbing Code of the International Association of Plumbing and Mechanical Officials, the City of Los Angeles Graywater Pilot Project Final Report issued in November 1992, and the advice of the Center for Irrigation Technology at California State University, Fresno, on the installation depth for subsurface drip irrigation systems.

(b) The department shall include among the approved methods of subsurface irrigation, but shall not be limited to, drip systems.

(c) The department shall revise its graywater systems standards as needed.

(d) The authority of the department under this chapter to adopt standards for residential buildings shall terminate upon the approval by the California Building Standards Commission of the standards submitted to that commission pursuant to Section 17922.12 of the Health and Safety Code.

§14877.2. Local administration

A graywater system may be installed if the city or county having jurisdiction over the installation determines that the system complies with standards adopted by the department.

§14877.3. City or county—more stringent

After a public hearing, a city or county may adopt, by ordinance, standards that prohibit the use of graywater or standards that are more restrictive than the standards adopted by the department, as appropriate for the local area.

* * * * *

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

SANTA ANA REGION

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ORDER NO. R8-2008-0004
NPDES NO. CA8000408

**WASTE DISCHARGE REQUIREMENTS
FOR THE
ORANGE COUNTY WATER DISTRICT
GROUNDWATER REPLENISHMENT SYSTEM
ADVANCED WATER TREATMENT FACILITY
EMERGENCY DISCHARGE TO REACH 1 OF SANTA ANA RIVER**

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

Table 1. Discharger Information

Discharger/Operator	Orange County Water District
Name of Facility	Groundwater Replenishment System--Advanced Water Treatment Facility (AWTF)
Facility Address	18700 Ward Street
	Fountain Valley, CA 92708
	Orange County
The U.S. Environmental Protection Agency (USEPA) and the Regional Water Quality Control Board have classified this discharge as a minor discharge.	

The discharge by the Orange County Water District from the discharge points identified below is subject to waste discharge requirements as set forth in this Order:

Table 2. Discharge Locations

Discharge Point	Effluent Description	Discharge Point Latitude	Discharge Point Longitude	Receiving Water
001	Tertiary treated effluent during emergency events, such as peak flows that approach or exceed the capacity of the discharge outfall and thereby threaten the integrity of the outfall	33°55'11"N	117°36'25"W	Reach 1 of the Santa Ana River

Table 3. Administrative Information

This Order was adopted by the Regional Water Quality Control Board on:	July 18, 2008
This Order shall become effective on:	July 18, 2008
This Order shall expire on:	July 1, 2013
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:	January 2, 2013

IT IS HEREBY ORDERED, that in order to meet the provisions contained in division 7 of the Water Code (commencing with section 13000) and regulations adopted thereunder and the provisions of the federal Clean Water Act (CWA) and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this Order.

I, Gerard J. Thibeault, 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, Santa Ana Region, on July 18, 2008.



Gerard J. Thibeault, Executive Officer

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I. FACILITY INFORMATION

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

Table 4. Facility Information

Discharger/Operator	Orange County Water District
Name of Facility	Groundwater Replenishment System--Advanced Water Treatment Facility (AWTF)
Facility Address	18700 Ward Street
	Fountain Valley, CA 92708
	Orange County
Facility Contact, Title, and Phone	Michael Wehner, Assistant General Manager, phone: (714) 378-3200
Mailing Address	P.O. Box 8300, Fountain Valley, CA 92728-8300
Type of Facility	Water Recycling Facility (Tertiary treatment only)
Facility Design Flow	100 million gallons per day (mgd)

II. FINDINGS

The California Regional Water Quality Control Board, Santa Ana Region (hereinafter Regional Water Board), finds:

A. Background. The Orange County Water District (hereinafter Discharger, or OCWD) submitted a Report of Waste Discharge (ROWD), dated March 20, 2007, and applied for a new NPDES permit to discharge up to 100 million gallons per day (mgd) of tertiary treated wastewater from its AWTF to Reach 1 of the Santa Ana River. The application was deemed complete in November 2007.

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 operates the Groundwater Replenishment System (GWRS). The GWRS is a joint project by OCWD and the Orange County Sanitation District (OCSD). The GWRS consists of three major components: Advanced Water Treatment Facility (hereinafter Facility, or AWTF), Talbert Gap Seawater Intrusion Barrier (Talbert Barrier), and Kraemer/Miller Spreading Basins. This Order will regulate discharges into the Santa Ana River from the AWTF. Other discharges from the GRWS are regulated under separate waste discharge requirements Order No. R8-2004-0002. Operation of the AWTF started in January 2008.

Secondary treated wastewater (secondary effluent) that would normally be discharged to the ocean will be diverted from OCSD Plant No. 1 to the GWRS AWTF, where, under normal operating conditions, it will receive advanced treatment to produce high quality recycled water for groundwater recharge in conformance with the requirements of Order No. R8-2004-0002 and subsequent amendments, and the California Code of Regulations Title 22 requirements. Under emergency conditions, such as peak wet weather flows in the OCSD system that exceed or may exceed the capacity of the ocean outfall, the secondary wastewater will be tertiary treated and discharged from DP 001 to Reach 1 of the Santa Ana River. The tertiary treatment consists of microfiltration, ultraviolet light treatment, and dechlorination (as needed) and pH adjustment (as needed). Reverse osmosis treatment will be by-passed when discharges are to the Santa Ana River.

The Santa Ana River is a water of the United States. Attachment B provides a map of the area around the Facility. Attachment C provides a flow schematic of the Facility.

- C. 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 a 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).
- D. Background and Rationale for Requirements.** The Regional Water Board developed the requirements in this Order based on information submitted as part of the application, through monitoring and reporting programs, and other available information. The Fact Sheet (Attachment F), which contains background information and the rationale for Order requirements, is hereby incorporated into this Order and constitutes part of the Findings for this Order. Attachments A through E and G through H are also incorporated into this Order.
- E. California Environmental Quality Act (CEQA).** Under Water Code section 13389, this action to adopt an NPDES permit is exempt from the provisions of CEQA, Public Resources Code section 21000 et seq. (*County of Los Angeles v. California State Water Resources Control Board* (2006) 143 Cal.App.4th 985, mod. (Nov. 6, 2006, B184034) 50 Cal.Rptr.3d 619, 632-636). A "Notice of Determination" was completed in March 1999.

F. Technology-based Effluent Limitations. Section 301(b) of the CWA and implementing USEPA permit regulations at section 122.44, title 40 of the Code of Federal Regulations¹, require that permits include conditions meeting applicable technology-based requirements at a minimum, and any more stringent effluent limitations necessary to meet applicable water quality standards. The discharge authorized by this Order must meet minimum federal technology-based requirements based on Secondary Treatment Standards at Part 133 and/or Best Professional Judgment (BPJ) in accordance with Part 125, section 125.3. A detailed discussion of the technology-based effluent limitations development is included in the Fact Sheet (Attachment F).

G. Water Quality-Based Effluent Limitations. Section 301(b) of the CWA and section 122.44(d) require that permits include limitations more stringent than applicable federal technology-based requirements where necessary to achieve applicable water quality standards. This Order contains requirements, expressed as a technology equivalence requirement, more stringent than secondary treatment requirements that are necessary to meet applicable water quality standards. The rationale for these requirements, which consist of tertiary treatment or equivalent requirements and other provisions, is discussed in the Fact Sheet.

Section 122.44(d)(1)(i) mandates that 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 has been 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: (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, as provided in section 122.44(d)(1)(vi).

H. Water Quality Control Plans. The Regional Water Board adopted a revised Water Quality Control Plan for the Santa Ana Region (hereinafter Basin Plan) that became effective on January 24, 1995. The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the Santa Ana Region addressed through the plan. More recently, the Basin Plan was amended significantly to incorporate revised boundaries for groundwater subbasins, now termed "management zones", new nitrate-nitrogen and TDS objectives for the new management zones, and new nitrogen and TDS management strategies applicable to both surface and ground waters.

¹ All further statutory references are to title 40 of the Code of Federal Regulations unless otherwise indicated.

This Basin Plan Amendment was adopted by the Regional Water Board on January 22, 2004. The State Water Resources Control Board (State Water Board) and Office of Administrative Law (OAL) approved the Amendment on September 30, 2004 and December 23, 2004, respectively. EPA approved the surface water standards components of the N/TDS Amendment on June 20, 2007.

In addition, the Basin Plan implements State Water Resources Control Board (State Water Board) Resolution No. 88-63, which established State policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the Santa Ana River are as follows:

Table 5. Basin Plan Beneficial Uses

Discharge Point	Receiving Water Name	Beneficial Use(s)
001	Reach 1 of Santa Ana River	Present or Potential: Water contact recreation, non-contact water recreation, and intermittent warm freshwater habitat and wildlife habitat. Excepted from Municipal and Domestic Supply.

Requirements of this Order implement the Basin Plan.

- I. National Toxics Rule (NTR) and California Toxics Rule (CTR).** USEPA adopted the NTR on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the CTR. The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.
- J. State Implementation Policy.** On March 2, 2000, the State Water Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP). The SIP became effective on April 28, 2000 with respect to the priority pollutant criteria promulgated for California by the USEPA through the NTR and to the priority pollutant objectives established by the Regional Water Board in the Basin Plan. The SIP became effective on May 18, 2000 with respect to the priority pollutant criteria promulgated by the USEPA through the CTR. The State Water Board adopted amendments to the SIP on February 24, 2005 that became effective on July 13, 2005. The SIP establishes implementation provisions for priority pollutant criteria and objectives and provisions for chronic toxicity control. Requirements of this Order implement the SIP.
- K. Compliance Schedules and Interim Requirements. - Not Applicable**

- L. Alaska Rule.** On March 30, 2000, USEPA revised its regulation that specifies when new and revised state and tribal water quality standards (WQS) become effective for CWA purposes. (40 C.F.R. section 131.21; 65 Fed. Reg. 24641 (April 27, 2000).) 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.
- M. Stringency of Requirements for Individual Pollutants.** This Order does not contain technology-based effluent limitations. However, this Order includes water quality based effluent limitations for individual pollutants. Water quality-based effluent limitations have been scientifically derived to implement water quality objectives that protect beneficial uses. Both the beneficial uses and the water quality objectives have been approved pursuant to federal law and are the applicable federal water quality standards. To the extent that toxic pollutant water quality-based effluent limitations were derived from the CTR, the CTR is the applicable standard pursuant to section 131.38. The scientific procedures for calculating the individual water quality-based effluent limitations for priority pollutants are based on the CTR-SIP, which was approved by USEPA on May 18, 2000. All beneficial uses and water quality objectives contained in the Basin Plan were approved under state law and submitted to and approved by USEPA prior to May 30, 2000. Any water quality objectives 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 section 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.
- N. Antidegradation Policy.** Section 131.12 requires that the 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. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Regional Water Board’s Basin Plan implements, and incorporates by reference, both the state and federal antidegradation policies.
- O. Anti-Backsliding Requirements.** Sections 402(o)(2) and 303(d)(4) of the CWA and federal regulations at title 40, Code of Federal Regulations section 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. The anti-backsliding provisions do not apply here since this is a new permit.

- P. 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 sections 2050 to 2097) or the Federal Endangered Species Act (16 U.S.C.A. sections 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 the applicable Endangered Species Act.
- Q. Monitoring and Reporting.** Section 122.48 requires that all NPDES permits specify requirements for recording and reporting monitoring results. Water Code sections 13267 and 13383 authorizes the Regional Water Board to require technical and monitoring reports. The Monitoring and Reporting Program establishes monitoring and reporting requirements to implement federal and State requirements. This Monitoring and Reporting Program is provided in Attachment E.
- R. Standard and Special Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with section 122.41, and additional conditions applicable to specified categories of permits in accordance with section 122.42, are provided in Attachment D. The Discharger must comply with all standard provisions and with those additional conditions that are applicable under section 122.42. The Regional 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 attached Fact Sheet.
- S. Provisions and Requirements Implementing State Law. Not Applicable**
- T. Notification of Interested Parties.** The Regional 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 of this Order.
- U. Consideration of Public Comment.** The Regional 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.

III. DISCHARGE PROHIBITIONS

- A.** Treated wastewater discharged at DP 001 shall be limited to tertiary treated and disinfected effluent during emergency conditions² that meets the conditions in Section IV.A.1.

² See definition of emergency discharge condition in Attachment A of this Order.

- B. Discharge of treated wastewater at a location or in a manner different from those described in this Order is prohibited, except as allowed by Order No. R8-2004-0002 and amendments thereto.
- C. The bypass or overflow of untreated wastewater or wastes to surface waters or surface water drainage courses is prohibited, except as allowed in Standard Provision I.G. of Attachment D, Federal Standard Provisions.
- D. The discharge of any substances in concentrations toxic to animal or plant life is prohibited.
- E. The discharge of any radiological, chemical, or biological warfare agent or high level radiological waste is prohibited.

IV. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

A. Effluent Limitations – Discharge Point 001

1. Final Effluent Limitations – Discharge Point 001

The discharge of treated and disinfected effluent at DP 001 shall maintain compliance with the following effluent limitations, with compliance measured at monitoring location M-001, as described in the attached MRP (Attachment E):

- a. The Discharge shall maintain compliance with the following effluent limitations at Discharge Point 001:

Table 6. Effluent Limitations at DP 001

Parameter	Units	Effluent Limitations				
		Average Monthly*	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Biochemical Oxygen Demand 5-day @ 20°C	mg/L	20	30	--	--	--
Total Suspended Solids	mg/L	20	30	--	--	--
pH	standard units	--	--	--	6.5	8.5
Total Chlorine Residual	mg/L	--	--	0.1	--	--
Total Recoverable Selenium	µg/L	4.1	--	8.2	--	--
Free Cyanide	µg/L	3.8	--	9.4	--	--

*: The average monthly effluent limitation (AMEL) applies only if discharges occur for more than one day in a calendar month period.

- b. The discharge at DP 001 shall not contain concentrations of total ammonia-nitrogen that exceed those values specified in Table 7 below corresponding to the pH of the discharge.

Table 7. Ammonia-N Effluent Limits at DP 001

pH	Maximum Daily (mg/L)	Average Monthly* (mg/L)
6.5	49	38
6.6	47	36
6.7	45	34
6.8	42	33
6.9	39	30
7.0	36	28
7.1	33	25
7.2	30	23
7.3	26	20
7.4	23	18
7.5	20	15
7.6	17	13
7.7	14	11
7.8	12	9.4
7.9	10	7.8
8.0	8.4	6.5
8.1	7.0	5.4
8.2	5.7	4.4
8.3	4.7	3.6
8.4	3.9	3.0
8.5	3.2	2.5

*: The AMEL applies only if discharges occur for more than one day in a calendar month period.

- c. The discharge shall at all times be adequately oxidized, filtered, and disinfected treated wastewater and shall meet the following limitations.
- (1) The turbidity of the filtered wastewater shall not exceed any of the following:
- (a) An average of 2 NTU within a 24-hour period;
 - (b) 5 NTU more than 5 percent of the time within a 24-hour period; and
 - (c) 10 NTU at any time.

(2) The disinfected effluent shall meet the following:

- (a) UV disinfection shall meet the requirements specified in the Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse, published by the National Water Research Institute, Second Edition, unless otherwise approved by the California Department of Public Health.
- (b) The daily average concentration of total coliform bacteria shall not exceed a Most Probable Number (MPN) of 2.2 total coliform bacteria per 100 milliliters (ml).

d. There shall be no visible oil and grease in the discharge.

B. Land Discharge Specifications – Not Applicable

C. Reclamation Specifications – Not Applicable

D. Stormwater Discharge Specifications - Not Applicable (see Attachment F for discussion)

V. RECEIVING WATER LIMITATIONS

A. Surface Water Limitations

1. Receiving water limitations are based upon water quality objectives contained in the Basin Plan. As such, they are a required part of this Order. The discharge shall not cause the following in Reach 1 of Santa Ana River and downstream:
 - a. Coloration of the receiving waters, which causes a nuisance or adversely affects beneficial uses.
 - b. Deposition of oil, grease, wax or other materials in the receiving waters in concentrations which result in a visible film or in coating objects in the water, or which cause a nuisance or affect beneficial uses.
 - c. An increase in the amounts of suspended or settleable solids in the receiving waters, which will cause a nuisance or adversely affect beneficial uses as a result of controllable water quality factors.
 - d. Taste or odor-producing substances in the receiving waters at concentrations, which cause a nuisance or adversely affect beneficial uses.
 - e. The presence of radioactive materials in the receiving waters in concentrations, which are deleterious to human, plant or animal life.
 - f. The depletion of the dissolved oxygen concentration below 5.0 mg/L.

- c. Neither the treatment nor the discharge of pollutants shall create a pollution, contamination, or nuisance as defined by Section 13050 of the CWC.
- d. The Discharger shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncomplying discharge.
- e. This Order may be modified, revoked and reissued, or terminated for cause including, but not limited to, the following:
 - (1) Violation of any terms or conditions of this Order;
 - (2) Obtaining this Order by misrepresentation or failure to disclose fully all relevant facts, or;
 - (3) In addition to any other grounds specified herein, this Order may be modified or revoked at any time if, on the basis of any data, the Regional Water Board determines that continued discharges may cause unreasonable degradation of the aquatic environment.
- f. If an effluent standard or discharge prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307 (a) of the Clean Water Act for a toxic pollutant which is present in the discharge, and such standard or prohibition is more stringent than any limitation for that pollutant in this Order, this Order may be modified or revoked and reissued to conform to the effluent standard or discharge prohibition.
- g. The Discharger shall file with the Regional Water Board a Report of Waste Discharge at least 180 days before making any material change in the character, location, or volume of the discharge. A material change includes, but is not limited to, the following:
 - (1) Adding a major industrial waste discharge to a discharge of essentially domestic sewage, or adding a new process or product by an industrial facility resulting in a change in the character of the waste.
 - (2) Significantly changing the disposal method or location, such as changing the disposal to another drainage area or water body.
 - (3) Significantly changing the method of treatment.
- h. The provisions of this Order are severable, and if any provision of this Order, or the application of any provision of this Order to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this Order, shall not be affected thereby.

- i. The Discharger shall maintain a copy of this Order at the site so that it is available to site operating personnel at all times. Key operating personnel shall be familiar with its content.
- j. If the Discharger demonstrates a correlation between the biological oxygen demand (BOD₅) and total organic carbon (TOC) concentrations in the effluent to the satisfaction of the Executive Officer, compliance with the BOD₅ limits contained in this Order may be determined based on analyses of the TOC of the effluent.
- k. In the event of any change in control or ownership of land or waste discharge facility presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be forwarded to the Regional Water Board.

B. Monitoring and Reporting Program (MRP) Requirements

The Discharger shall comply with the MRP, and future revisions thereto, in Attachment E of this Order. This monitoring and reporting program may be modified by the Executive Officer at any time during the term of this Order, and may include an increase in the number of parameters to be monitored, the frequency of the monitoring or the number and size of samples to be collected. Any increase in the number of parameters to be monitored, the frequency of the monitoring or the number and size of samples to be collected may be reduced back to the levels specified in the original monitoring and reporting program at the discretion of the Executive Officer.

C. Special Provisions

1. Reopener Provisions

- a. This Order will be reopened to address any changes in State or federal plans, policies or regulations that would affect the quality requirements for the discharges.
- b. This Order may be reopened to include effluent limitations for pollutants determined to be present in the discharge in concentrations that pose a reasonable potential to cause or contribute to violations of water quality objectives.
- c. This Order may be reopened and modified in accordance with the requirements set forth at 40 CFR 122 and 124, to include the appropriate conditions or limits to address demonstrated effluent toxicity based on newly available information, or to implement any EPA-approved new State water quality standards applicable to effluent toxicity.

- d. This Order may be reopened for modification, or revocation and reissuance, as a result of the detection of a reportable priority pollutant generated by special conditions included in this Order. These special conditions may be, but are not limited to, fish tissue sampling, whole effluent toxicity, monitoring requirements on internal waste stream(s), and monitoring for surrogate parameters. Additional requirements may be included in this Order as a result of the special condition monitoring data.

2. Special Studies, Technical Reports and Additional Monitoring Requirements - Not applicable

3. Best Management Practices and Pollution Prevention

a. Pollutant Minimization Program

- (1) The Discharger shall develop and conduct a Pollutant Minimization Program (PMP) as further described below when there is evidence (e.g., sample results reported as DNQ when the effluent limitation is less than the MDL, sample results from analytical methods more sensitive than those methods required by this Order, presence of whole effluent toxicity, health advisories for fish consumption, results of benthic or aquatic organism tissue sampling) that a priority pollutant is present in the effluent above an effluent limitation and either:
 - (c) A sample result is reported as DNQ and the effluent limitation is less than the RL; or
 - (d) A sample result is reported as ND and the effluent limitation is less than the MDL.
- (2) The PMP shall include, but not be limited to, the following actions and submittals acceptable to the Regional Water Board:
 - (a) An annual review and semi-annual monitoring of potential sources of the reportable priority pollutant(s), which may include fish tissue monitoring and other bio-uptake sampling;
 - (b) Quarterly monitoring for the reportable priority pollutant(s) in the influent to the wastewater treatment system;
 - (c) Submittal of a control strategy designed to proceed toward the goal of maintaining concentrations of the reportable priority pollutant(s) in the effluent at or below the effluent limitation;
 - (d) Implementation of appropriate cost-effective control measures for the reportable priority pollutant(s), consistent with the control strategy; and
 - (e) An annual status report that shall be sent to the Regional Water Board including:

- i. All PMP monitoring results for the previous year;
- ii. A list of potential sources of the reportable priority pollutant(s);
- iii. A summary of all actions undertaken pursuant to the control strategy;
and
- iv. A description of actions to be taken in the following year.

4. Construction, Operation and Maintenance Specifications – Not Applicable

5. Special Provisions for Municipal Facilities (POTWs Only) – Not Applicable

6. Other Special Provisions – Not Applicable

7. 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 priority 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 priority pollutant in the monitoring sample is greater than the effluent limitation and greater than or equal to the reporting level (RL).

B. Multiple Sample Data.

When determining compliance with an AMEL or MDEL for priority pollutants and more than one sample result is available, the Discharger shall compute the arithmetic mean unless the data set contains one or more reported determinations of “Detected, but Not Quantified” (DNQ) or “Not Detected” (ND). In those cases, 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.

C. Average Monthly Effluent Limitation (AMEL).

If the average (or when applicable, the median determined by subsection B above for multiple sample data) of daily discharges over a calendar month exceeds the AMEL for a given parameter, this will represent a single violation, though the Discharger will be considered out of compliance for each day of that month for that parameter (e.g., resulting in 31 days of non-compliance in a 31-day month). If only a single sample is taken during the calendar month and the analytical result for that sample exceeds the AMEL, the Discharger will be considered out of compliance for that calendar month. The Discharger will only be considered out of compliance for days when the discharge occurs. For any one calendar month during which no sample (daily discharge) is taken, no compliance determination can be made for that calendar month.

D. Average Weekly Effluent Limitation (AWEL).

If the average or when applicable, the median determined by subsection B above for multiple sample data of daily discharges over a calendar week exceeds the AWEL for a given parameter, this will represent a single violation, though the Discharger will be considered out of compliance for each day of that week for that parameter, resulting in 7 days of non-compliance. If only a single sample is taken during the calendar week and the analytical result for that sample exceeds the AWEL, the Discharger will be considered out of compliance for that calendar week. The Discharger will only be considered out of compliance for days when the discharge occurs. For any one calendar week during which no sample (daily discharge) is taken, no compliance determination can be made for that calendar week.

E. Maximum Daily Effluent Limitation (MDEL).

If a daily discharge or when applicable, the median determined by subsection B above for multiple sample data of a daily discharge exceeds the MDEL for a given parameter, the Discharger will be considered out of compliance for that parameter for that 1 day only within the reporting period. For any 1 day during which no sample is taken, no compliance determination can be made for that day.

F. Instantaneous Minimum Effluent Limitation.

If the analytical result of a single grab sample is lower than the instantaneous minimum effluent limitation for a parameter, the Discharger will be considered out of compliance for that parameter for that single sample. Non-compliance for each sample will be considered separately (e.g., the results of two grab samples taken within a calendar day that both are lower than the instantaneous minimum effluent limitation would result in two instances of non-compliance with the instantaneous minimum effluent limitation).

G. Instantaneous Maximum Effluent Limitation.

If the analytical result of a single grab sample is higher than the instantaneous maximum effluent limitation for a parameter, the Discharger will be considered out of compliance for that parameter for that single sample. Non-compliance for each sample will be considered separately (e.g., the results of two grab samples taken within a calendar day that both exceed the instantaneous maximum effluent limitation would result in two instances of non-compliance with the instantaneous maximum effluent limitation).

H. Priority Pollutants.

The Discharger shall be deemed out of compliance with an effluent limitation if the concentration of the priority pollutant in the monitoring sample is greater than the effluent limitation.

1. Compliance determination shall be based on the reporting level selected from minimum level (ML)³ specified in Attachment “H” of this Order, unless an alternative reporting level is approved by the Regional Water Board’s Executive Officer. When there is more than one ML value for a given substance, the Discharger shall select the ML value that is below the calculated effluent limitation, and use its associated analytical method, listed in Attachment “I” of this Order. If no ML value is below the effluent limitation, then the Regional Water Board will select as the reporting level the lowest ML value and its associated analytical method.
2. When determining compliance with an average monthly limit and more than one sample result is available in a month, the Discharger shall compute the arithmetic mean unless the data set contains one or more reported determinations of detected but not quantified (DNQ) or not detected (ND). In those cases, the Discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:
 - a. The data set shall be ranked from low to high, reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.
 - b. 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. If a sample result, or the arithmetic mean or median of multiple sample results, is below the reporting level, and there is evidence that the priority pollutant is present in the effluent above an effluent limitation and the Discharger conducts a pollutant minimization program (PMP)⁴ the Discharger shall not be deemed out of compliance.

³ *Minimum level is the concentration at which the entire analytical system must give a recognizable signal and acceptable 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.*

⁴ *The goal of the PMP shall be to reduce all potential sources of a priority pollutant(s) 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.*

I. Non-Priority Pollutants.

The discharge shall be considered to be in compliance with an effluent limitation that is less than or equal to the method detection limit (MDL) specified in 40 CFR 136 if the arithmetic mean of all test results for the monitoring period is less than the constituent effluent limitation. Analytical results that are less than the specified MDL shall be assigned a value of zero.

J. Compliance Determination

Compliance determinations shall be based on available analyses for the time interval associated with the effluent limitation. Where only one sample analysis is available in a specified time interval (e. g., monthly or weekly average), that sample shall serve to characterize the discharge for the entire interval. If quarterly sample results show noncompliance with the average monthly limit and that sample result is used for compliance determinations for each month of the quarter, then three separate violations of the average monthly limit shall be deemed to have occurred.

Compliance with a single effluent limitation which applies to a group of chemicals (e.g., PCBs), based on a single sample shall be determined by considering the concentrations of individual members of the group to be zero if the analytical response for the individual chemical falls below the method detection limit (MDL) for that chemical.

ATTACHMENT A – DEFINITIONS

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 = $\mu = \Sigma x / n$ 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.

Best Management Practices (BMPs) are methods, measures, or practices designed and selected to reduce or eliminate the discharge of pollutants to surface waters from point and nonpoint source discharges including storm water. BMPs include structural and non-structural controls, and operation and maintenance procedures, which can be applied before, during, and/or after pollution producing activities.

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.

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.

Criteria Continuous Concentration (CCC) equals the highest concentration of a pollutant to which aquatic life can be exposed for an extended period of time (4 days) without deleterious effects.

Criteria Maximum Concentration (CMC) equals the highest concentration of a pollutant to which aquatic life can be exposed for a short period of time without deleterious effects.

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.

Detected, but Not Quantified (DNQ) are those sample results less than the RL, but greater than or equal to the laboratory's MDL.

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).

Emergency Discharge Conditions: Are periods when the OCWD's Advanced Water Treatment Facility (AWTF) will provide flow relief when peak wastewater flows at Orange County Sanitation District approach the capacity of the ocean outfall and thereby threatening the integrity of the outfall and the wastewater treatment facility or when the Orange County Sanitation District ocean outfall is being repaired.

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.

Existing Discharger means any discharger that is not a new discharger. An existing discharger includes an "increasing discharger" (i.e., an existing facility with treatment systems in place for its current discharge that is or will be expanding, upgrading, or modifying its existing permitted discharge after the effective date of this Policy).

Infeasible means not capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.

Inland Surface Waters are all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

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).

Maximum Daily Effluent Limitation (MDEL) means the highest allowable daily discharge of a pollutant, over a calendar day (or 24-hour period). For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Daily Flow is the maximum flow sample of all samples collected in a calendar day.

MEC: Maximum Effluent Concentration.

Median is the middle measurement in a set of data. The median of a set of data is found by first arranging the measurements in order of magnitude (either increasing or decreasing order). If the number of measurements (n) is odd, then the median = $X_{(n+1)/2}$. If n is even, then the median = $(X_{n/2} + X_{(n/2)+1})/2$ (i.e., the midpoint between the $n/2$ and $n/2+1$).

Method Detection Limit (MDL) is the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero, as defined in title 40 of the Code of Federal Regulations, Part 136, Attachment B, revised as of July 3, 1999.

Minimum Level (ML) is the concentration 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.

Mixing Zone is a limited volume of receiving water that is allocated for mixing with a wastewater discharge where water quality criteria can be exceeded without causing adverse effects to the overall water body.

New Discharger includes any building, structure, facility, or installation from which there is, or may be, a discharge of pollutants, the construction of which commenced after the effective date of this Policy.

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. Discharges to ocean waters are regulated in accordance with the State Water Board's California Ocean Plan.

Objectionable Bottom Deposits are an accumulation of materials or substances on or near the bottom of a water body, which creates conditions that adversely impact aquatic life, human health, beneficial uses, or aesthetics. These conditions include, but are not limited to, the accumulation of pollutants in the sediments and other conditions that result in harm to benthic organisms, production of food chain organisms, or fish egg development. The presence of such deposits shall be determined by RWQCB(s) on a case-by-case basis.

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 a priority pollutant(s) 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 Regional 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.

Pollution Prevention means any action that causes a net reduction in the use or generation of a hazardous substance or other pollutant that is discharged into water and includes, but is not limited to, input change, operational improvement, production process change, and product reformulation (as defined in Water Code section 13263.3). Pollution prevention does not include actions that merely shift a pollutant in wastewater from one environmental medium to another environmental medium, unless clear environmental benefits of such an approach are identified to the satisfaction of the State or Regional Water Board.

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 Regional Water Board either from Appendix 4 of the SIP in accordance with section 2.4.2 of the SIP or established in accordance with section 2.4.3 of the SIP. 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 RL.

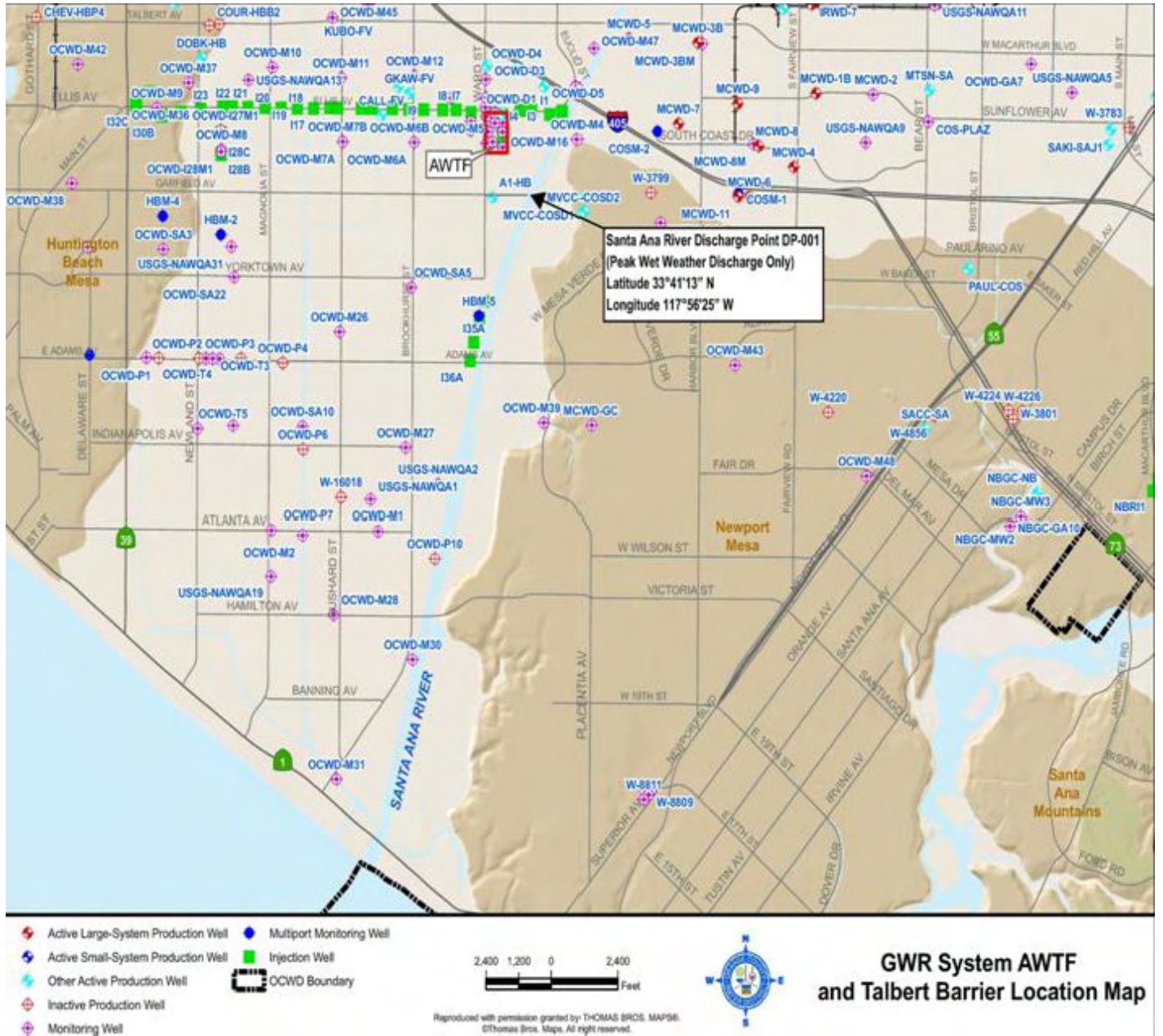
Satellite Collection System is the portion, if any, of a sanitary sewer system owned or operated by a different public agency than the agency that owns and operates the wastewater treatment facility that a sanitary sewer system is tributary to.

Use Attainability Analysis is a structured scientific assessment of the factors affecting the attainment of the use which may include physical, chemical, biological and economic factors as described in 40 CFR 131.10(g) (40 CFR 131.3, revised as of July 1, 1997).

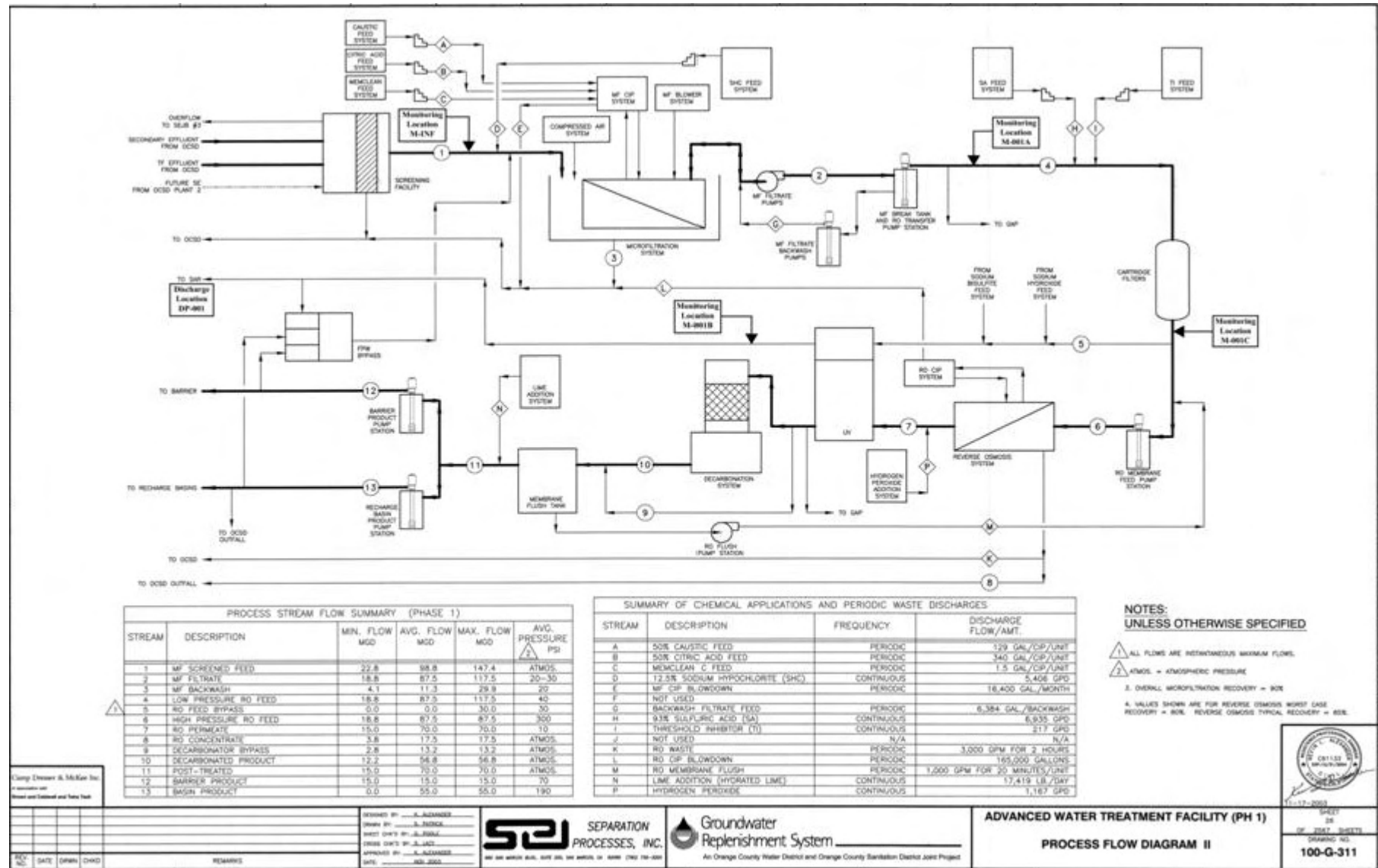
Water Effect Ratio (WER) is an appropriate measure of the toxicity of a material obtained in a site water divided by the same measure of the toxicity of the same material obtained simultaneously in a laboratory dilution water.

12-Month Running Average Effluent Limitation (12-MRAEL): the highest allowable average of monthly discharges over last twelve months, calculated as the sum of all monthly discharges measured during last twelve months divided by the number of monthly discharges measured during that time period.

ATTACHMENT B – LOCATION



ATTACHMENT C – FLOW SCHEMATIC



STREAM	DESCRIPTION	MIN. FLOW MGD	AVG. FLOW MGD	MAX. FLOW MGD	AVG. PRESSURE PSI
1	MF SCREENED FEED	22.8	38.8	147.4	ATMOS
2	MF FILTRATE	18.8	87.5	117.5	20-30
3	MF BACKWASH	4.1	11.3	29.8	20
4	LOW PRESSURE RO FEED	18.8	87.5	117.5	40
5	RO FEED BYPASS	0.0	0.0	30.0	30
6	HIGH PRESSURE RO FEED	18.8	87.5	87.5	300
7	RO PERMEATE	15.0	70.0	70.0	10
8	RO CONCENTRATE	3.8	17.5	17.5	ATMOS
9	DECARBONATOR BYPASS	2.8	13.2	13.2	ATMOS
10	DECARBONATED PRODUCT	12.2	56.8	56.8	ATMOS
11	POST-TREATED	15.0	70.0	70.0	ATMOS
12	BARRIER PRODUCT	15.0	15.0	15.0	70
13	BASIN PRODUCT	0.0	55.0	55.0	190

STREAM	DESCRIPTION	FREQUENCY	DISCHARGE FLOW/AMT.
A	50% CAUSTIC FEED	PERIODIC	129 GAL/CFP/LINE
B	50% SULFURIC ACID FEED	PERIODIC	340 GAL/CFP/LINE
C	MOLICULAR C FEED	PERIODIC	1.5 GAL/CFP/LINE
D	12.5% SODIUM HYPOCHLORITE (SHC)	CONTINUOUS	5,408 GPD
E	MF CIP BLOWDOWN	PERIODIC	18,400 GAL/MONTH
F	NOT USED		
G	BACKWASH FILTRATE FEED	PERIODIC	6,384 GAL/BACKWASH
H	93% SLS FLUORIC ACID (SA)	CONTINUOUS	6,935 GPD
I	THRESHOLD INHIBITOR (TI)	CONTINUOUS	217 GPD
J	NOT USED	N/A	
K	RO WASTE	PERIODIC	3,000 GPM FOR 2 HOURS
L	RO CIP BLOWDOWN	PERIODIC	165,000 GALLONS
M	RO MEMBRANE FLUSH	PERIODIC	1,000 GPM FOR 20 MINUTES/LINE
N	LIME ADDITION (HYDRATED LIME)	CONTINUOUS	17,419 LB./DAY
P	HYDROGEN PEROXIDE	CONTINUOUS	1,167 GPD

NOTES:
 UNLESS OTHERWISE SPECIFIED

- △ ALL FLOWS ARE INTERMEDIARY MAXIMUM FLOWS.
- △ ATMOS = ATMOSPHERIC PRESSURE
- △ OVERALL MICROFILTRATION RECOVERY = 80%
- △ OVERALL RO RECOVERY = 80%
- △ OVERALL REVERSE OSMOSIS TYPICAL RECOVERY = 85%

Clary Design & Millie Inc.
 Revision 01
 Final and Sealed and True Copy

DESIGNED BY: J. ALVARADO
 DRAWN BY: J. ALVARADO
 CHECKED BY: J. ALVARADO
 APPROVED BY: J. ALVARADO
 DATE: 08-20-08



ADVANCED WATER TREATMENT FACILITY (PH 1)
PROCESS FLOW DIAGRAM II
 SHEET 28 OF 2827 SHEETS
 DRAWING NO. 100-G-311



ATTACHMENT D –STANDARD PROVISIONS

I. STANDARD PROVISIONS – PERMIT COMPLIANCE

A. Duty to Comply

1. 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 and is grounds for enforcement action, for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. (40 C.F.R. § 122.41(a).)
2. 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 C.F.R. § 122.41(a)(1).)

B. 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 C.F.R. § 122.41(c).)

C. 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 C.F.R. § 122.41(d).)

D. 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 C.F.R. § 122.41(e).)

E. Property Rights

1. This Order does not convey any property rights of any sort or any exclusive privileges. (40 C.F.R. § 122.41(g).)

2. 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 C.F.R. § 122.5(c).)

F. Inspection and Entry

The Discharger shall allow the Regional 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 C.F.R. § 122.41(i); Wat. Code, § 13383):

1. 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 C.F.R. § 122.41(i)(1));
2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order (40 C.F.R. § 122.41(i)(2));
3. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order (40 C.F.R. § 122.41(i)(3)); and
4. 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 C.F.R. § 122.41(i)(4).)

G. Bypass

1. Definitions
 - a. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. (40 C.F.R. § 122.41(m)(1)(i).)
 - b. "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 C.F.R. § 122.41(m)(1)(ii).)
2. 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 Standard Provisions – Permit Compliance I.G.3, I.G.4, and I.G.5 below. (40 C.F.R. § 122.41(m)(2).)

3. Prohibition of bypass. Bypass is prohibited, and the Regional Water Board may take enforcement action against a Discharger for bypass, unless (40 C.F.R. § 122.41(m)(4)(i)):
 - a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage (40 C.F.R. § 122.41(m)(4)(i)(A));
 - b. There were no feasible alternatives to the bypass, such as the 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 C.F.R. § 122.41(m)(4)(i)(B)); and
 - c. The Discharger submitted notice to the Regional Water Board as required under Standard Provisions – Permit Compliance I.G.5 below. (40 C.F.R. § 122.41(m)(4)(i)(C).)
4. The Regional Water Board may approve an anticipated bypass, after considering its adverse effects, if the Regional Water Board determines that it will meet the three conditions listed in Standard Provisions – Permit Compliance I.G.3 above. (40 C.F.R. § 122.41(m)(4)(ii).)
5. Notice
 - a. 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 C.F.R. § 122.41(m)(3)(i).)
 - b. Unanticipated bypass. The Discharger shall submit notice of an unanticipated bypass as required in Standard Provisions - Reporting V.E below (24-hour notice). (40 C.F.R. § 122.41(m)(3)(ii).)

H. 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 C.F.R. § 122.41(n)(1).)

1. 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 Standard Provisions – Permit Compliance I.H.2 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 C.F.R. § 122.41(n)(2).)
2. 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 C.F.R. § 122.41(n)(3)):
 - a. An upset occurred and that the Discharger can identify the cause(s) of the upset (40 C.F.R. § 122.41(n)(3)(i));
 - b. The permitted facility was, at the time, being properly operated (40 C.F.R. § 122.41(n)(3)(ii));
 - c. The Discharger submitted notice of the upset as required in Standard Provisions – Reporting V.E.2.b below (24-hour notice) (40 C.F.R. § 122.41(n)(3)(iii)); and
 - d. The Discharger complied with any remedial measures required under Standard Provisions – Permit Compliance I.C above. (40 C.F.R. § 122.41(n)(3)(iv).)
3. Burden of proof. In any enforcement proceeding, the Discharger seeking to establish the occurrence of an upset has the burden of proof. (40 C.F.R. § 122.41(n)(4).)

II. STANDARD PROVISIONS – PERMIT ACTION

A. 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 C.F.R. § 122.41(f).)

B. 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 C.F.R. § 122.41(b).)

C. Transfers

This Order is not transferable to any person except after notice to the Regional Water Board. The Regional 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 C.F.R. § 122.41(l)(3); § 122.61.)

III. STANDARD PROVISIONS – MONITORING

- A.** Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. (40 C.F.R. § 122.41(j)(1).)
- B.** Monitoring results must be conducted according to test procedures under Part 136 or, in the case of sludge use or disposal, approved under Part 136 unless otherwise specified in Part 503 unless other test procedures have been specified in this Order. (40 C.F.R. § 122.41(j)(4); § 122.44(i)(1)(iv).)

IV. STANDARD PROVISIONS – RECORDS

- A.** 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 Part 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 Regional Water Board Executive Officer at any time. (40 C.F.R. § 122.41(j)(2).)

B. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements (40 C.F.R. § 122.41(j)(3)(i));
2. The individual(s) who performed the sampling or measurements (40 C.F.R. § 122.41(j)(3)(ii));
3. The date(s) analyses were performed (40 C.F.R. § 122.41(j)(3)(iii));
4. The individual(s) who performed the analyses (40 C.F.R. § 122.41(j)(3)(iv));
5. The analytical techniques or methods used (40 C.F.R. § 122.41(j)(3)(v)); and
6. The results of such analyses. (40 C.F.R. § 122.41(j)(3)(vi).)

C. Claims of confidentiality for the following information will be denied (40 C.F.R. § 122.7(b)):

1. The name and address of any permit applicant or Discharger (40 C.F.R. § 122.7(b)(1)); and
2. Permit applications and attachments, permits and effluent data. (40 C.F.R. § 122.7(b)(2).)

V. STANDARD PROVISIONS – REPORTING

A. Duty to Provide Information

The Discharger shall furnish to the Regional Water Board, State Water Board, or USEPA within a reasonable time, any information which the Regional 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 Regional Water Board, State Water Board, or USEPA copies of records required to be kept by this Order. (40 C.F.R. § 122.41(h); Wat. Code, § 13267.)

B. Signatory and Certification Requirements

1. All applications, reports, or information submitted to the Regional Water Board, State Water Board, and/or USEPA shall be signed and certified in accordance with Standard Provisions – Reporting V.B.2, V.B.3, V.B.4, and V.B.5 below. (40 C.F.R. § 122.41(k).)
2. All permit applications shall be signed by either a principal executive officer or ranking elected official. For purposes of this provision, a principal executive officer of a federal agency includes: (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of USEPA). (40 C.F.R. § 122.22(a)(3).)
3. All reports required by this Order and other information requested by the Regional Water Board, State Water Board, or USEPA shall be signed by a person described in Standard Provisions – Reporting V.B.2 above, or by a duly authorized representative of that person. A person is a duly authorized representative only if:
 - a. The authorization is made in writing by a person described in Standard Provisions – Reporting V.B.2 above (40 C.F.R. § 122.22(b)(1));

- b. 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 C.F.R. § 122.22(b)(2)); and
 - c. The written authorization is submitted to the Regional Water Board and State Water Board. (40 C.F.R. § 122.22(b)(3).)
4. If an authorization under Standard Provisions – Reporting V.B.3 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 Regional Water Board and State Water Board prior to or together with any reports, information, or applications, to be signed by an authorized representative. (40 C.F.R. § 122.22(c).)
 5. Any person signing a document under Standard Provisions – Reporting V.B.2 or V.B.3 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 C.F.R. § 122.22(d).)

C. Monitoring Reports

1. Monitoring results shall be reported at the intervals specified in the Monitoring and Reporting Program (Attachment E) in this Order. (40 C.F.R. § 122.22(l)(4).)
2. Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the Regional Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. (40 C.F.R. § 122.41(l)(4)(i).)
3. If the Discharger monitors any pollutant more frequently than required by this Order using test procedures approved under Part 136 or, in the case of sludge use or disposal, approved under Part 136 unless otherwise specified in Part 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 Regional Water Board. (40 C.F.R. § 122.41(l)(4)(ii).)

4. Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this Order. (40 C.F.R. § 122.41(l)(4)(iii).)

D. 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 C.F.R. § 122.41(l)(5).)

E. Twenty-Four Hour Reporting

1. 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 C.F.R. § 122.41(l)(6)(i).)
2. The following shall be included as information that must be reported within 24 hours under this paragraph (40 C.F.R. § 122.41(l)(6)(ii)):
 - a. Any unanticipated bypass that exceeds any effluent limitation in this Order. (40 C.F.R. § 122.41(l)(6)(ii)(A).)
 - b. Any upset that exceeds any effluent limitation in this Order. (40 C.F.R. § 122.41(l)(6)(ii)(B).)
3. The Regional 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 C.F.R. § 122.41(l)(6)(iii).)

F. Planned Changes

The Discharger shall give notice to the Regional 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 C.F.R. § 122.41(l)(1)):

1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in section 122.29(b) (40 C.F.R. § 122.41(l)(1)(i)); or

2. 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 C.F.R. § 122.41(l)(1)(ii).)
3. 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 C.F.R. § 122.41(l)(1)(iii).)

G. Anticipated Noncompliance

The Discharger shall give advance notice to the Regional 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 C.F.R. § 122.41(l)(2).)

H. Other Noncompliance

The Discharger shall report all instances of noncompliance not reported under Standard Provisions – Reporting V.C, V.D, and V.E above at the time monitoring reports are submitted. The reports shall contain the information listed in Standard Provision – Reporting V.E above. (40 C.F.R. § 122.41(l)(7).)

I. 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 Regional Water Board, State Water Board, or USEPA, the Discharger shall promptly submit such facts or information. (40 C.F.R. § 122.41(l)(8).)

VI. STANDARD PROVISIONS – ENFORCEMENT

- A. The Regional Water Board is authorized to enforce the terms of this permit under several provisions of the Water Code, including, but not limited to, sections 13385, 13386, and 13387.

VII. ADDITIONAL PROVISIONS – NOTIFICATION LEVELS

A. Publicly-Owned Treatment Works (POTWs)

All POTWs shall provide adequate notice to the Regional Water Board of the following (40 C.F.R. § 122.42(b)):

1. 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 C.F.R. § 122.42(b)(1)); and

2. 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 C.F.R. § 122.42(b)(2).)
3. 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 C.F.R. § 122.42(b)(3).)

ATTACHMENT E – MONITORING AND REPORTING PROGRAM

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ATTACHMENT E – MONITORING AND REPORTING PROGRAM (MRP)

The Code of Federal Regulations section 122.48 requires that all NPDES permits specify monitoring and reporting requirements. Water Code Sections 13267 and 13383 also authorize the Regional Water Quality Control Board (Regional 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. General Monitoring Provision

1. All sampling and sample preservation shall be in accordance with the current edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association) or 40CFR136. (revised as of April 11, 2007) "Guidelines Establishing Test Procedures for the Analysis of Pollutants," promulgated by the United States Environmental Protection Agency (EPA).
2. All laboratory analyses shall be performed in accordance with test procedures under 40 CFR 136 (revised as of April 11, 2007) "Guidelines Establishing Test Procedures for the Analysis of Pollutants," promulgated by the United States Environmental Protection Agency (EPA), unless otherwise specified in this MRP. In addition, the Regional Water Board and/or EPA, at their discretion, may specify test methods that are more sensitive than those specified in 40 CFR 136.
3. Chemical, bacteriological, and bioassay analyses shall be conducted at a laboratory certified for such analyses by the California Department of Public Health in accordance with the provision of Water Code Section 13176, or conducted at a laboratory certified for such analyses by the EPA or at laboratories approved by the Regional Water Board's Executive Officer.
4. Whenever the Discharger monitors any pollutant more frequently than is required by this Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the discharge monitoring report specified by the Executive Officer.
5. In conformance with federal regulations 40 CFR 122.45(c), analyses to determine compliance with the effluent limitations for metals shall be conducted using the total recoverable method. For Chromium (VI), the dissolved method in conformance with 40 CFR 136 may be used to measure compliance with the Chromium (VI) limitation.

6. For effluent wastewater monitoring:
- a. The Discharger shall require its testing laboratory to calibrate the analytical system down to the minimum level (ML)¹ specified in Attachment “H” for priority pollutants with effluent limitations in this Order, unless an alternative minimum level is approved by the Regional Water Board’s Executive Officer. When there is more than one ML value for a given substance, the Discharger shall use the ML values, and their associated analytical methods, listed in Attachment “H” that are below the calculated effluent limitation. The Discharger may select any one of those cited analytical methods for compliance determination. If no ML value is below the effluent limitation, then the lowest ML value and its associated analytical method, listed in Attachment “H” shall be used. Any internal quality control data associated with the sample must be reported when requested by the Executive Officer. The Regional Water Board will reject the quantified laboratory data if quality control data is unavailable or unacceptable.
 - b. The Discharger shall report the results of analytical determinations for the presence of chemical constituents in a sample using the following reporting protocols:
 - (1) 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).
 - (2) Sample results less than the reported ML, but greater than or equal to the laboratory’s current Method Detection Limit (MDL)², shall be reported as “Detected, but Not Quantified,” or “DNQ.” The estimated chemical concentration of the sample shall also be reported.
 - (3) Sample results not detected above the laboratory’s MDL shall be reported as “not detected” or “ND.”
 - c. The Discharger shall submit to the Regional Water Board reports necessary to determine compliance with effluent limitations in this Order and shall follow the chemical nomenclature and sequential order of priority pollutant constituents shown in Attachment “G” – Priority Pollutant Lists. The Discharger shall report with each sample result:

¹ *Minimum level is the concentration at which the entire analytical system must give a recognizable signal and acceptable 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.*

² *MDL is the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analytical concentration is greater than zero, as defined in 40 CFR 136, Appendix B, revised as of April 11, 2007.*

- (1) The reporting level achieved by the testing laboratory; and
 - (2) The laboratory's current MDL, as determined by the procedure found in 40 CFR 136 (revised as of April 11, 2007).
- d. For receiving water monitoring and for those priority pollutants without effluent limitations, the Discharger shall require its testing laboratory to quantify constituent concentrations to the lowest achievable MDL as determined by the procedure found in 40 CFR 136 (revised as of April 11, 2007). In situations where the most stringent applicable receiving water objective (freshwater or human health (consumption of organisms only), as specified for that pollutant in 40 CFR 131.38³ is below the minimum level value specified in Attachment "H" and the Discharger cannot achieve an MDL value for that pollutant below the ML value, the Discharger shall submit justification why a lower MDL value cannot be achieved. Justification shall be submitted together with monthly monitoring reports.
7. For non-priority pollutants monitoring, all analytical data shall be reported with method detection limits, as determined by the procedure found in 40 CFR 136 (revised as of April 11, 2007).
 8. The Discharger shall have, and implement an acceptable written quality assurance (QA) plan for laboratory analyses. Duplicate chemical analyses must be conducted on a minimum of ten percent (10%) of the samples, or at least one sample per month, whichever is greater. A similar frequency shall be maintained for analyzing spiked samples. When requested by the Regional Water Board or EPA, the Discharger will participate in the NPDES discharge monitoring report QA performance study.
 9. For every item of monitoring data where the requirements are not met, the monitoring report shall include a statement discussing the reasons for noncompliance, the actions undertaken or proposed that will bring the discharge into full compliance with requirements at the earliest time, and an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Water Board by letter when compliance with the time schedule has been achieved.
 10. The Discharger shall assure that records of all monitoring information are maintained and accessible for a period of at least five years (this retention period supercedes the retention period specified in Section IV.A. of Attachment D) from the date of the sample, report, or application. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge or by the request of the Regional Water Board at any time. Records of monitoring information shall include:
 - a. The information listed in Attachment D- IV Standard Provisions – Records, subparagraph B. of this Order;

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See Federal Register/ Vol. 65, No. 97 / Thursday, May 18, 2000 / Rules and Regulations.

- b. The laboratory which performed the analyses;
 - c. The date(s) analyses were performed;
 - d. The individual(s) who performed the analyses;
 - e. The modification(s) to analytical techniques or methods used;
 - f. All sampling and analytical results, including Units of measurement used;
 - (1) Minimum reporting level for the analysis (minimum level);
 - (2) Results less than the reporting level but above the method detection limit (MDL);
 - (3) Data qualifiers and a description of the qualifiers;
 - (4) Quality control test results (and a written copy of the laboratory quality assurance plan);
 - (5) Dilution factors, if used; and
 - (6) Sample matrix type.
 - g. All monitoring equipment calibration and maintenance records;
 - h. All original strip charts from continuous monitoring devices;
 - i. All data used to complete the application for this Order; and,
 - j. Copies of all reports required by this Order.
 - k. Electronic data and information generated by the Supervisory Control And Data Acquisition (SCADA) System.\
11. The flow measurement system shall be calibrated at least once per year or more frequently, to ensure continued accuracy.
12. Monitoring and reporting shall be in accordance with the following:
- a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
 - b. The monitoring and reporting of influent, effluent, and sludge shall be done more frequently as necessary to maintain compliance with this Order and or as specified in this order.
 - c. Whenever the Discharger monitors any pollutant more frequently than is required by this Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the discharge monitoring report specified by the Executive Officer.
 - d. A "grab" sample is defined as any individual sample collected in less than 15 minutes.
 - e. A composite sample is defined as a combination of no fewer than eight individual grab samples obtained over the specified sampling period. The volume of each individual grab sample shall be proportional to the discharge flow rate at the time of sampling. The compositing period shall equal the specific sampling period, or 24 hours, if no period is specified.
 - f. Daily samples shall be collected on each day of the week.

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 1 Monitoring Station Locations

Discharge Point Name	Monitoring Location Name	Monitoring Location Description	Latitude and Longitude
--	M-INF	Influent to Microfiltration System.	33° 41' 25" & 117° 56' 35"
001	M-001A	MF Effluent (Filtrate) header from MF Break Tank for subsequent transfer to UV during peak wet weather events and/or emergency events. M-001A monitors flow. M-001A is either of the two flow meters located on the 84" MFE header to the ROF chemical injection vault. M-001A is either FE/FIT-255-0430B or FE/FIT-255-0430A.	33° 41' 30" & 117° 56' 37"
001	M-001B	Advance treated effluent (MF/UV) to Reach 1 of Santa Ana River during peak wet weather events and/or emergency events. M-001B monitors chlorine residual and pH using continuous recorder. M-001B is also where grab samples are taken for coliform, NH3-N and any other lab analyses. M-001B is located downstream of UV and NaHSO3 addition (NaHSO3 is used as needed for dechlorination). M-001B is analyzer panel 805-CPD-0002.	33° 41' 22" & 117° 56' 39"
001	M-001C	Advance treated effluent (MF and cartridge filtrate) to UV for Santa Ana River discharge. M-001C monitors EC and turbidity using continuous recorder. M-001C is located downstream of MF and cartridge filters, and upstream of UV. M-001C is analyzer panel 450-CPF-0001.	33° 41' 27" & 117° 56' 39"
--	R-001U	Receiving surface water - Reach 1 of Santa Ana River, at least 100 feet upstream of outfall and/or at a distance where it safe and practical.	33° 41' 14" & 117° 56' 24"
--	R-001D	Receiving surface water - Reach 1 of Santa Ana River, at least 500 feet downstream of outfall and/or at a distance where it safe and practical.	33° 41' 08" & 117° 56' 27"

III. INFLUENT MONITORING REQUIREMENTS

A. Monitoring Location M-INF

1. Sampling stations shall be established for the points of inflow to the treatment plant. The sampling station(s) shall be located upstream of any in-plant return flows and where representative sample(s) of the influent to the treatment plant can be obtained.
2. The Discharger shall monitor the influent to the Facility at Monitoring Location M-INF as follows. If more than one analytical test method is listed for a given parameter, the Discharger must select from the listed methods and corresponding Minimum Level:

Table 2 Influent Monitoring M-INF

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow	mgd	Recorder/Totalizer	Continuous when discharging	See Section I.A.3, above, of this MRP
pH	pH Units	Recorder	Continuous when discharging	"
BOD ₅	mg/L	Composite	Once when discharging	
Total Suspended Solids	mg/L	Composite	Once when discharging	"
Oil and Grease	mg/L	Grab	Once when discharging	"
Ammonia Nitrogen	mg/L	Grab	Once when discharging	"
Total Recoverable Mercury	µg/L	Grab	Once when discharging	See Section I.A.2, I.A.3, above, of this MRP
Total Recoverable Selenium	µg/L	Grab	Once when discharging	"
Free Cyanide	µg/L	Grab	Once when discharging	"
Acrylonitrile	µg/L	Grab	Once when discharging	"
Benzidine	µg/L	Grab	Once when discharging	"
3,3-Dichlorobenzidine	µg/L	Grab	Once when discharging	"
1,2-Diphenylhydrazine	µg/L	Grab	Once when discharging	"

IV. EFFLUENT MONITORING REQUIREMENTS TO SURFACE WATER

The Discharger shall monitor the treated effluent at monitoring locations as follows. If more than one analytical test method is listed for a given parameter, the Discharger must select from the listed methods and corresponding Minimum Level.

A. Effluent Monitoring Locations M-001A, M-001B and M-001C

1. The Discharger shall monitor the treated effluent for DP 001 at Monitoring Locations M-001A, M-001B and M-001C as follows. Flow data are to be collected at M-001A. Turbidity data are to be collected at M-001C. Data on the remaining parameters are to be collected at M-001B.

Table 3 Treated Effluent Monitoring M-001

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method and Minimum Level, units, respectively
Flow	mgd	Recorder/ Totalizer	Continuous when discharging	See Section I.A.3. above, of this MRP
pH	pH units	Recorder	Continuous when discharging	See Section I.A.3. above, of this MRP
Turbidity ⁴	NTU	Recorder	Continuous when discharging	See Section I.A.3. above, of this MRP
Coliform Organisms ⁵	MPN per 100 ml ⁶	Grab	Daily when discharging	See Section I.A.3., above of this MRP
BOD ₅	mg/L	Grab	Daily when discharging	See Section I.A.3., above of this MRP
Total Suspended Solids	mg/L	Grab	Daily when discharging	See Section I.A.3., above of this MRP
Total Chlorine Residual	mg/L	Grab	Daily when discharging	See Sections I.A.3., above of this MRP
Total Ammonia Nitrogen	mg/L	Grab	Once when discharging	See Sections I.A.3., above of this MRP
Total Recoverable Mercury	µg/L	Grab	Once when discharging	See Sections I.A.2., I.A.3., above of this MRP, and RL 0.05 µg/L
Total Recoverable Selenium	µg/L	Grab	Once when discharging	See Sections I.A.2., I.A.3., above of this MRP and RL 2 µg/L
Free Cyanide	µg/L	Grab	Once when discharging	See Sections I.A.2., I.A.3., above of this MRP, and RL 5 µg/L
Acrylonitrile	µg/L	Grab	Once when discharging	See Sections I.A.2., I.A.3., above of this MRP
Benzidine	µg/L	Grab	Once when	See Sections I.A.2., I.A.3.,

⁴ *Turbidity analysis shall be continuous, performed by a continuous recording turbidimeter at M-001C. Compliance with the daily average operating filter effluent turbidity shall be determined by averaging the levels of recorded turbidity taken at a minimum of four-hour intervals over a 24-hour period. The results of the daily average turbidity determinations shall be reported monthly. Turbidity measurements shall be taken immediately after filtration.*

⁵ *Samples for total coliform bacteria shall be collected daily. Samples shall be taken from the disinfected effluent.*

⁶ *MPN/100mL = Most Probable Number per 100 milliliters.*

Table 3 Treated Effluent Monitoring M-001

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method and Minimum Level, units, respectively
			discharging	above of this MRP
3,3-Dichlorobenzidine	µg/L	Grab	Once when discharging	See Sections I.A.2., I.A.3., above of this MRP
1,2-Diphenylhydrazine	µg/L	Grab	Once when discharging	See Sections I.A.2., I.A.3., above of this MRP
EPA Priority Pollutants (See Attachment "G")	µg/L	Grab	Once a year when discharging	See Sections I.A.2., I.A.3., above of this MRP

V. LAND DISCHARGE MONITORING REQUIREMENTS – NOT APPLICABLE

VI. RECLAMATION MONITORING REQUIREMENTS – NOT APPLICABLE

VII. RECEIVING WATER MONITORING REQUIREMENTS – SURFACE WATER AND GROUNDWATER

A. Monitoring Location R-001U for Surface Water

1. The discharger shall monitor the receiving water at R-001U where representative samples can be obtained and monitored for the following constituents:

Table 4 Receiving Water Monitoring Requirements at R-001U

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Dissolved Oxygen	mg/L	Grab	Once when discharging	See Sections I.A.3. above of this MRP
Temperature	°C	"	"	See Sections I.A.3. above of this MRP
pH	pH unit	Grab	"	See Sections I.A.3. above of this MRP
Total Hardness	mg/L	Grab	"	See Sections I.A.3. above of this MRP
EPA Priority Pollutants	µg/L	"	"	See Section I.A.2., above, of this MRP

B. Monitoring Location R-001D for Surface Water:

1. The Discharger shall monitor the receiving water at R-001D where representative samples can be obtained and monitored for the following constituents:

Table 5 Receiving Water Monitoring at R-001D

Parameter	Units	Sample Type	Minimum Sampling & Testing Frequency	Required Analytical Test Method
Dissolved Oxygen	mg/L	Grab	Once when discharging	See Section I.A.3., above, of this MRP
Temperature	°C	Grab	"	See Section I.A.3., above, of this MRP
pH	pH unit	Grab	"	"
Color change, foam, deposition of material, odor	--	Observe	"	See Section I.A.3., above, of this MRP

C. Monitoring Requirements for Groundwater – Not Applicable

VIII. OTHER MONITORING REQUIREMENTS

A. Biosolids Monitoring - Not Applicable

B. Stormwater Monitoring- Not Applicable

C. Water Supply Monitoring – Not Applicable

D. Pretreatment Monitoring and Reporting – Not Applicable

IX. REPORTING REQUIREMENTS

A. General Monitoring and Reporting Requirements

1. The Discharger shall comply with all Standard Provisions (Attachment D) related to monitoring, reporting, and recordkeeping.
2. All analytical data shall be reported with method detection limit⁷ (MDLs) and with identification of either reporting level or limits of quantitation (LOQs) and must include quality assurance/quality control data with their reports.
3. Any internal quality control data associated with the sample must be reported when requested by the Executive Officer. The Regional Water Board will reject the quantified laboratory data if quality control data is unavailable or unacceptable.

⁷ The standardized test procedure to be used to determine the method detection limit (MDL) is given at Appendix B, 'Definition and Procedure for the Determination of the Method Detection Limit' of 40 CFR 136.

4. Discharge monitoring data shall be submitted in a format acceptable by the Regional Water Board. Specific reporting format may include preprinted forms and/or electronic media. The results of all monitoring required by this Order shall be reported to the Regional Water Board, and shall be submitted in such a format as to allow direct comparison with the limitations and requirements of this Order.
5. The Discharger shall tabulate the monitoring data to clearly illustrate compliance and/or noncompliance with the requirements of the Order.
6. The Discharger shall submit to the Regional Water Board reports necessary to determine compliance with effluent limitations in this Order and shall follow the chemical nomenclature and sequential order of priority pollutant constituents shown in Attachment “G” – Priority Pollutant Lists. The Discharger shall report with each sample result:
 - a. The reporting level achieved by the testing laboratory; and
 - b. The laboratory’s current MDL, as determined by the procedure found in 40 CFR 136 (revised as of April 11, 2007).
 - c. For receiving water monitoring and for those priority pollutants without effluent limitations, the Discharger shall require its testing laboratory to quantify constituent concentrations to the lowest achievable MDL as determined by the procedure found in 40 CFR 136 (revised as of April 11, 2007). In situations where the most stringent applicable receiving water objective (freshwater or human health (consumption of organisms only), as specified for that pollutant in 40 CFR 131.38⁸ is below the minimum level value specified in Attachment “H” and the Discharger cannot achieve an MDL value for that pollutant below or equal to the ML value, the Discharger shall submit justification why a lower MDL value cannot be achieved. Justification shall be submitted together with monthly monitoring reports.
7. For every item of monitoring data where the requirements are not met, the monitoring report shall include a statement discussing the reasons for noncompliance, and of the actions undertaken or proposed which will bring the discharge into full compliance with requirements at the earliest time, and an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Water Board by letter when compliance with the time schedule has been achieved.
8. The reports for June and December shall include a roster of plant personnel, including job titles, duties, and level of State certification for each individual.

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See Federal Register/ Vol. 65, No. 97 / Thursday, May 18, 2000 / Rules and Regulations.

9. At any time during the term of this Order when electronic submittal of monitoring reports has become the norm, the State or Regional Water Board may notify the Discharger to discontinue submittal of hard copies of reports. When such notification is given, the Discharger shall stop submitting hard copies of required monitoring reports.
10. The Discharger shall report monitoring results for specific parameters in accordance with the following table:

Table 6 Reporting Requirements

Parameter	Measurement
Flow	Daily total flow
pH	Daily High and daily low
Turbidity	Daily maximum

11. The Discharger shall file a written report with the Regional Board within ninety (90) days after the average dry-weather waste flow for any month equals or exceeds 75 percent of the design capacity of the waste treatment and/or disposal facilities. The Discharger's senior administrative officer shall sign a letter which transmits that report and certifies that the policy making body is adequately informed about it. The report shall include:
 - a. Average daily flow for the month, the date on which the instantaneous peak flow occurred, the rate of that peak flow, and the total flow for the day.
 - b. The Discharger's best estimate of when the average daily dry-weather flow rate will equal or exceed the design capacity of the treatment facilities.
 - c. The Discharger's intended schedule for studies, design, and other steps needed to provide additional capacity for the waste treatment and/or disposal facilities before the waste flow rate equals the capacity of present units.

B. Self Monitoring Reports (SMRs)

1. At any time during the term of this permit, the State or Regional Water Board may notify the Discharger to 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>). Until such notification is given, the Discharger shall submit hard copy SMRs. 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. Additionally, the Discharger shall report in the SMR the results of any special studies, acute and chronic toxicity testing, TRE/TIE, PMP, and Pollution Prevention Plan required by Special Provisions – VI.C. of this Order. The Discharger shall submit monthly, quarterly, 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 7 Monitoring Periods and Reporting Schedule

Sampling Frequency	Monitoring Period Begins On...	Monitoring Period	SMR Due Date
Continuous	The effective day of this Order	All	Submit when discharging; On the first day of the second month following the reporting period
Daily	The effective day of this Order	(Midnight through 11:59 PM) or any 24-hour period that reasonably represents a calendar day for purposes of sampling.	"
Weekly	The effective day of this Order	Sunday through Saturday	"
Monthly	First day of calendar month following permit effective date or on permit date if that date is first day of the month	1 st day of calendar month through last day of calendar month	first day of the second month following the reporting period, submit as monthly SMR
Annually	The effective day of this Order	January 1 through December 31	April 1 each year including report requirements in Attachments

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 Part 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 RL, 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. Multiple Sample Data. When determining compliance with an AMEL for priority pollutants and more than one sample result is available in a month, the Discharger shall compute the arithmetic mean unless the data set contains one or more reported determinations of "Detected, but Not Quantified" (DNQ) or "Not Detected" (ND). In those cases, the Discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:
 - a. 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.
 - b. 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.
 6. The Discharger shall submit hard copy SMRs (with an original signature) when required by subsection B.1 above in accordance with the following requirements:
 - a. The Discharger shall arrange all reported data in a tabular format. The data shall be summarized to clearly illustrate whether the facility is operating in compliance with interim and/or final effluent limitations.

- b. The Discharger shall attach a cover letter to the SMR. The information contained in the cover letter shall clearly identify violations of the WDRs; 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. SMRs must be submitted to the Regional Water Board, signed and certified as required by the Standard Provisions (Attachment D), to the address listed below:

California Regional Water Quality Control Board
Santa Ana Region
3737 Main Street, Suite 500
Riverside, CA 92501-3348
7. The Discharger shall attach a cover letter to the SMR. The information contained in the cover letter shall clearly identify violations of the WDRs; 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.
8. By April 1 of each year, the Discharger shall submit an annual report to the Regional Water Board. The annual report shall include the following:
 - a. Tabular and graphical summaries of the monitoring data obtained during the previous year;
 - b. A discussion of the compliance record and the corrective actions taken or planned, which may be needed to bring the discharge into full compliance with the waste discharge requirements;
 - c. A summary of the quality assurance (QA) activities for the previous year; and
 - d. For priority pollutant constituents that do not have effluent limitations but are required to be monitored, the Discharger shall evaluate the monitoring data obtained during the previous year and determine whether detected constituents are at levels that would warrant reopening the permit to include effluent limitations for such constituent(s). To conduct this evaluation, the concentration of detected constituents shall be compared to the most stringent applicable receiving water objectives (freshwater or human health (consumption of organisms only) as specified for that pollutant in 40 CFR 131.38⁹). The Discharger shall include a discussion of the corrective actions taken or planned to address values above receiving water objectives.

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See Federal Register/ Vol. 65, No. 97 / Thursday, May 18, 2000 / Rules and Regulations.

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 Regional 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 Discharger shall submit the original DMR and one copy of the DMR to the address listed below:

Table 8 Monitoring Reporting Submittal

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, 15th 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 will not be accepted unless they follow the exact same format of EPA Form 3320-1.

Regional Administrator
 U. S. Environmental Protection Agency
 Region 9 – Attention WTR – 7
 75 Hawthorne Street
 San Francisco, CA 94105

D. Other Reports – Not Applicable

ATTACHMENT F – FACT SHEET

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ATTACHMENT F – FACT SHEET

As described in section II of this 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 1. Facility Information

WDID	8 303545001
Discharger/Operator	Orange County Water District
Name of Facility	Groundwater Replenishment System--Advanced Water Treatment Facility (AWTF)
Address	18700 Ward Street
	Fountain Valley, CA 92708
	Orange County
Authorized Person to Sign and Submit Reports	Michael Wehner, Assistant General Manager, phone: (714) 378-3200
Mailing Address	18700 Ward Street, Fountain Valley, CA 92708
Billing Address	P.O. Box 8300, Fountain Valley, CA 92728-8300
Type of Facility	Water Recycling Facility (Tertiary Treatment only)
Major or Minor Facility	Minor
Threat to Water Quality	III
Complexity	B
Pretreatment Program	N
Reclamation Requirements	N
Facility Permitted Flow	100 million gallons per day (mgd)
Facility Design Flow	70 mgd, peak design flow 100 mgd
Watershed	Santa Ana River watershed
Receiving Water	Reach 1, Santa Ana River
Receiving Water Type	Inland Surface Water

- A.** The Orange County Water District (hereinafter Discharger, or OCWD) operates the Groundwater Replenishment System (GWRS). The GWRS is a joint project by OCWD and Orange County Sanitation District (OCSD). The GWRS will, in part, provide hydraulic peak flow relief for the OCSD ocean outfall. The GWRS consists of three major components: Advanced Water Treatment Facility (hereinafter Facility or AWTF), Talbert Gap Seawater Intrusion Barrier (Talbert Barrier), and Kraemer/Miller Spreading Basins. This Order will regulate discharges from the AWTF into Reach 1 of the Santa Ana River under emergency conditions to provide flow relief when peak wastewater flows at OCSD approach the capacity of the ocean outfall and thereby threaten the integrity of the outfall and the wastewater treatment facilities or when the OCSD ocean outfall is being repaired. Other discharges from the GRWS, which are used to maintain the Talbert Gap seawater intrusion barrier and to recharge the Orange County groundwater basin, are regulated under separate waste discharge requirements Order No. R8-2004-0002 and amendments thereto. Operation of the AWTF started in January 2008.

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.** High wastewater flows approaching the maximum capacity of the OCSD outfall can occur and are typically caused by peak wet weather storm events. It is anticipated that storm events creating peak wastewater flows may occur infrequently and may last approximately 12 hours each, about once every three years based on flow projections for the year 2020. During such events, the Santa Ana River will likely convey storm water to the ocean and provide dilution of the AWTF discharge. The amount of flow in the river is likely to be highly variable depending on the location, duration and intensity of the storm and the performance of upstream flood control facilities.

Under emergency conditions, including peak wastewater flow events at OCSD that approach the maximum capacity of OCSD’s ocean outfall, secondary treated wastewater flows from OCSD’s Fountain Valley Reclamation Plant No. 1¹ will be diverted to the AWTF for further treatment and discharge to Reach 1 of the Santa Ana River. During these peak wastewater flow conditions, the AWTF will provide up to 100 mgd of flow relief for OCSD. The AWTF will treat secondary effluent flows of up to 128 mgd from Plant No. 1 using microfiltration (MF) and ultraviolet light (UV) disinfection (bypassing reverse osmosis (RO)), followed by post-treatment chemical addition as needed for pH adjustment. The microfiltered, disinfected tertiary effluent will be dechlorinated (as needed) prior to being discharged to Reach 1 of the Santa Ana River via a separate pipeline that will terminate at the Santa Ana River channel at Garfield Avenue in Fountain Valley (DP 001). Reach 1 of the Santa Ana River is tributary to the Pacific Ocean (about 4 miles from discharge point). Both the Santa Ana River and the Pacific Ocean are waters of the United States.

¹ OCSD’s Fountain Valley Reclamation Plant No. 1 currently discharges a combined primary and secondary treated effluent to the Ocean. Plant No. 1 discharges to the Ocean are regulated under Order No. R8-2004-0062, NPDES No. CA0110604. Plant No. 1 is adjacent the OCWD’s GWRS AWTF.

- C. The Discharger filed a report of waste discharge and submitted an application for Waste Discharge Requirements (WDRs) and National Pollutant Discharge Elimination System (NPDES) permit on March 20, 2007. Supplemental Information was requested starting September 2007. The latest supplemental information was received on April 2008.

II. FACILITY DESCRIPTION

A. Description of Wastewater Treatment or Controls

1. The GWR System:

The Groundwater Replenishment System is a water supply project, jointly sponsored by OCWD and Orange County Sanitation District (OCSD), that will supplement existing water supplies by providing a new, reliable, high-quality source of water to recharge the Orange County Groundwater Basin and protect the Basin from further degradation due to seawater intrusion. In addition, OCSD will rely upon the GWRS to provide peak wet weather flow relief for OCSD's ocean outfall. The GWR System is located in central Orange County and extends from Fountain Valley and Huntington Beach near the coast to Santa Ana, Orange, and Anaheim, generally near the Santa Ana River.

Secondary treated effluent that would normally be discharged to the ocean will be diverted from OCSD Plant No. 1 to the GWR System AWTF, where it is advanced treated to meet the California Code of Regulations Title 22 requirements for groundwater recharge during normal operating conditions and/or discharged to the Reach 1 of the Santa Ana River under emergency conditions. As discussed above, the GWR System consists of three major components. However, the focus of this Order is on the AWTF's discharges to the Santa Ana River.

2. AWTF Design Capacity and Wastewater Treatment

The AWTF is located at 18700 Ward Street,, Fountain Valley in Orange County. It includes treatment processes and pumping stations. The AWTF treatment design capacity is 70 million gallons per day (mgd) for recycled water production, while peak design influent flow rate is 128 mgd. Construction of this Facility is completed and operation for recycled water production started in January 2008.

The advanced treatment processes are as follows.

- a **Fine Screening:** Secondary treated wastewater from OCSD's Reclamation Plant No. 1 will be strained, or passed through rotating band fine-mesh screens, and chlorinated (as needed) prior to microfiltration. Screenings will be dewatered and returned to OCSD for disposal.

- b **Microfiltration:** Screened secondary effluent will flow via gravity to 26 in-basin microfiltration (MF) cells containing submerged racks of hollow fiber membranes with a maximum pore size of 0.2 micron. Sodium hypochlorite is added as-needed to the MF feed to form a low level (3-5 mg/L) of chloramine to reduce/prevent fouling of the MF membranes. The nominal rated filtrate production capacity of the MF system will be 86 mgd, with peak capacity at 100 mgd. The waste backwash will be returned to OCSD for treatment.
- c **Reverse Osmosis.** The RO process will be bypassed when AWTF effluent is discharged to the Santa Ana River.
- d **Advanced Oxidation/UV Disinfection:** The advanced oxidation/disinfection process (AOP) consists of two steps: hydrogen peroxide addition and ultraviolet (UV) light treatment. UV irradiation is used for disinfection and reduction of light-sensitive contaminants. Hydrogen peroxide exposed to UV irradiation produces hydroxyl radicals that result in advanced oxidation to destroy UV-resistant contaminants. For direct discharge to the SAR, only UV treatment will be used. The nominal capacity of the UV system, including standby trains, is 100 mgd.
- e **Dechlorination and pH adjustment:** After UV disinfection and prior to discharge to the Santa Ana River, the effluent stream may still contain some chloramines. Sodium bisulfate will be added for dechlorination, if needed.

Approximately 28 mgd of waste backwash, brine and start-up discharges will be returned to Orange County Sanitation District's Plant No. 1. Waste backwash, brine and start-up discharges will not be discharged to the Santa Ana River, even under emergency conditions or during discharge system testing periods.

Attachment B provides a map of the area around this Facility.
Attachment C provides a treatment flow schematic for this Facility.

B. Discharge Points and Receiving Waters

1. Discharge Point to Surface Water

Up to 100 mgd of tertiary treated wastewater will be discharged to the Santa Ana River via DP 001. The DP 001 is located about four miles upstream of the mouth of the Santa Ana River at the Pacific Ocean.

2. Receiving Water

Advanced treated wastewater from the Facility will be discharged to Reach 1 of the Santa Ana River and then to the Pacific Ocean, which are waters of the United States. The Pacific Ocean is approximately four miles away from the discharge point.

Table 2. Summary of Discharge Point and Receiving Waters

Discharge Serial No.	Latitude	Longitude	Description and Receiving Waters	Flow & Frequency
001	33°55'11"N	117°36'25"W	Reach 1 of the Santa Ana River.	100 mgd, about once every 3 years

C. Summary of Self-Monitoring Report (SMR) Data – Pilot Study

1. Effluent monitoring data collected during the AWTF pilot study are listed here.

Table 3. Summary of Pilot Study Effluent Monitoring Data

Parameter (units)	Monitoring Data (From 2005 – To 2007)			
	Highest Average Monthly Discharge	Highest Average Weekly Discharge	Highest Daily Discharge	Highest 12-Month Average
pH (SU)			7.7	
Coliform Organisms (MPN/100 mL)		<2.2		
Ammonia-Nitrogen (mg/L)			33.5	21.2
TDS (mg/L)				909
Total Hardness (mg/L)				254
Selenium (µg/L)			8.0	
Cyanide, Free (µg/L)			74	
Mercury (µg/L)			<0.05	
Copper (µg/L)			19	
Nickel (µg/L)			24	
Zink (µg/L)			51	
Acrylonitrile (µg/L)			<10	
Benzidine (µg/L)			<25	
3,3-Dichloro-benzidine (µg/L)			<10	
1,2-Diphenyl-hydrazine (µg/L)			<25	

3. Monitoring data from AWTF pilot study were used in the reasonable potential analysis. (see Section IV.C.3., below)

D. Compliance Summary—Not Applicable

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 a NPDES permit for point source discharges from this Facility to surface waters.

B. California Environmental Quality Act (CEQA)

Under Water Code section 13389, this action to adopt an NPDES permit is exempt from the provisions of CEQA, Public Resources Code section 21000 et seq. (*County of Los Angeles v. California State Water Resources Control Board* (2006) 143 Cal.App.4th 985, mod. (Nov. 6, 2006, B184034) 50 Cal.Rptr.3d 619, 632-636.)

C. State and Federal Regulations, Policies, and Plans

- 1. Water Quality Control Plans.** The Regional Water Board adopted an updated Water Quality Control Plan for the Santa Ana Basin (hereinafter Basin Plan) that became effective on January 24, 1995. The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. In addition, State Water Resources Control Board (State Water Board) Resolution No. 88-63 (Sources of Drinking Water Policy) requires that, with certain exceptions, the Regional Water Board assign the municipal and domestic water supply use to water bodies. Based on the exception criteria specified in Resolution No. 88-63, the Regional Water Board excepted Reach 5 (starting from Orange Avenue in the City of Redlands) of the Santa Ana River and downstream reaches, including Reach 1 from the municipal and domestic supply beneficial use.

On January 22, 2004, the Regional Water Board adopted Resolution No. R8-2004-0001, amending the Basin Plan to incorporate revised boundaries for groundwater subbasins, now termed “management zones”, new nitrate-nitrogen and TDS objectives for the new management zones, and new nitrogen and TDS management strategies applicable to both surface and ground waters. The State Water Board and Office of Administrative Law (OAL) approved the N/TDS Amendment on September 30, 2004 and December 23, 2004, respectively. EPA approved the surface water standards components of the N/TDS Amendment on June 20, 2007.

The designated beneficial uses of receiving waters affected by the discharge from the Facility are as follows:

Table 4. Basin Plan Beneficial Uses

Discharge Point	Receiving Water Name	Beneficial Use(s)
001	Reach 1 of Santa Ana River	<p><u>Present or Potential:</u> Water contact recreation, non-contact water recreation, and intermittent beneficial uses in warm freshwater habitat and wildlife habitat. Excepted from Municipal and Domestic Supply.</p>

Requirements of this Order implement the Basin Plan.

- 2. National Toxics Rule (NTR) and California Toxics Rule (CTR).** USEPA adopted the NTR on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the CTR. The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.
- 3. State Implementation Policy.** On March 2, 2000, the State Water Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP). The SIP became effective on April 28, 2000 with respect to the priority pollutant criteria promulgated for California by the USEPA through the NTR and to the priority pollutant objectives established by the Regional Water Board in the Basin Plan. The SIP became effective on May 18, 2000 with respect to the priority pollutant criteria promulgated by the USEPA through the CTR. The State Water Board adopted amendments to the SIP on February 24, 2005 that became effective on July 13, 2005. The SIP establishes implementation provisions for priority pollutant criteria and objectives and provisions for chronic toxicity control. Requirements of this Order implement the SIP.

- 4. Alaska Rule.** On March 30, 2000, USEPA revised its regulation that specifies when new and revised state and tribal water quality standards (WQS) become effective for CWA purposes (40 C.F.R. § 131.21, 65 Fed. Reg. 24641 (April 27, 2000)). 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.** Section 131.12 requires that the 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. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The Regional 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 provision of section 131.12 and State Water Board Resolution No. 68-16. Because of the limited expected frequency and duration of the discharge, the discharge will not result in a significant lowering of water quality. Therefore, the discharge is in conformance with the antidegradation policy.
- 6. Anti-Backsliding Requirements.** Sections 402(o)(2) and 303(d)(4) of the CWA and federal regulations at title 40, Code of Federal Regulations² section 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require that effluent limitations in a reissued permit must be as stringent as those in the previous permit, with some exceptions in which limitations may be relaxed. This permit is a new NPDES permit and the anti-backsliding provisions do not apply.
- 7. Monitoring and Reporting Requirements.** Section 122.48 of 40 CFR requires that all NPDES permits specify requirements for recording and reporting monitoring results. Sections 13267 and 13383 of the CWC authorize the Regional Water Board to require technical and monitoring reports. The Monitoring and Reporting Program (MRP) establishes monitoring and reporting requirements to implement federal and State requirements. This MRP is provided in Attachment E.

D. Impaired Water Bodies on CWA 303d) List – Not Applicable

E. Other Plans, Polices and Regulations-Not Applicable

² All further statutory references are to title 40 of the Code of Federal Regulations unless otherwise indicated.

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. There are two principal bases for effluent limitations in the Code of Federal Regulations: section 122.44(a) requires that permits include applicable technology-based limitations and standards; and section 122.44(d) requires that permits include water quality-based effluent limitations to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water

A. Discharge Prohibitions

The discharge prohibitions are based on the Federal Clean Water Act, Basin Plan, State Water Board's plans and policies, U.S. Environmental Protection Agency guidance and regulations.

B. Technology-Based Effluent Limitations

1. Scope and Authority

Section 301(b) of the CWA and implementing USEPA permit regulations at section 122.44, title 40 of the Code of Federal Regulations, require that permits include conditions meeting applicable technology-based requirements at a minimum, and any more stringent effluent limitations necessary to meet applicable water quality standards. The discharge authorized by this Order must meet minimum federal technology-based requirements based on Secondary Treatment Standards at Part 133 and/or Best Professional Judgment (BPJ) in accordance with Part 125, section 125.3.

Regulations promulgated in 40 CFR §125.3(a)(1) require technology-based effluent limitations for municipal dischargers to be placed in waste discharge requirements based on Secondary Treatment Standards or Equivalent to Secondary Treatment Standards.

The Federal Water Pollution Control Act Amendments of 1972 (PL 92-500) established the minimum performance requirements for POTWs [defined in Section 304(d)(1)]. Section 301(b)(1)(B) of that Act requires that such treatment works must, as a minimum, meet effluent limitations based on secondary treatment as defined by the USEPA Administrator.

Based on this statutory requirement, USEPA developed secondary treatment regulations, which are specified in 40 CFR Part 133. These technology-based regulations apply to all municipal wastewater treatment plants and identify the minimum level of effluent quality attainable by secondary treatment in terms of biochemical oxygen demand (BOD₅), total suspended solids (TSS), and pH.

2. Applicable Technology-Based Effluent Limitations

This Facility meets the technology-based regulations for the minimum level of effluent quality attainable by secondary treatment in terms of BOD₅, total suspended solids and removal rate as summarized in the Table 5 below. Secondary treated wastewater that meets the limitations specified in Table 5, below, will be diverted to the Facility from OCSD’s Plant No. 1 Water Reclamation Facility and subjected to additional treatment prior to re-use or, under emergency conditions, discharge to the Santa Ana River (pursuant to the requirements of this Order.)

Table 5. Summary of Technology-Based Effluent Limits for Secondary Treatment

Constituent	Average Weekly (mg/L)	Average Monthly (mg/L)	Average Monthly Removal Rate %
Biochemical Oxygen Demand, 5-day 20 ⁰ C	45	30	85
Total Suspended Solids	45	30	85

C. Water Quality-Based Effluent Limitations (WQBELs) for DP 001

1. Scope and Authority

Section 301(b) of the CWA and section 122.44(d) require that permits include limitations more stringent than applicable federal technology-based requirements where necessary to achieve applicable water quality standards.

Section 122.44(d)(1)(i) mandates that 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 has been 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: (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, as provided in section 122.44(d)(1)(vi).

The process for determining reasonable potential and calculating WQBELs when necessary is intended to protect the designated uses of the receiving water as specified in the Basin Plan, and achieve applicable water quality objectives and criteria that are contained in other state plans and policies, or any applicable water quality criteria contained in the CTR and NTR, and in the California Ocean Plan.

2. Applicable Beneficial Uses and Water Quality Criteria and Objectives

- a. **The Basin Plan** specifies narrative and numeric water quality objectives applicable to surface water as follows.

Table 6. Applicable Basin Plan Surface Water Quality Objectives

Constituents	Basis for Limitations
Chlorine, Residual	Wastewater disinfection with chlorine usually produces a chlorine residual. Chlorine and its reaction products are toxic to aquatic life. To protect aquatic life, the chlorine residual in wastewater discharged to inland surface waters shall not exceed 0.1 mg/L.
pH	The pH of inland surface water shall not be raised above 8.5 or depressed below 6.5 as a result of controllable water quality factors.

- b. **NTR, CTR and SIP.** The National Toxics Rule, California Toxics Rule (CTR) and State Implementation Policy specify numeric objectives for toxic substances and the procedures whereby these objectives are to be implemented. The procedures include those used to conduct reasonable potential analysis to determine the need for effluent limitations for priority and non-priority pollutants.

c. Requirement to meet 2.2 total coliform bacteria limit in the effluent

Article 3, Section 60305 of Title 22, Chapter 3, "Use of Recycled water for impoundments" of the California Code of Regulations specifies that recycled water used as a source of supply in a nonrestricted recreational impoundment shall be at all times an adequately disinfected, oxidized, coagulated, clarified, filtered wastewater (tertiary treated). The degree of treatment specified represents an approximately 5-log reduction in the virus content of the water. The California State Department of Public Health (CDPH) has determined that this degree of virus removal is necessary to protect the health of people using these impoundments for water contact recreation. The CDPH has developed wastewater disinfection guidelines ("Wastewater Disinfection for Health Protection", Department of Health Services, Sanitary Engineering Branch, February 1987) for discharges of wastewater to surface waters where water contact recreation (REC-1) is a beneficial use. The disinfection guidelines recommend the same treatment requirements for wastewater discharges to REC-1 waters as those stipulated in Title 22 for supply of recycled water to nonrestricted recreational impoundments, since the public health risks under both scenarios are analogous. The disinfection guidelines are based on sound science and are widely used as guidance to assure public health and beneficial use protection.

The Santa Ana River, Reach 1 is not a “nonrestricted recreational impoundment”, nor is “recycled water³” being used as a supply source for the River pursuant to the definitions in Title 22. However, to protect the water contact recreation beneficial use and to prevent nuisance and health risk, it is necessary and appropriate to require the same degree of treatment for wastewater discharges to the River as would be required for the use of recycled water in a nonrestricted recreational impoundment. Thus, this Order specifies requirements based on tertiary or equivalent treatment.

3. Determining the Need for WQBELs

In accordance with Section 1.3 of the SIP, the Regional Water Board conducted a reasonable potential analysis (RPA) for each priority pollutant with an applicable criterion or objective to determine if a WQBEL is required in the Order. The Regional Water Board analyzed effluent data to determine if a pollutant in a discharge has the reasonable potential to cause or contribute to an excursion above a state water quality standard. For all parameters that have the reasonable potential to cause or contribute to an excursion above a water quality standard, numeric WQBELs are required. The RPA considers criteria from the CTR, and when applicable, water quality objectives specified in the Basin Plan.

Sufficient data are needed to conduct a complete RPA. If data are not sufficient, the Discharger will be required to gather the appropriate data for the Regional Water Board to conduct the RPA. Upon review of the data, and if the Regional Water Board determines that WQBELs are needed to protect the beneficial uses, the permit will be reopened for appropriate modification.

The GWR System is under construction currently. The AWTF only started operation in January 2008 and no monitoring data are yet available from this Facility. However, the Discharger has conducted pilot studies of the effluent to determine the possible constituents that may be discharged.

The RPA was performed for the pollutants for which effluent data were available. By reviewing the data provided by the Discharger, ammonia-nitrogen, selenium, free cyanide were determined to have reasonable potential to cause an excursion above applicable pollutant criteria or objectives. Consequently, effluent limitations for these constituents are included in this Order.

³ As defined in the Reclamation Criteria, recycled water means water which, as a result of treatment of domestic wastewater, is suitable for a direct beneficial use or a controlled use that would not otherwise occur.

Table 7. Comparing Effluent Data with WQOs at DP 001

Parameter	unit	Effluent MEC	CTR-Fresh water			NTR	Basin Plan	RPA
		Fresh water	CMC/CCC	WQO	Human Health	CMC	WQO	
NH ₃ -N	mg/L	33.5				14-20		yes
Chlorine, Residual	mg/L	3-5*		0.1			0.1	yes
Cyanide, free	µg/L	74	22					yes
Selenium	µg/L	8	5.0					yes

*. OCWD reported chlorine residual concentration may be as high as 3-5 mg/l during peak flow.

4. WQBEL Calculations

a. Calculation of Freshwater Total Ammonia–Nitrogen Criterion

Considering that the discharges to Reach 1 of Santa Ana River are expected to be of limited duration (12 hours) and to occur only infrequently (no more than once every three years), this Order uses the acute criterion for Total Ammonia–Nitrogen to establish total ammonia effluent limitations.

USEPA-NTR specifies that the one-hour average concentration of total ammonia nitrogen, as N/L, does not exceed, more than once every three years on the average, the acute criterion. The acute criterion for Total Ammonia–Nitrogen is calculated using the following equation:

$$CMC = 0.411 / (1 + 10^{7.204 - pH}) + 58.4 / (1 + 10^{pH - 7.204})$$

Table 8. Calculated Ammonia-Nitrogen Acute Criterion

pH	mg/L
7.5	20
7.7	14

b. Effluent Calculations

Table 9. Selenium Effluent Limits Calculation, µg/L

Constituent	CV = 0.6, long-term average		LTA	Aquatic Life		Permit Limit			
	Caltoxics			Objective/limits	Concentration Limit				
	CMC	CCC	Acute M	Chronic M	MDEL	AMEL	MDEL	AMEL	
Total Recoverable Selenium		5.0	0.0	2.6	2.6	8.2	4.1	8.2	4.1

Table 10. Free Cyanide Effluent Limits Calculation, µg/L

			CV = 0.94, long-term average			Aquatic Life		Permit Limit	
			Acute M	Chronic M	LTA	Objective/limits		Concentration Limit	
Freshwater			0.215	0.39		4.65	1.89		
Constituent	CMC	CCC	Acute LTA	Chronic LTA		MDEL	AMEL	MDEL	AMEL
Free Cyanide	22.0	5.2	4.7	2.0	2.0	9.4	3.8	9.4	3.8

Table 11. Ammonia-Nitrogen Effluent Limits Calculation, mg/L

		CV= 0.18, long-term average			Aquatic Life		Permit Limit	
		Acute M	Chronic M	LTA	Objective/limits		Concentration Limit	
Total Ammonia-Nitrogen		0.673			1.49	1.15		
	NTR	Acute LTA	Chronic LTA		MDEL	AMEL	MDEL	AMEL
pH	CMC							
6.5	48.83	32.9		32.9	49.0	37.8	49	38
6.6	46.84	31.5		31.5	47.0	36.3	47	36
6.7	44.57	30.0		30.0	44.7	34.5	45	34
6.8	42	28.3		28.3	42.1	32.5	42	33
6.9	39.16	26.4		26.4	39.3	30.3	39	30
7.0	36.09	24.29		24.29	36.2	27.9	36	28
7.1	32.54	21.9		21.9	32.6	25.2	33	25
7.2	29.54	19.88		19.88	29.6	22.9	30	23
7.3	26.21	17.6		17.6	26.3	20.3	26	20
7.4	22.97	15.46		15.46	23.0	17.8	23	18
7.5	19.86	13.4		13.4	19.9	15.4	20	15
7.6	17.03	11.46		11.46	17.1	13.2	17	13
7.7	14.44	9.7		9.7	14.5	11.2	14	11
7.8	12.14	8.17		8.17	12.2	9.4	12	9.4
7.9	10.13	6.8		6.8	10.2	7.8	10	7.8
8.0	8.41	5.66		5.66	8.4	6.5	8.4	6.5
8.1	6.95	4.7		4.7	7.0	5.4	7.0	5.4
8.2	5.73	3.86		3.86	5.7	4.4	5.7	4.4
8.3	4.71	3.2		3.2	4.7	3.6	4.7	3.6
8.4	3.88	2.61		2.61	3.9	3.0	3.9	3.0
8.5	3.2	2.2		2.2	3.2	2.5	3.2	2.5

D. Summary of Final Effluent Limitations for DP 001

- 1. Satisfaction of Anti-Backsliding Requirements – Not Applicable**
- 2. Satisfaction of Antidegradation Policy**

Discharges are expected to be limited in duration and frequency and, if conducted in conformance with the requirements of this Order, will not result in a lowering of water quality. The discharges therefore conform to antidegradation requirements specified in Resolution No. 68-16, which incorporates the federal antidegradation policy at 40 CFR 131.12 where, as here, is it applicable.

3. Stringency of Requirements for Individual Pollutants- Not Applicable

4. Summary of Final Effluent Limitations for DP 001:

Table 12. Summary of Water Quality-Based Effluent Limits at DP 001

Parameter	Units	Effluent Limitations					Basis
		Average Monthly* or as noted herein	Average Weekly	Max Daily	Instantaneous Minimum	Instantaneous Maximum	
BOD ₅	mg/L	20	30	--	--	--	Basin Plan
Total Suspended Solids	mg/L	20	30	--	--	--	BP
pH	Std. unit	--	--	--	6.5	8.5	BP
Total Residual Chlorine	mg/L			0.1			BP
Coliform	MPN	--		2.2 MPN	--	--	Title 22
Total Recoverable Selenium, µg/L	µg/L	4.1		8.2			CTR
Free Cyanide, µg/L	µg/L	3.8		9.4			CTR

*: The AMEL applies only if discharges occur for more than one day in a calendar month period

Table 13. Summary of Total Ammonia-Nitrogen Effluent Limits at DP 001

pH	Maximum Daily (mg/L)	Average Monthly* (mg/L)
6.5	49	38
6.6	47	36
6.7	45	34
6.8	42	33
6.9	39	30
7.0	36	28
7.1	33	25
7.2	30	23
7.3	26	20

Table 13. Summary of Total Ammonia-Nitrogen Effluent Limits at DP 001		
pH	Maximum Daily (mg/L)	Average Monthly* (mg/L)
7.4	23	18
7.5	20	15
7.6	17	13
7.7	14	11
7.8	12	9.4
7.9	10	7.8
8.0	8.4	6.5
8.1	7.0	5.4
8.2	5.7	4.4
8.3	4.7	3.6
8.4	3.9	3.0
8.5	3.2	2.5

*: The average monthly effluent limitation (AMEL) applies only if there is more than one-day discharge in a calendar month period.

E. Interim Effluent Limitations for DP 001 - Not Applicable

F. Land Discharge Specifications – Not Applicable

G. Reclamation Specifications – Not Applicable

Recycled water recharge into groundwater is regulated under Order R8-2004-002.

H. Stormwater Discharge Requirements – Not Applicable

Currently, stormwater discharges from the Facility are regulated under the State’s general construction activity permit. When on-site construction is fully completed, stormwater runoff from the Facility will be regulated under the State’s general industrial stormwater activity permit.

V. RATIONALE FOR RECEIVING WATER LIMITATIONS

A. Surface Water

The surface water receiving water limitations in this Order are based upon the water quality objectives contained in the Basin Plan. As such, they are required part of the proposed Order.

B. Groundwater – Not Applicable

VI. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

Section 122.48 of 40 CFR requires all NPDES permits to specify recording and reporting of monitoring results. Sections 13267 and 13383 of the CWC authorize the Regional Water Boards to require technical and monitoring reports. The MRP, Attachment E of this Order, establishes monitoring and reporting requirements to implement federal and State requirements. The following provides the rationale for the monitoring and reporting requirements contained in the MRP for this Facility.

A. Influent Monitoring

Influent monitoring is required to determine the effectiveness of the treatment program and assess treatment plant performance.

B. Effluent Monitoring

The Discharger is required to conduct monitoring of the permitted discharges in order to evaluate compliance with permit conditions. Monitoring requirements are given in the proposed monitoring and reporting program (Attachment E). This provision requires compliance with the monitoring and reporting program, and is based on 40 CFR 122.44(i), 122.62, 122.63 and 124.5. The SMP is a standard requirement in almost all NPDES permits (including the proposed Order) issued by the Regional Water Board. In addition to containing definitions of terms, it specifies general sampling/analytical protocols and the requirements of reporting of spills, violations, and routine monitoring data in accordance with NPDES regulations, the California Water Code, and Regional Water Board's policies. The monitoring and reporting program also contains sampling program specific for the Discharger's wastewater treatment plant. It defines the sampling stations and frequency, pollutants to be monitored, and additional reporting requirements. Pollutants to be monitored include all pollutants for which effluent limitations are specified. Further, in accordance with Section 1.3 of the SIP, periodic monitoring is required for all priority pollutants defined by the CTR, for which criteria apply and for which no effluent limitations have been established, to evaluate reasonable potential to cause or contribute to an excursion above a water quality standard.

C. Receiving Water Monitoring

1. Surface Water

Receiving water monitoring is required to determine compliance with receiving water limitations and to characterize the water quality of the receiving water. Requirements are based on the Basin Plan.

2. Groundwater - Not Applicable

D. Other Monitoring Requirements

1. Water Supply Monitoring – Not Applicable

2. Biosolids Monitoring

Biosolids produced at the AWTF are channeled back to OCSD for treatment and disposal.

3. Pretreatment Monitoring – Not Applicable

VII. RATIONALE FOR PROVISIONS

A. Standard Provisions

Standard Provisions, which apply to all NPDES permits in accordance with section 122.41, and additional conditions applicable to specified categories of permits in accordance with section 122.42, are provided in Attachment D. The Discharger must comply with all standard provisions and with those additional conditions that are applicable under section 122.42.

Section 122.41(a)(1) and (b) through (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. Section 123.25(a)(12) allows the state to omit or modify conditions to impose more stringent requirements. In accordance with section 123.25, this Order omits federal conditions that address enforcement authority specified in sections 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 provisions are based on 40 CFR Parts 122.44(c) and 123. The Regional Water Board may reopen the permit to modify permit conditions and requirements. Causes for modifications include the promulgation of new regulations, modification in sludge use or disposal practices, or adoption of new regulations by the State Water Board or Regional Water Board, including revisions to the Basin Plan.

2. Special Studies and Additional Monitoring Requirements – Not Applicable

3. Best Management Practices and Pollution Prevention – Not Applicable

4. Construction, Operation, and Maintenance Specifications – Not Applicable

Construction, Operation, and Maintenance Specifications are already included in Order No. R8-2004-0002 which regulates use of recycled water from the GWRS for recharge.

5. Special Provisions for Municipal Facilities - POTWs Only – Not Applicable

6. Other Special Provisions – Not Applicable

7. Compliance Schedules – Not Applicable

VIII. PUBLIC PARTICIPATION

The California Regional Water Quality Control Board, Santa Ana Region (Regional 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 Orange County Water District's groundwater replenishment system, advanced water treatment facility, emergency discharge to Reach 1 of Santa Ana River. As a step in the WDR adoption process, the Regional Water Board staff has developed tentative WDRs. The Regional Water Board encourages public participation in the WDR adoption process.

A. Notification of Interested Parties

The Regional 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 posting of Notice of Public Hearing at the local City Hall and at the local newspaper; and at the Regional Water Board website: <http://www.waterboards.ca.gov/santaana> on June 18, 2008.

B. Written Comments

The staff determinations are tentative. Interested persons are invited to submit written comments concerning these tentative WDRs. Comments must be submitted either in person or by mail to the Executive Office at the Regional Water Board at the address above on the cover page of this Order.

To be fully responded to by staff and considered by the Regional Water Board, written comments must be received at the Regional Water Board offices by 5:00 p.m. on June 27, 2008.

Jane Qiu
California Regional Water Quality Control Board
Santa Ana Region
3737 Main Street, Suite 500
Riverside, CA 92501-3348

C. Public Hearing

The Regional 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: July 18, 2008
Time: 9:30 A.M.
Location: City Council Chambers of Loma Linda
25541 Barton Road
City of Loma Linda, CA

Interested persons are invited to attend. At the public hearing, the Regional Water Board will hear testimony, if any, pertinent to the discharge, WDRs, and permit. Oral testimony will be heard; however, for accuracy of the record, important testimony should be in writing.

Please be aware that dates and venues may change. Our Web address is <http://www.waterboards.ca.gov/santaana> 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 Regional Water Board regarding the final WDRs. The petition must be submitted within 30 days of the Regional 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 8:30 a.m. and 4:45 p.m., Monday through Friday. Copying of documents may be arranged through the Regional Water Board by calling (951) 320-2008.

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 Regional 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 Jane Qiu at (951) 320-2008.

ATTACHMENT G - EPA PRIORITY POLLUTANT LIST

EPA PRIORITY POLLUTANT LIST		
Metals	Acid Extractibles	Base/Neutral Extractibles (continuation)
1. Antimony	45. 2-Chlorophenol	91. Hexachloroethane
2. Arsenic	46. 2,4-Dichlorophenol	92. Indeno (1,2,3-cd) Pyrene
3. Beryllium	47. 2,4-Dimethylphenol	93. Isophorone
4. Cadmium	48. 2-Methyl-4,6-Dinitrophenol	94. Naphthalene
5a. Chromium (III)	49. 2,4-Dinitrophenol	95. Nitrobenzene
5b. Chromium (VI)	50. 2-Nitrophenol	96. N-Nitrosodimethylamine
6. Copper	51. 4-Nitrophenol	97. N-Nitrosodi-N-Propylamine
7. Lead	52. 3-Methyl-4-Chlorophenol	98. N-Nitrosodiphenylamine
8. Mercury	53. Pentachlorophenol	99. Phenanthrene
9. Nickel	54. Phenol	100. Pyrene
10. Selenium	55. 2, 4, 6 – Trichlorophenol	101. 1,2,4-Trichlorobenzene
11. Silver	Base/Neutral Extractibles	Pesticides
12. Thallium	56. Acenaphthene	102. Aldrin
13. Zinc	57. Acenaphthylene	103. Alpha BHC
	Miscellaneous	104. Beta BHC
14. Cyanide	58. Anthracene	105. Delta BHC
15. Asbestos (not required unless requested)	59. Benzidine	106. Gamma BHC
16. 2,3,7,8-Tetrachlorodibenzo-P-Dioxin (TCDD)	60. Benzo (a) Anthracene	107. Chlordane
	Volatile Organics	108. 4, 4' - DDT
17. Acrolein	61. Benzo (a) Pyrene	109. 4, 4' - DDE
18. Acrylonitrile	62. Benzo (b) Fluoranthene	110. 4, 4' - DDD
19. Benzene	63. Benzo (g,h,i) Perylene	111. Dieldrin
20. Bromoform	64. Benzo (k) Fluoranthene	112. Alpha Endosulfan
21. Carbon Tetrachloride	65. Bis (2-Chloroethoxy) Methane	113. Beta Endosulfan
22. Chlorobenzene	66. Bis (2-Chloroethyl) Ether	114. Endosulfan Sulfate
23. Chlorodibromomethane	67. Bis (2-Chloroisopropyl) Ether	115. Endrin
24. Chloroethane	68. Bis (2-Ethylhexyl) Phthalate	116. Endrin Aldehyde
25. 2-Chloroethyl Vinyl Ether	69. 4-Bromophenyl Phenyl Ether	117. Heptachlor
26. Chloroform	70. Butylbenzyl Phthalate	118. Heptachlor Epoxide
27. Dichlorobromomethane	71. 2-Chloronaphthalene	119. PCB 1016
28. 1,1-Dichloroethane	72. 4-Chlorophenyl Phenyl Ether	120. PCB 1221
29. 1,2-Dichloroethane	73. Chrysene	121. PCB 1232
30. 1,1-Dichloroethylene	74. Dibenzo (a,h) Anthracene	122. PCB 1242
31. 1,2-Dichloropropane	75. 1,2-Dichlorobenzene	123. PCB 1248
32. 1,3-Dichloropropylene	76. 1,3-Dichlorobenzene	124. PCB 1254
33. Ethylbenzene	77. 1,4-Dichlorobenzene	125. PCB 1260
34. Methyl Bromide	78. 3,3'-Dichlorobenzidine	126. Toxaphene
35. Methyl Chloride	79. Diethyl Phthalate	
36. Methylene Chloride	80. Dimethyl Phthalate	
37. 1,1,2,2-Tetrachloroethane	81. Di-n-Butyl Phthalate	
38. Tetrachloroethylene	82. 2,4-Dinitrotoluene	
39. Toluene	83. 2,6-Dinitrotoluene	
40. 1,2-Trans-Dichloroethylene	84. Di-n-Octyl Phthalate	
41. 1,1,1-Trichloroethane	85. 1,2-Dipenylhydrazine	
42. 1,1,2-Trichloroethane	86. Fluoranthene	
43. Trichloroethylene	87. Fluorene	
44. Vinyl Chloride	88. Hexachlorobenzene	
	89. Hexachlorobutadiene	
	90. Hexachlorocyclopentadiene	

ATTACHMENT H – MINIMUM LEVELS

MINIMUM LEVELS IN PPB (µg/l)

Table 1- VOLATILE SUBSTANCES ¹	GC	GCMS
Acrolein	2.0	5
Acrylonitrile	2.0	2
Benzene	0.5	2
Bromoform	0.5	2
Carbon Tetrachloride	0.5	2
Chlorobenzene	0.5	2
Chlorodibromomethane	0.5	2
Chloroethane	0.5	2
Chloroform	0.5	2
Dichlorobromomethane	0.5	2
1,1 Dichloroethane	0.5	1
1,2 Dichloroethane	0.5	2
1,1 Dichloroethylene	0.5	2
1,2 Dichloropropane	0.5	1
1,3 Dichloropropylene (volatile)	0.5	2
Ethylbenzene	0.5	2
Methyl Bromide (<i>Bromomethane</i>)	1.0	2
Methyl Chloride (<i>Chloromethane</i>)	0.5	2
Methylene Chloride (<i>Dichloromethane</i>)	0.5	2
1,1,2,2 Tetrachloroethane	0.5	1
Tetrachloroethylene	0.5	2
Toluene	0.5	2
trans-1,2 Dichloroethylene	0.5	1
1,1,1 Trichloroethane	0.5	2
1,1,2 Trichloroethane	0.5	2
Trichloroethylene	0.5	2
Vinyl Chloride	0.5	2
1,2 Dichlorobenzene (volatile)	0.5	2
1,3 Dichlorobenzene (volatile)	0.5	2
1,4 Dichlorobenzene (volatile)	0.5	2

Selection and Use of Appropriate ML Value:

ML Selection: When there is more than one ML value for a given substance, the discharger may select any one of those ML values, and their associated analytical methods, listed in this Attachment that are below the calculated effluent limitation for compliance determination. If no ML value is below the effluent limitation, then the discharger shall select the lowest ML value, and its associated analytical method, listed in the PQL Table.

ML Usage: The ML value in this Attachment represents the lowest quantifiable concentration in a sample based on the proper application of all method-based analytical procedures and the absence of any matrix interferences. Assuming that all method-specific analytical steps are followed, the ML value will also represent, after the appropriate application of method-specific factors, the lowest standard in the calibration curve for that specific analytical technique. Common analytical practices sometimes require different treatment of the sample relative to calibration standards.

Note: chemical names in parenthesis and italicized is another name for the constituent.

¹ *The normal method-specific factor for these substances is 1, therefore, the lowest standard concentration in the calibration curve is equal to the above ML value for each substance.*

MINIMUM LEVELS IN PPB (µg/l)

Table 2 – Semi-Volatile Substances²	GC	GCMS	LC
2-Chloroethyl vinyl ether	1	1	
2 Chlorophenol	2	5	
2,4 Dichlorophenol	1	5	
2,4 Dimethylphenol	1	2	
4,6 Dinitro-2-methylphenol	10	5	
2,4 Dinitrophenol	5	5	
2- Nitrophenol		10	
4- Nitrophenol	5	10	
4 Chloro-3-methylphenol	5	1	
2,4,6 Trichlorophenol	10	10	
Acenaphthene	1	1	0.5
Acenaphthylene		10	0.2
Anthracene		10	2
Benzidine		5	
Benzo (a) Anthracene (1,2 Benzanthracene)	10	5	
Benzo(a) pyrene (3,4 Benzopyrene)		10	2
Benzo (b) Fluoranthene (3,4 Benzofluoranthene)		10	10
Benzo(g,h,i)perylene		5	0.1
Benzo(k)fluoranthene		10	2
bis 2-(1-Chloroethoxyl) methane		5	
bis(2-chloroethyl) ether	10	1	
bis(2-Chloroisopropyl) ether	10	2	
bis(2-Ethylhexyl) phthalate	10	5	
4-Bromophenyl phenyl ether	10	5	
Butyl benzyl phthalate	10	10	
2-Chloronaphthalene		10	
4-Chlorophenyl phenyl ether		5	
Chrysene		10	5
Dibenzo(a,h)-anthracene		10	0.1
1,2 Dichlorobenzene (semivolatile)	2	2	
1,3 Dichlorobenzene (semivolatile)	2	1	
1,4 Dichlorobenzene (semivolatile)	2	1	
3,3' Dichlorobenzidine		5	
Diethyl phthalate	10	2	
Dimethyl phthalate	10	2	
di-n-Butyl phthalate		10	
2,4 Dinitrotoluene	10	5	
2,6 Dinitrotoluene		5	
di-n-Octyl phthalate		10	
1,2 Diphenylhydrazine		1	
Fluoranthene	10	1	0.05
Fluorene		10	0.1
Hexachloro-cyclopentadiene	5	5	
1,2,4 Trichlorobenzene	1	5	

MINIMUM LEVELS IN PPB (µg/l)

Table 2 - SEMI-VOLATILE SUBSTANCES²	GC	GCMS	LC	COLOR
Pentachlorophenol	1	5		
Phenol ³	1	1		50
Hexachlorobenzene	5	1		
Hexachlorobutadiene	5	1		
Hexachloroethane	5	1		
Indeno(1,2,3,cd)-pyrene		10	0.05	
Isophorone	10	1		
Naphthalene	10	1	0.2	
Nitrobenzene	10	1		
N-Nitroso-dimethyl amine	10	5		
N-Nitroso -di n-propyl amine	10	5		
N-Nitroso diphenyl amine	10	1		
Phenanthrene		5	0.05	
Pyrene		10	0.05	

Table 3– INORGANICS⁴	FAA	GFAA	ICP	ICPMS	SPGFAA	HYDRIDE	CVAA	COLOR	DCP
Antimony	10	5	50	0.5	5	0.5			1000
Arsenic		2	10	2	2	1		20	1000
Beryllium	20	0.5	2	0.5	1				1000
Cadmium	10	0.5	10	0.25	0.5				1000
Chromium (total)	50	2	10	0.5	1				1000
Chromium VI	5							10	
Copper	25	5	10	0.5	2				1000
Lead	20	5	5	0.5	2				10000
Mercury				0.5			0.2		
Nickel	50	5	20	1	5				1000
Selenium		5	10	2	5	1			1000
Silver	10	1	10	0.25	2				1000
Thallium	10	2	10	1	5				1000
Zinc	20		20	1	10				1000
Cyanide								5	

² With the exception of phenol by colorimetric technique, the normal method-specific factor for these substances is 1000, therefore, the lowest standards concentration in the calibration curve is equal to the above ML value for each substance multiplied by 1000.

³ Phenol by colorimetric technique has a factor of 1.

⁴ The normal method-specific factor for these substances is 1, therefore, the lowest standard concentration in the calibration curve is equal to the above ML value for each substance.

MINIMUM LEVELS IN PPB (µg/l)

Table 4- PESTICIDES – PCBs⁵	GC
Aldrin	0.005
alpha-BHC (<i>a-Hexachloro-cyclohexane</i>)	0.01
beta-BHC (<i>b-Hexachloro-cyclohexane</i>)	0.005
Gamma-BHC (<i>Lindane; g-Hexachloro-cyclohexane</i>)	0.02
Delta-BHC (<i>d-Hexachloro-cyclohexane</i>)	0.005
Chlordane	0.1
4,4'-DDT	0.01
4,4'-DDE	0.05
4,4'-DDD	0.05
Dieldrin	0.01
Alpha-Endosulfan	0.02
Beta-Endosulfan	0.01
Endosulfan Sulfate	0.05
Endrin	0.01
Endrin Aldehyde	0.01
Heptachlor	0.01
Heptachlor Epoxide	0.01
PCB 1016	0.5
PCB 1221	0.5
PCB 1232	0.5
PCB 1242	0.5
PCB 1248	0.5
PCB 1254	0.5
PCB 1260	0.5
Toxaphene	0.5

Techniques:

- GC - Gas Chromatography
- GCMS - Gas Chromatography/Mass Spectrometry
- HRGCMS - High Resolution Gas Chromatography/Mass Spectrometry (i.e., EPA 1613, 1624, or 1625)
- LC - High Pressure Liquid Chromatography
- FAA - Flame Atomic Absorption
- GFAA - Graphite Furnace Atomic Absorption
- HYDRIDE - Gaseous Hydride Atomic Absorption
- CVAA - Cold Vapor Atomic Absorption
- ICP - Inductively Coupled Plasma
- ICPMS - Inductively Coupled Plasma/Mass Spectrometry
- SPGFAA - Stabilized Platform Graphite Furnace Atomic Absorption (i.e., EPA 200.9)
- DCP - Direct Current Plasma
- COLOR - Colorimetric

⁵ *The normal method-specific factor for these substances is 100, therefore, the lowest standard concentration in the calibration curve is equal to the above ML value for each substance multiplied by 100.*

ATTACHMENT G - EPA PRIORITY POLLUTANT LIST

EPA PRIORITY POLLUTANT LIST		
Metals	Acid Extractibles	Base/Neutral Extractibles (continuation)
1. Antimony	45. 2-Chlorophenol	91. Hexachloroethane
2. Arsenic	46. 2,4-Dichlorophenol	92. Indeno (1,2,3-cd) Pyrene
3. Beryllium	47. 2,4-Dimethylphenol	93. Isophorone
4. Cadmium	48. 2-Methyl-4,6-Dinitrophenol	94. Naphthalene
5a. Chromium (III)	49. 2,4-Dinitrophenol	95. Nitrobenzene
5b. Chromium (VI)	50. 2-Nitrophenol	96. N-Nitrosodimethylamine
6. Copper	51. 4-Nitrophenol	97. N-Nitrosodi-N-Propylamine
7. Lead	52. 3-Methyl-4-Chlorophenol	98. N-Nitrosodiphenylamine
8. Mercury	53. Pentachlorophenol	99. Phenanthrene
9. Nickel	54. Phenol	100. Pyrene
10. Selenium	55. 2, 4, 6 – Trichlorophenol	101. 1,2,4-Trichlorobenzene
11. Silver	Base/Neutral Extractibles	Pesticides
12. Thallium	56. Acenaphthene	102. Aldrin
13. Zinc	57. Acenaphthylene	103. Alpha BHC
Miscellaneous	58. Anthracene	104. Beta BHC
14. Cyanide	59. Benzidine	105. Delta BHC
15. Asbestos (not required unless requested)	60. Benzo (a) Anthracene	106. Gamma BHC
16. 2,3,7,8-Tetrachlorodibenzo-P-Dioxin (TCDD)	61. Benzo (a) Pyrene	107. Chlordane
Volatile Organics	62. Benzo (b) Fluoranthene	108. 4, 4' - DDT
17. Acrolein	63. Benzo (g,h,i) Perylene	109. 4, 4' - DDE
18. Acrylonitrile	64. Benzo (k) Fluoranthene	110. 4, 4' - DDD
19. Benzene	65. Bis (2-Chloroethoxy) Methane	111. Dieldrin
20. Bromoform	66. Bis (2-Chloroethyl) Ether	112. Alpha Endosulfan
21. Carbon Tetrachloride	67. Bis (2-Chloroisopropyl) Ether	113. Beta Endosulfan
22. Chlorobenzene	68. Bis (2-Ethylhexyl) Phthalate	114. Endosulfan Sulfate
23. Chlorodibromomethane	69. 4-Bromophenyl Phenyl Ether	115. Endrin
24. Chloroethane	70. Butylbenzyl Phthalate	116. Endrin Aldehyde
25. 2-Chloroethyl Vinyl Ether	71. 2-Chloronaphthalene	117. Heptachlor
26. Chloroform	72. 4-Chlorophenyl Phenyl Ether	118. Heptachlor Epoxide
27. Dichlorobromomethane	73. Chrysene	119. PCB 1016
28. 1,1-Dichloroethane	74. Dibenzo (a,h) Anthracene	120. PCB 1221
29. 1,2-Dichloroethane	75. 1,2-Dichlorobenzene	121. PCB 1232
30. 1,1-Dichloroethylene	76. 1,3-Dichlorobenzene	122. PCB 1242
31. 1,2-Dichloropropane	77. 1,4-Dichlorobenzene	123. PCB 1248
32. 1,3-Dichloropropylene	78. 3,3'-Dichlorobenzidine	124. PCB 1254
33. Ethylbenzene	79. Diethyl Phthalate	125. PCB 1260
34. Methyl Bromide	80. Dimethyl Phthalate	126. Toxaphene
35. Methyl Chloride	81. Di-n-Butyl Phthalate	
36. Methylene Chloride	82. 2,4-Dinitrotoluene	
37. 1,1,2,2-Tetrachloroethane	83. 2,6-Dinitrotoluene	
38. Tetrachloroethylene	84. Di-n-Octyl Phthalate	
39. Toluene	85. 1,2-Dipenylhydrazine	
40. 1,2-Trans-Dichloroethylene	86. Fluoranthene	
41. 1,1,1-Trichloroethane	87. Fluorene	
42. 1,1,2-Trichloroethane	88. Hexachlorobenzene	
43. Trichloroethylene	89. Hexachlorobutadiene	
44. Vinyl Chloride	90. Hexachlorocyclopentadiene	

ATTACHMENT H – MINIMUM LEVELS

MINIMUM LEVELS IN PPB (µg/l)

Table 1- VOLATILE SUBSTANCES¹	GC	GCMS
Acrolein	2.0	5
Acrylonitrile	2.0	2
Benzene	0.5	2
Bromoform	0.5	2
Carbon Tetrachloride	0.5	2
Chlorobenzene	0.5	2
Chlorodibromomethane	0.5	2
Chloroethane	0.5	2
Chloroform	0.5	2
Dichlorobromomethane	0.5	2
1,1 Dichloroethane	0.5	1
1,2 Dichloroethane	0.5	2
1,1 Dichloroethylene	0.5	2
1,2 Dichloropropane	0.5	1
1,3 Dichloropropylene (volatile)	0.5	2
Ethylbenzene	0.5	2
Methyl Bromide (<i>Bromomethane</i>)	1.0	2
Methyl Chloride (<i>Chloromethane</i>)	0.5	2
Methylene Chloride (<i>Dichloromethane</i>)	0.5	2
1,1,2,2 Tetrachloroethane	0.5	1
Tetrachloroethylene	0.5	2
Toluene	0.5	2
trans-1,2 Dichloroethylene	0.5	1
1,1,1 Trichloroethane	0.5	2
1,1,2 Trichloroethane	0.5	2
Trichloroethylene	0.5	2
Vinyl Chloride	0.5	2
1,2 Dichlorobenzene (volatile)	0.5	2
1,3 Dichlorobenzene (volatile)	0.5	2
1,4 Dichlorobenzene (volatile)	0.5	2

Selection and Use of Appropriate ML Value:

ML Selection: When there is more than one ML value for a given substance, the discharger may select any one of those ML values, and their associated analytical methods, listed in this Attachment that are below the calculated effluent limitation for compliance determination. If no ML value is below the effluent limitation, then the discharger shall select the lowest ML value, and its associated analytical method, listed in the PQL Table.

ML Usage: The ML value in this Attachment represents the lowest quantifiable concentration in a sample based on the proper application of all method-based analytical procedures and the absence of any matrix interferences. Assuming that all method-specific analytical steps are followed, the ML value will also represent, after the appropriate application of method-specific factors, the lowest standard in the calibration curve for that specific analytical technique. Common analytical practices sometimes require different treatment of the sample relative to calibration standards.

Note: chemical names in parenthesis and italicized is another name for the constituent.

¹ *The normal method-specific factor for these substances is 1, therefore, the lowest standard concentration in the calibration curve is equal to the above ML value for each substance.*

MINIMUM LEVELS IN PPB (µg/l)

Table 2 – Semi-Volatile Substances²	GC	GCMS	LC
2-Chloroethyl vinyl ether	1	1	
2 Chlorophenol	2	5	
2,4 Dichlorophenol	1	5	
2,4 Dimethylphenol	1	2	
4,6 Dinitro-2-methylphenol	10	5	
2,4 Dinitrophenol	5	5	
2- Nitrophenol		10	
4- Nitrophenol	5	10	
4 Chloro-3-methylphenol	5	1	
2,4,6 Trichlorophenol	10	10	
Acenaphthene	1	1	0.5
Acenaphthylene		10	0.2
Anthracene		10	2
Benzidine		5	
Benzo (a) Anthracene (1,2 Benzanthracene)	10	5	
Benzo(a) pyrene (3,4 Benzopyrene)		10	2
Benzo (b) Fluoranthene (3,4 Benzofluoranthene)		10	10
Benzo(g,h,i)perylene		5	0.1
Benzo(k)fluoranthene		10	2
bis 2-(1-Chloroethoxyl) methane		5	
bis(2-chloroethyl) ether	10	1	
bis(2-Chloroisopropyl) ether	10	2	
bis(2-Ethylhexyl) phthalate	10	5	
4-Bromophenyl phenyl ether	10	5	
Butyl benzyl phthalate	10	10	
2-Chloronaphthalene		10	
4-Chlorophenyl phenyl ether		5	
Chrysene		10	5
Dibenzo(a,h)-anthracene		10	0.1
1,2 Dichlorobenzene (semivolatile)	2	2	
1,3 Dichlorobenzene (semivolatile)	2	1	
1,4 Dichlorobenzene (semivolatile)	2	1	
3,3' Dichlorobenzidine		5	
Diethyl phthalate	10	2	
Dimethyl phthalate	10	2	
di-n-Butyl phthalate		10	
2,4 Dinitrotoluene	10	5	
2,6 Dinitrotoluene		5	
di-n-Octyl phthalate		10	
1,2 Diphenylhydrazine		1	
Fluoranthene	10	1	0.05
Fluorene		10	0.1
Hexachloro-cyclopentadiene	5	5	
1,2,4 Trichlorobenzene	1	5	

MINIMUM LEVELS IN PPB (µg/l)

Table 2 - SEMI-VOLATILE SUBSTANCES²	GC	GCMS	LC	COLOR
Pentachlorophenol	1	5		
Phenol ³	1	1		50
Hexachlorobenzene	5	1		
Hexachlorobutadiene	5	1		
Hexachloroethane	5	1		
Indeno(1,2,3,cd)-pyrene		10	0.05	
Isophorone	10	1		
Naphthalene	10	1	0.2	
Nitrobenzene	10	1		
N-Nitroso-dimethyl amine	10	5		
N-Nitroso -di n-propyl amine	10	5		
N-Nitroso diphenyl amine	10	1		
Phenanthrene		5	0.05	
Pyrene		10	0.05	

Table 3– INORGANICS⁴	FAA	GFAA	ICP	ICPMS	SPGFAA	HYDRIDE	CVAA	COLOR	DCP
Antimony	10	5	50	0.5	5	0.5			1000
Arsenic		2	10	2	2	1		20	1000
Beryllium	20	0.5	2	0.5	1				1000
Cadmium	10	0.5	10	0.25	0.5				1000
Chromium (total)	50	2	10	0.5	1				1000
Chromium VI	5							10	
Copper	25	5	10	0.5	2				1000
Lead	20	5	5	0.5	2				10000
Mercury				0.5			0.2		
Nickel	50	5	20	1	5				1000
Selenium		5	10	2	5	1			1000
Silver	10	1	10	0.25	2				1000
Thallium	10	2	10	1	5				1000
Zinc	20		20	1	10				1000
Cyanide								5	

² With the exception of phenol by colorimetric technique, the normal method-specific factor for these substances is 1000, therefore, the lowest standards concentration in the calibration curve is equal to the above ML value for each substance multiplied by 1000.

³ Phenol by colorimetric technique has a factor of 1.

⁴ The normal method-specific factor for these substances is 1, therefore, the lowest standard concentration in the calibration curve is equal to the above ML value for each substance.

MINIMUM LEVELS IN PPB (µg/l)

Table 4- PESTICIDES – PCBs⁵	GC
Aldrin	0.005
alpha-BHC (<i>a</i> -Hexachloro-cyclohexane)	0.01
beta-BHC (<i>b</i> -Hexachloro-cyclohexane)	0.005
Gamma-BHC (<i>Lindane</i> ; <i>g</i> -Hexachloro-cyclohexane)	0.02
Delta-BHC (<i>d</i> -Hexachloro-cyclohexane)	0.005
Chlordane	0.1
4,4'-DDT	0.01
4,4'-DDE	0.05
4,4'-DDD	0.05
Dieldrin	0.01
Alpha-Endosulfan	0.02
Beta-Endosulfan	0.01
Endosulfan Sulfate	0.05
Endrin	0.01
Endrin Aldehyde	0.01
Heptachlor	0.01
Heptachlor Epoxide	0.01
PCB 1016	0.5
PCB 1221	0.5
PCB 1232	0.5
PCB 1242	0.5
PCB 1248	0.5
PCB 1254	0.5
PCB 1260	0.5
Toxaphene	0.5

Techniques:

- GC - Gas Chromatography
- GCMS - Gas Chromatography/Mass Spectrometry
- HRGCMS - High Resolution Gas Chromatography/Mass Spectrometry (i.e., EPA 1613, 1624, or 1625)
- LC - High Pressure Liquid Chromatography
- FAA - Flame Atomic Absorption
- GFAA - Graphite Furnace Atomic Absorption
- HYDRIDE - Gaseous Hydride Atomic Absorption
- CVAA - Cold Vapor Atomic Absorption
- ICP - Inductively Coupled Plasma
- ICPMS - Inductively Coupled Plasma/Mass Spectrometry
- SPGFAA - Stabilized Platform Graphite Furnace Atomic Absorption (i.e., EPA 200.9)
- DCP - Direct Current Plasma
- COLOR - Colorimetric

⁵ *The normal method-specific factor for these substances is 100, therefore, the lowest standard concentration in the calibration curve is equal to the above ML value for each substance multiplied by 100.*

APPENDIX: D

**STATE WATER RESOURCES CONTROL BOARD
WATER QUALITY ORDER NO. 2009-0006-DWQ**

**GENERAL WASTE DISCHARGE REQUIREMENTS FOR
LANDSCAPE IRRIGATION USES OF MUNICIPAL RECYCLED WATER
(GENERAL PERMIT)**

The State Water Resources Control Board (State Water Board) finds that:

1. The California Legislature has declared its intent to promote the use of recycled water. Recycled water^{1,2} is a valuable resource and significant component of California's water supply. When used in compliance with the Recycled Water Policy,³ California Code of Regulations (CCR) Title 22, and all applicable state and federal water quality laws, the State Water Board finds that recycled water is safe for approved uses, and strongly supports recycled water as a safe alternative to potable water for such approved uses.
2. This General Permit is intended to satisfy the requirements of California Water Code (Water Code) section 13552.5 and is for Producers and Distributors⁴ of recycled water for landscape irrigation uses. This General Permit is intended to streamline the regulatory process for such uses of recycled water but may not be appropriate for all scenarios due to unique site-specific characteristics and conditions. For this General Permit, "recycled water" is limited to disinfected tertiary recycled water produced by a public entity at a municipal wastewater treatment plant (WWTP), as defined in Water Code section 13625(b)(1) and section 13625(b)(2). This General Permit is not applicable for the use of water produced from the treatment of other non-municipal wastewaters (e.g., oil field production, food processing, storm water, etc.) at other types of treatment facilities (e.g., industrial wastewater treatment plants). Pursuant to Water Code section 13552.5(e)(1), persons who are covered under this General Permit are not required to remain subject to the applicable provisions of existing waste discharge requirements or water reclamation requirements.
3. Landscape irrigation with recycled water is a viable strategy to reduce potable water demand and to reduce the volume of water wasted after a single use. Specified uses of recycled water considered "landscape irrigation" projects include any of the following:
 - i. Parks, greenbelts, and playgrounds;
 - ii. School yards;
 - iii. Athletic fields;
 - iv. Golf courses;
 - v. Cemeteries;

¹ *Recycled Water*: Water which, as a result of treatment of municipal wastewater, is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is therefore considered a valuable resource (Water Code section 13050).

² The terms "recycled water" and "reclaimed water" have the same meaning (Water Code section 26).

³ The Recycled Water Policy was adopted on February 3, 2009 under State Water Board Resolution No. 2009-0011.

⁴ Throughout this General Permit, refer to Attachment A for definitions.

- vi. Residential landscaping, common areas;⁵
 - vii. Commercial landscaping, except eating areas;
 - viii. Industrial landscaping, except eating areas; and
 - ix. Freeway, highway, and street landscaping.
4. Recycled water projects eligible for coverage under this General Permit shall meet the following treatment and use standards:
- a. The Producer shall, being a public entity, produce disinfected tertiary recycled water, as defined in CCR Title 22, sections 60301.230 and 60301.320, at a municipal wastewater treatment plant; and
 - b. The Distributors shall comply with the applicable uniform statewide reclamation criteria established pursuant to CWC section 13521 (i.e., CCR Title 22 section 60301 et. seq., hereafter “Title 22 Requirements”).
 - c. The Producer and Distributor shall ensure that Users comply with the applicable uniform statewide reclamation criteria established pursuant to Title 22 Requirements.
 - d. The Producers and Distributor shall satisfy all applicable requirements of the Recycled Water Policy.
5. The use of recycled water for landscape irrigation has characteristics which can create water quality and public health problems if improperly treated and managed. It is necessary to establish requirements for landscape irrigation uses of recycled water that ensure protection of water resources and public health. (e.g., pathogenic organisms, salinity and other waste constituents, and potential for unauthorized discharges).
6. This General Permit establishes requirements to manage recycled water for landscape irrigation uses in a manner that is protective of public health and the environment. The State Water Board will exercise its authority to the fullest extent possible to encourage the use of recycled water, consistent with state and federal water quality laws. The beneficial use of recycled water for landscape irrigation under this General Permit is environmentally sound and preferable to non-beneficial disposal and waste of water. This General Permit builds on extensive work that has already been done by the Water Boards, the California Department of Public Health (CDPH), the 2003 Recycled Water Task Force and many others.
7. This General Permit is applicable to Use Areas where recycled water is used or conveyed for landscape irrigation and is not intended to regulate the treatment of municipal wastewater. Compliance with this General Permit does not relieve Producers or Distributors from the obligation to comply with applicable waste discharge requirements for discharges from wastewater treatment plants other than landscape irrigation uses of recycled water authorized pursuant to this General Permit.

⁵ Individually owned residences are not eligible for coverage under this General Permit. The Regional Water Boards will address individually owned residences on a case-by-case basis.

8. To obtain coverage under this General Permit, either a Producer or a Distributor shall submit a complete Notice of Intent (NOI) form (Attachment B), Operations & Maintenance Plan, and appropriate application fee to the State Water Board. Either a Producer or a Distributor shall declare responsibility for the administration of the recycled water program authorized pursuant to this General Permit (hereafter Administrator). A duly authorized representative for each entity involved in the production and distribution of recycled water shall each sign the NOI form as appropriate. The Producer and Distributor may be the same entity. Administrators who submit a complete application package, meet the eligibility criteria of this General Permit, and following the conclusion of a thirty (30) day public review period, will typically be authorized to distribute recycled water for landscape irrigation uses.
9. The application fee shall be equal to the annual fee, pursuant to Water Code section 13260. Fee amounts are specified in Section 2200, Chapter 9, Division 3, Title 23, CCR. The Administrator shall be billed for an annual fee equal to the application fee until coverage under the General Permit has been terminated.
10. The Regional Water Quality Control Boards (Regional Water Boards) have evaluated groundwater and surface waters within their jurisdictions for their maximum potential beneficial uses.⁶ Some of those use categories are identified in Attachment A. Beneficial uses for specific water bodies can be found in the applicable Water Quality Control Plan (Basin Plan) where the recycled water is used. Basin plans establish water quality objectives to protect the specific designated beneficial uses that may include numerical objectives and / or narrative objectives for chemical constituents in and toxicity of groundwater. Basin Plans establish procedures to quantify the maximum permissible concentrations of constituents for groundwaters designated as municipal, agricultural, and other beneficial uses.

PATHOGENIC ORGANISMS

11. To protect public health, this General Permit employs a minimum treatment standard of disinfected tertiary recycled water, as well as exposure control measures including minimum setback distances, signage, method of application, and use restrictions.
12. To protect public health from risks associated with potential cross-connection and subsequent contamination of potable water systems, California Health and Safety Code (HSC) section 116555 requires that a public water system shall ensure that the system will not be subject to backflow under normal operating conditions. HSC Section 116800 et. seq. authorizes local health officers to maintain a program for the control of cross-connections by water users where public exposure to drinking water contaminated by backflow may occur. Cross-connection programs shall be

⁶ Water Code section 13050(f)

conducted in accordance with backflow prevention regulations adopted by CDPH and may require water users to comply with all orders, instructions, regulations, and notices from the local health officer with respect to the installation, testing, and maintenance of backflow prevention devices.

SALINITY & NUTRIENTS

13. The source of salts and nutrients is attributed to water soluble inorganic and organic constituents in imported water, soil leached by irrigation, animal wastes, fertilizers and other soil amendments, municipal use, industrial wastewaters, and oil field wastewaters. These salt sources, all contributors to salinity increases, should be managed in a manner consistent with the Recycled Water Policy, specifically paragraphs 6 and 9(d).
14. Several approaches can be used to manage concerns over salt accumulations in groundwater. In the absence of treatment or a plan to remove accumulated salinity, another viable approach is to manage the rate of degradation by minimizing the salt loads to the groundwater basin. Salinity loads contributed by the reuse of municipal wastewater can be reduced by either precluding anthropogenic derived salts from introduction into the wastewater collection systems (e.g., source control or pretreatment of wastes) or treatment of salts at the wastewater plant (i.e., removal of salts), or both. Another viable option is a salt/nutrient management plan for a groundwater basin. The State Water Board has addressed the topic of salt management, as it concerns recycled water, in the Recycled Water Policy.
15. The agricultural beneficial use of groundwater tends to be the most vulnerable beneficial use to salinity accumulation. This loss of the agricultural beneficial use is not immediate. Control of salinity accumulation is a major part of several Basin Plans, and will be the topic of the salt/nutrient management plans required by the Recycled Water Policy. In general, salt loads reaching a groundwater body must be reduced. Storage of salt in the soil through increased irrigation efficiency is a good practice, but is not a permanent solution.
16. In [Water Quality Order No. 2000-07](#),⁷ the State Water Board determined that a Producer cannot shift responsibility for discharged salt to the User. This General Permit requires the Producer to produce recycled water that meets the quality standards of this General Permit and associated waste discharge requirement order(s) for the wastewater treatment plant(s).
17. In the absence of detailed hydrological data, it is the responsibility of both the project proponent and the California Water Boards to exercise sound and reasoned judgment in evaluating the case-specific effects of proposed projects and the available factual data for each project. This General Permit attempts to accomplish the balancing of factors necessary to evaluate most projects in the absence of case-specific information. In doing so, this General Permit also establishes a basic

⁷ San Luis Obispo Golf & Country Club, Central Coast Region, State Board WQO No. 2000-07, p 10-12

regulatory strategy to manage the salinity of most recycled water used for landscape irrigation. If, after review of the available factual data, the Executive Director determines that the case-specific effects of a proposed project are inconsistent with the requirements of this General Permit and the Recycled Water Policy (i.e., “unusual circumstances” as used in the Recycled Water Policy), the project is not eligible for coverage under this General Permit.

CHLORINE

18. Some Producers and Distributors chlorinate recycled water delivered and stored for reuse to prevent regrowth of pathogens and growth of organisms that could cause odor nuisance and operational difficulties in the reclamation system. Chlorine is toxic to fish and other aquatic life even at low concentrations.

EMERGING CONSTITUENTS/CHEMICALS OF EMERGING CONCERN (CECs)

19. A need exists to increase understanding of CECs that may be present in recycled water used for landscape irrigation. The many evolving issues associated with “emerging contaminants” are presently the subject of a number of studies, including a major study being undertaken by the National Water Research Institute, the Metropolitan Water District of Southern California, and the Orange County Water District (hereafter Study), estimated to be completed in 2009.
20. Many water supply agencies, at their own expense, are developing and implementing voluntary studies based on the best available science intended to better characterize the presence, extent, distribution and persistence of certain unregulated constituents in water supplies. The State Water Board supports these voluntary efforts.
21. As required by the Recycled Water Policy, the State Water Board is convening a CEC advisory panel to provide recommendations on CEC monitoring and other topics. The State Water Board has consulted with CDPH, the primary state agency responsible for the protection of public health and the regulation of drinking water standards, in convening the CEC advisory panel. In accordance with the Recycled Water Policy, this General Permit does not specify CEC monitoring requirements. After the State Water Board takes action on the recommendations of the CEC advisory panel, this General Permit will be reviewed for any needed revisions.
22. The constituents that are the subject of studies subject to the scrutiny of CDPH, the United States Environmental Protection Agency, and the United States Geological Survey, will in all likelihood change over time as their relative importance or unimportance to human health and the environment becomes better known.

UNAUTHORIZED DISCHARGES OF RECYCLED WATER

23. At some Use Areas, recycled water is discharged into landscape irrigation storage ponds (hereafter “impoundments”) that function as storage for irrigation and may also serve an aesthetic purpose. Some impoundments were originally designed and constructed to collect storm water runoff from surrounding areas and allowed to overflow excess water into nearby drainage ways and creeks. Recycled water used for irrigation of golf courses, parks, or other open spaces and landscaped areas may occur in areas containing numerous hills and sloped areas that could promote runoff unless closely managed during irrigation. In some cases, various chemicals (e.g., copper sulfate, acrolein, etc.) may be added to impoundments for weed, algae, and vector control.
24. When Best Management Practices (BMPs) are implemented, conditions causing runoff, ponding, and windblown spray (drift) are minimized to a negligible amount, and in some cases, eliminated. Attachment C of this General Permit includes a list of BMPs, including specific requirements of the Recycled Water Policy.
25. The control of incidental runoff and compliance with regulatory instruments, including National Pollutant Discharge Elimination System (NPDES) permits, is addressed in paragraph 7(a) of the Recycled Water Policy. This General Permit is in conformance with these requirements.

MASTER RECLAMATION PERMITS

26. CWC section 13523.1 authorizes each Regional Water Board, after consulting with CDPH, to issue a master reclamation permit to a Producer or Distributor, or both, of recycled water, in lieu of issuing waste discharge requirements or water recycling requirements.
27. In some cases, especially for municipal wastewater discharges via an ocean outfall, the NPDES permit for the Producer’s facility does not include requirements necessary to ensure the protection of beneficial uses of groundwater resources (e.g., agricultural supply, municipal supply). In order to facilitate the use of recycled water, Regional Water Boards adopt master reclamation permits that implement the Title 22 Requirements and consider potential impacts to the beneficial uses of groundwater. Thereby, some master reclamation permits prescribe discharge limitations necessary to ensure the protection of beneficial uses of groundwater resources not otherwise included in a Producer’s NPDES permit.
28. A benefit of master reclamation permits is that individual recycled water users are not required to seek individual authorization from a regional water board, thereby avoiding additional regulatory burdens and costs. Administrators that operate pursuant to a master reclamation permit shall be allowed to retain coverage under the master reclamation permit. Alternatively, an Administrator may request coverage under this General Permit.

REGULATORY CONSIDERATIONS

29. The discharges authorized by this General Permit are limited to the discharge of disinfected tertiary recycled water (as defined CCR Title 22, sections 60301.230 and 60301.320) produced by a public entity at a municipal wastewater treatment plant. Such wastewater treatment plants will generally maintain the same or similar wastewater treatment operations, involve the treatment of the same or similar types of waste, and require the same or similar treatment standards.

30. Water Code Section 13267(b)(1) states the following:

In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge, waste outside its region that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports

31. Water Code Section 13267(c), in part, states the following:

In conducting an investigation pursuant to subdivision (a), the regional board may inspect the facilities of any person to ascertain whether the purposes of this division are being met and waste discharge requirements are being complied with.

32. Water Code Section 13267(f) states the following:

The state board may carry out the authority granted to a regional board pursuant to [Water Code section 13267] if, after consulting with the regional board, the state board determines that it will not duplicate the efforts of the regional board.

33. The information required by this General Permit is necessary to determine compliance with this General Permit and to ensure compliance with the Water Code and the Title 22 Requirements. Improper use or discharge of recycled water represents a threat to the quality of waters of the state and to human health and the environment. A completed NOI form identifies the entities responsible for ensuring proper production, distribution, and/or use of recycled water in accordance with this General Permit.

34. The information required by this General Permit will not duplicate the efforts of the regional board.
35. In 1977, the State Water Board adopted [Resolution No. 77-1](#), titled “Policy with Respect to Water Reclamation in California” (Resolution No. 77-1). Resolution No. 77-1, in part, encourages the use of recycled water in the state.
36. A 1996 Memorandum of Agreement (MOA) between CDPH and the State Water Board on behalf of itself and the Regional Water Boards regarding the use of recycled water allocates primary areas of responsibility and authority between these agencies. The MOA provides methods and mechanisms necessary to ensure ongoing and continuous future coordination of activities relative to the use of recycled water in California. This General Permit includes requirements consistent with the MOA.
37. In 1968, the State Water Board adopted [Resolution No. 68-16](#) (hereafter the “Antidegradation Policy”) which requires that the authorization to discharge waste maintain high quality waters of the State until it is demonstrated that any change in quality is consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in water quality policies (i.e., will not result in exceedances of water quality objectives).
38. Degradation of groundwater by constituents in recycled water after effective source control, treatment, and control may be determined consistent with maximum benefit to the people of California. This determination is based on considerations of reasonableness under the circumstances of the recycled water use. Factors to be considered include:
 - a. Past, present, and probable beneficial uses of the receiving water (as specified in the applicable basin plan;
 - b. Economic and social costs, tangible and intangible, of the recycled water usage compared to the benefits;
 - c. Environmental aspects of the recycled water usage; and
 - d. Implementation of feasible alternative treatment or control methods.
39. This General Permit establishes terms and conditions of discharge to ensure that the discharge does not unreasonably affect present and anticipated beneficial uses of groundwater and surface water for the following reasons:
 - a. Recycled water will be applied at agronomic rates reflecting the seasonal hydraulic and nutrient requirements of the Use Area;
 - b. The Producer is responsible for ensuring that recycled water meets the quality standards of the General Permit and associated waste discharge requirement order(s) for the municipal WWTP(s); and
 - c. Discharge to surface waters, unless otherwise authorized by an NPDES permit, is prohibited.

40. Degradation of groundwater by some of the typical waste constituents released with discharges from a municipal WWTP after effective source control, treatment, and use control is consistent with maximum benefit to the people of the State. Economic prosperity of State communities and associated industries is of maximum benefit to the people of the State, and therefore sufficient reason to allow limited groundwater degradation, provided that terms of the applicable Water Quality Control Plan and the Recycled Water Policy are met.
41. To comply with this General Permit, Producers and Distributors, must implement (and ensure Users implement) the following treatment and control measures necessary to avoid pollution or nuisance and maintain the highest water quality consistent with the maximum benefit to the people of the state:
 - a. Implement treatment and use standards necessary to produce disinfected tertiary recycled water and implement the applicable Title 22 Requirements;
 - b. Apply recycled water at agronomic rates;
 - c. Identify and implement best management practices;
 - d. Develop, maintain, and implement an Operation & Maintenance Plan; and
 - e. Employ trained personnel (e.g., Recycled Water Use Supervisor)

CALIFORNIA ENVIRONMENTAL QUALITY ACT

42. To mitigate or avoid environmental effects on water quality, this General Permit:
 - a. Requires application of recycled water at reasonable agronomic rates considering soil, climate, and nutrient demand;
 - b. Requires areas irrigated with recycled water be managed to prevent nuisance conditions or breeding of mosquitoes; and
 - c. Establishes a Monitoring and Reporting Program, which includes inspections and regular maintenance of areas irrigated with recycled water.
43. On July 7, 2009, in accordance with California Environmental Quality Act (CEQA),⁸ the State Water Board, acting as the lead agency, adopted Resolution No. 2009-0059 which certified a Mitigated Negative Declaration for this project and determined that the project would have no significant effect on the environment.
44. The State Water Board has notified all known interested agencies and persons of its intent to prescribe general waste discharge requirements for landscape irrigation uses of recycled water and has provided all known interested agencies and persons with an opportunity for a public hearing and an opportunity to submit comments.
45. The State Water Board has consulted with and considered comments from the regional water quality control boards, groundwater management agencies and water replenishment districts with statutory authority to manage groundwater pursuant to their principal act, CDPH, and other interested parties.

⁸ Public Resources Code, Section 21000, et seq.

46. The State Water Board, in a public meeting on July 7, 2009, heard and considered all comments pertaining to this General Permit.

IT IS HEREBY ORDERED that all Producers and Distributors of recycled water, or combinations thereof, that file a complete application package declaring their intention to be regulated under provisions of this General Permit, in order to meet the provisions contained in Division 7 of the Water Code and regulations adopted thereunder, shall comply with the following:

A. PROHIBITIONS

1. The use of recycled water pursuant to this General Permit is prohibited unless the Administrator has submitted a complete Notice of Intent (NOI) form, Operation & Maintenance Plan, and application fee and has received confirmation of enrollment under this General Permit.
2. The use of recycled water in a manner different than described in the Operation & Maintenance Plan is prohibited.
3. The use of recycled water, pursuant to this General Permit, for individually owned residences other than as described in Finding No. 3 is prohibited.
4. In conformance with Title 22 Requirements, recycled water shall not be used for direct human consumption or for the processing of food or drink intended for human consumption.
5. The use of recycled water for uses other than landscape irrigation uses is prohibited.
6. The use of recycled water on water-saturated or frozen ground or during periods of precipitation such that runoff is induced, is prohibited.
7. The direct or indirect discharge from use areas of recycled water to surface waters, either perennial or ephemeral, including wetlands, vernal pools, etc. is prohibited, unless otherwise authorized by an NPDES permit.
8. The application of recycled water within fifty (50) feet of a domestic well, and impoundment of recycled water within one hundred (100) feet of a domestic well, unless approved by CDPH, is prohibited.
9. Use or installation of hose bibbs in areas accessible by the public on any irrigation system presently operating or designed to operate with recycled water, regardless of construction or identification, is prohibited.
10. Use of any equipment or facilities that have been used to convey recycled water (e.g., tanks, temporary piping or valves, and portable pumps) also used for potable water supply conveyance, is prohibited.

11. The discharge or use of recycled water in a manner that causes or contributes to an exceedance of an applicable water quality objective is prohibited.
12. The use of recycled water for landscape irrigation shall not cause or threaten to cause pollution or nuisance as defined in Water Code section 13050.

B. SPECIFICATIONS

1. Recycled water shall be managed in conformance with the applicable regulations contained in the Title 22 Requirements.
2. All recycled water provided to Users pursuant to this General Permit, shall be treated in and managed in conformance with all applicable provisions of the Recycled Water Policy.

Disinfected Tertiary Recycled Water Criteria

3. The Producer or Distributor shall collectively provide all Users disinfected tertiary recycled water that meets the standards for *disinfected tertiary recycled water* as described in CCR Title 22, sections 60301.230 and 60301.320.

Recycled Water Application

4. Application of recycled water to the Use Area shall be at reasonable agronomic rates and shall consider soil, climate, and nutrient demand. Application rates shall ensure that a nuisance is not created. Degradation of groundwater, considering soil, climate, and nutrient demand, shall be minimized consistent with applicable provisions of the Recycled Water Policy.
5. The seasonal nutritive loading of the Use Area including the nutritive value of organic and chemical fertilizers and of the recycled water, shall not exceed the nutritive demand of the landscape.
6. Use Areas that are spray irrigated and allow public access shall be irrigated during periods of minimal use. Consideration shall be given to allow maximum drying time prior to subsequent public use.

Recycled Water Utilities, Equipment, Signage, and Use Areas

7. All newly installed or any accessible reclamation equipment, pumps, piping, valves, and outlets shall be appropriately marked to differentiate them from potable facilities. All newly installed or any accessible reclamation distribution system piping shall be purple or adequately identified with purple tape, tags, or stickers per Section 116815(a) of the California Health and Safety Code.
8. Except as allowed under Section 7604 of Title 17, California Code of Regulations, no physical connection shall be made or allowed to exist between any recycled water system and any separate system conveying potable water. Supplementing recycled water with potable water shall not be allowed except as approved by CDPH.
9. A 4-foot horizontal and 1-foot vertical separation⁹ shall be maintained between all new pipelines transporting recycled water and those transporting domestic water, unless approved by CDPH. Domestic water pipelines shall be configured above recycled water pipelines, unless approved by CDPH.
10. All recycled water valves, outlets, and quick couplers should be of a type or secured in a manner that only permits operation by authorized personnel.
11. The main shutoff valve of the recycled water meter shall be tagged with a recycled water warning sign. The valve shall be equipped with an appropriate locking device to prevent unauthorized operation of the valve.
12. Except where CDPH has approved alternative signage and wording or an educational program pursuant to Title 22 Requirements, (1) all use areas where recycled water is used that are accessible to the public shall be posted with signs that are visible to the public in a size no less than four inches high by eight inches wide that include the following wording “RECYCLED WATER-DO NOT DRINK”, and (2) each sign shall display an international symbol similar to that shown in Attachment D.
13. Spray, mist, or runoff of recycled water shall not enter dwellings, designated outdoor eating areas, or food handling facilities. Drinking water fountains shall be protected against contact with recycled water spray, mist or runoff.
14. Recycled water shall be managed to minimize contact with workers.
15. Best Management Practices (BMPs) shall be developed and implemented to achieve a safe and efficient irrigation system. At a minimum, the Administrator shall implement and ensure that all other Producers,

⁹ As measured from the nearest outside edge of the respective pipelines.

Distributors, and Users associated with each respective NOI implement the Required BMPs identified in Attachment C (I.A. – I.D.) and consider implementing other BMPs as appropriate.

16. Recycled water shall not be allowed to escape from the Use Area by overspray, mist or by surface flow except in minor amounts such as that associated with BMPs for good irrigation practices.
17. Areas irrigated with recycled water shall be managed to prevent ponding and conditions conducive to the proliferation of mosquitoes and other vectors, and to avoid creation of a public nuisance or health hazard. The following practices shall be implemented, at a minimum:
 - a. Irrigation water must infiltrate completely within a 48-hour period.
 - b. Ditches receiving irrigation runoff, not serving as wildlife habitat, shall be maintained free of emergent, marginal, and floating vegetation.
 - c. Low-pressure and unpressurized pipelines and ditches that may be accessible to mosquitoes shall not be used to store recycled water.
18. The Producer or Distributor shall discontinue delivery of recycled water during any period in which either has reason to believe that the requirements for use as specified herein or the requirements of CDPH are not being met. The delivery of recycled water shall not resume until all conditions have been corrected.

C. PROVISIONS

1. A duly authorized representative for each Producer and Distributor shall each sign the completed NOI form (Attachment B). Enforcement actions for violations of this General Permit may be taken against all responsible entities for violations of any part of this General Permit. However, in general, responsibilities for Producers and Distributors are as follows:
 - a. Producers shall be responsible for ensuring that recycled water meets the quality standards of this General Permit and any associated waste discharge requirement order(s) for the WWTP(s).
 - b. Distributors shall be responsible for the operation and maintenance of transport facilities and associated appurtenances necessary to convey and distribute the recycled water from the point of production to the point of use with all applicable Title 22 requirements.
 - c. The Producer and Distributor shall be responsible for the application and use of recycled water in the respective Use Areas and for associated operations and maintenance in accordance with all applicable Title 22 requirements and this General Permit. The Producer and Distributor are also responsible for ensuring that Users maintain the minimum land application acreage and impoundment

capacity to comply with the terms and conditions of this General Permit.

2. The Administrator shall comply with Monitoring and Reporting Program No. 2009-0006-DWQ and revisions thereto, as specified by the Executive Director.
3. CDPH may identify in its recommendations with respect to the proposed recycled water use any conditions upon which its approval of a proposed project is based. "Conditions of approval" submitted as part of CDPH's recommendations will be incorporated into a Notice of Applicability for the proposed recycled water use project.
4. The Administrator shall require each User to designate a Recycled Water Use Supervisor for each Use Area, respectively. The Recycled Water Use Supervisor shall be responsible for the recycled water system within the Use Area. Specific responsibilities of the Recycled Water Use Supervisor, at a minimum, shall include the following:
 - a. Proper installation, operation and maintenance of irrigation systems;
 - b. Control of on-site piping to prevent any cross-connections with potable water supplies;
 - c. Development of and implementation of a set of procedures to verify on an ongoing basis that cross-connections have not occurred between potable water supplies and recycled water supplies;
 - d. Routine inspection and maintenance of backflow prevention devices installed to protect potable water supplies, consistent with section 7605 of Title 17, California Code of Regulations; and
 - e. General responsibilities to ensure compliance with this General Permit and continuous implementation of any Best Management Practices identified as necessary to prevent potential hazards to public health and to protect the environment.
5. Prior to commencing irrigation with recycled water, the Administrator shall submit an Operations and Maintenance Plan (O&M Plan) to the State Water Board. An O&M Plan shall contain the following elements:
 - a. An Operations Plan. A detailed operations plan for the Use Areas including methods and procedures for implementation of regulations regarding recycled water use and maintenance of equipment and emergency backup systems to maintain compliance with the conditions of this General Permit and CDPH requirements (i.e., identification of BMPs implemented to achieve and maintain compliance).
 - b. An Irrigation Management Plan. The Irrigation Management Plan shall include measures to ensure the use of recycled water occurs at an agronomic rate while employing practices to ensure irrigation

efficiency necessary to minimize application of salinity constituents (by mass) to Recycled Water Use Areas. The Irrigation Management Plan shall be applicable for each Recycled Water Use Area served and shall account for the following:

- i. Soil characteristics;
- ii. Recycled water characteristics (nutrients, including nitrogen and phosphorous content; specific ion toxicity, including chloride, boron, sodium, bicarbonate; and other parameters);
- iii. General requirements of the major plant species being irrigated (e.g., seasonal demand, climate, nutrient requirements);
- iv. Climatic conditions (e.g., precipitation, evapotranspiration rate, wind);
- v. Other supplemental nutrient additions (e.g., chemical fertilizers) generally used within the Use Area; and
- vi. Management of impoundments used to store or collect recycled water.

Where conditions 5.b.i. thru 5.b.vi vary substantially across a service area, the Irrigation Management Plan shall also include sub-basin irrigation management plans that ensure the use of recycled water occurs at an agronomic rate while employing practices to ensure irrigation efficiency necessary to minimize application of salinity constituents (by mass).

- c. A summary of the applicable approved Title 22 Engineering Report submitted to CDPH. The summary of the Title 22 Engineering Report shall address the following:
 - i. Method(s) of wastewater treatment and manner for achieving disinfected tertiary recycled water;
 - ii. Method(s) to be used to assure that the installation and operation of the recycled system will not result in cross-connections between the recycled water and potable water piping systems.
 - iii. Any recommendations or “conditions of approval” provided by CDPH;
 - iv. Copy of any approval letter(s) prepared by CDPH¹⁰.Administrators may provide a copy of the complete approved Title 22 Engineering Report in lieu of a summary. The Title 22 Engineering Report shall be available upon request for review and inspection.
- d. A copy of the Producer’s or Distributor’s established rules and/or regulations as approved by CDPH for Producers, Distributors and Users governing the design and construction of recycled water use facilities and the use of recycled water in accordance with the criteria established in the Title 22 Requirements and this Permit.

¹⁰ Formerly, the California Department of Health Services

- e. A copy of the written (and signed) agreement between the respective parties responsible for the producing, distributing, and using the recycled water.
 - f. Recycled Water Use Supervisor responsibilities and training.
 - i. Documentation of or examples from a training program including periodic education, for Recycled Water Use Supervisors. At a minimum, such training programs shall include the following elements:
 - (1) The safe and efficient operation and maintenance of recycled water use facilities.
 - (2) Prevention of runoff from Recycled Water Use Areas.
 - (3) Matching irrigation rates to the water requirements of the landscape, and not applying when the soil is saturated.¹¹
 - (4) Means for ensuring recycled water and other supplemental nutrients (including fertilizers) are used pursuant to the Irrigation Management Plan (i.e., at agronomic rates¹²)
 - (5) Prevention of cross-connections with potable water systems
 - ii. A copy of an example duty statement for the Recycled Water Use Supervisor responsible for the Use Area.
 - iii. Verification that the Recycled Water Use Supervisor has attended training regarding the safe and efficient operation and maintenance of recycled water use facilities.
6. Producers and Distributors shall maintain and comply with the O&M Plan, and all portions thereof including the Irrigation Management Plan submitted pursuant to this General Permit and the applicable Title 22 Engineering Report.
7. Amendments to the approved Title 22 Engineering Report as well as a description of new use sites shall be submitted to the appropriate public health authority for approval in advance of connection. The Administrator shall include in the annual report submitted to the State Water Board copies of approval letter(s) prepared by CDPH regarding (1) such amendments to the Title 22 Engineering Report and (2) a description of new sites.
8. The Administrator shall ensure that all Users comply with the O&M Plan, and all relevant portions thereof including the Irrigation Management Plan submitted pursuant to this General Permit and the applicable approved Title 22 Engineering Report. To demonstrate compliance with this Provision, the Administrator may develop a pamphlet, brochure, or other educational materials, that convey the key operational elements (e.g., prevention of cross-connections, how to adjust fertilization rates, impoundment management practices, etc.) of the O&M Plan to the Recycled Water Use

¹¹ Accounting for soil saturation conditions

¹² Including accounting for fertilizers

Supervisor. The Administrator shall also ensure compliance with any applicable Salt and Nutrient Management Plans.

9. The Administrator shall ensure that periodic inspections are conducted of the Use Areas they supply at a frequency approved by CDPH (but no less than annually), including an adaptive approach to address Use Areas with a record of compliance concerns. The Administrator shall also establish procedures to monitor and assure compliance with conditions of this General Permit. The Administrator shall also ensure that regular inspections occur to assure cross-connections with potable water systems are not made and air-gap devices are installed and operable.
10. The Producer and Distributor shall keep a copy of the O&M Plan and this General Permit, including its Monitoring and Reporting Program, and attachments in a location where they can be easily referenced by operating personnel. Key operating personnel, including the Recycled Water Use Supervisor, shall be familiar with its contents.
11. The Producer and Distributor shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed to achieve compliance with the conditions of this General Permit.
12. All technical reports required herein that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code¹³. To demonstrate compliance with sections 415 and 3065 of Title 16, CCR, all technical reports must contain a statement of the qualifications of the responsible registered professional(s). As required by these laws, completed technical reports must bear the signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.
13. All storm water discharges, including conditionally authorized or exempted non-storm water discharges, from recycled water use areas must comply with the lawful requirements of municipalities, counties, drainage districts, and/or other local agencies, regarding discharges of storm water to Municipal Separate Storm Sewer Systems (MS4s) under their jurisdiction.
14. It is the responsibility of the Producer and Distributor to make inquiry and to obtain any local, state, and federal governmental agency permits or authorizations prior to the distribution and use of recycled water for landscape irrigation.

¹³ sections 6735, 7835, and 7835.1

15. Coverage under this General Permit is not transferable. The Administrator shall notify the Executive Director in writing at least thirty (30) days in advance of change in ownership related to the Administrator, other Distributors, or Producers authorized to use recycled water pursuant to this General Permit. The Administrator shall use the Notice of Termination (NOT) form in Attachment E to satisfy this provision.
16. The Administrator shall require Users to notify the Administrator in writing within thirty (30) days of any changes to Recycled Water Use Supervisor personnel or changes to contact information for the Recycled Water Use Supervisor.
17. Upon enrollment in this General Permit, if the Producers or Distributors are subject to general or individual waste discharge requirements or water reclamation requirements, the provisions of such requirements are null and void to the extent that the recycled water use is regulated by this General Permit.
18. The State Water Board will review this General Permit periodically and will revise requirements when necessary. Specifically, monitoring requirements could be revised to include CEC monitoring, if the State Water Board finds such monitoring to be necessary and appropriate, based on recommendations from the CEC Advisory Panel. Furthermore, the State Water Board would modify this General Permit if a regulatory or statutory change occurs that affects the application of the General Permit, or as necessary to ensure protection of beneficial uses. This General Permit may also be modified, rescinded and reissued, for cause. The Executive Director may also terminate coverage under this General Permit for cause. The Executive Director is hereby authorized to revise the Monitoring and Reporting Program and Attachments B, C, D, E, and F of this General Permit. Causes for modification or termination of coverage include, but are not limited to, changes to statutes, the promulgation of new regulations, adoption of new policy, modification to water quality control plans, Regional Water Board finding of “unusual circumstances” per the Recycled Water Policy, or other changes determined necessary to protect beneficial uses of waters of the state.

CERTIFICATION

The undersigned, Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held on July 7, 2009.

AYE: Chairman Charles R. Hoppin
Vice Chair Frances Spivy-Weber
Board Member Arthur G. Baggett, Jr.
Board Member Tam M. Doduc

NAY: None

ABSENT: None

ABSTAIN: None



Jeanine Townsend
Clerk to the Board

**STATE WATER RESOURCES CONTROL BOARD
MONITORING AND REPORTING PROGRAM NO. 2009-0006-DWQ
GENERAL PERMIT FOR
LANDSCAPE IRRIGATION USES OF MUNICIPAL RECYCLED WATER**

This Monitoring and Reporting Program (MRP) is issued pursuant to California Water Code section 13267(f). All samples should be representative of the volume and nature of the discharge or matrix of material sampled. The time, date, and location of each sample shall be recorded on the sample chain of custody form. All analyses shall be performed in accordance with the latest edition of *Guidelines Establishing Test Procedures for Analysis of Pollutants*, promulgated by the United States Environmental Protection Agency (U.S. EPA) or other procedures approved by the Executive Director. In reporting monitoring data, the Administrator shall indicate whether any analysis was performed using a method not in conformance with U.S. EPA's Guidelines.

RECYCLED WATER PRODUCTION AND USE

For basins where the Regional Water Board has adopted a Salt and Nutrient Management Plan, compliance with any monitoring and reporting requirements of the Salt and Nutrient Management Plan is to be used in lieu of the monitoring schedule below.

Recycled water quality characteristics, based on data included in the monthly reports provided by the Producer to the Regional Water Board, shall be used in calculations to ascertain loading rates. For basins where a Regional Water Quality Control Board has not adopted a Salt and Nutrient Management Plan, the Administrator shall monitor recycled water production, distribution, and use within its service area for each respective basin / sub-basin (Attachment F) for the following parameters:

<u>Parameter</u>	<u>Units</u>	<u>Sample Type</u>	<u>Frequency</u>	
			Sampling	Reporting
Volume of recycled water ^{1, 2}	acre-feet	Varies	Monthly ³	Annual
Total number of use areas / basin ⁴	--	Observation	Annual	Annual
Total area of application	Acres	Observation	Monthly	Annual
Nitrogen application rate ^{5, 6}	lbs/acre/month	Calculated	Monthly	Annual
Salinity application rate ⁷	lbs/acre/month	Varies ¹	Monthly	Annual

¹ Estimation of the volume of recycled water shall not include other potable or non-potable "make-up" water also used to irrigate landscape, if any.

² May be estimated based on daily percentage of recycled water supplied via a non-potable water supply system.

³ May be estimated based on available data (e.g., meters read every other month or quarterly)

⁴ This parameter represents the total number of use areas within the Administrator's service area with each respective basin / sub-basin.

⁵ Nitrogen application rate shall consider nutrients contained in the recycled water, based on monthly analytical data provided by the Producer to the Regional Water Board.

⁶ Nitrogen concentrations shall be calculated and reported "as N." For example, nitrate-nitrogen = 27 mg/L of (as NO₃) shall be converted and reported as nitrate-nitrogen = 6 mg/L (as N).

⁷ Salinity application rate shall be calculated using the applied volume of recycled, actual application area, the most recent results for the concentration of total dissolved solids in the recycled water.

MONITORING AND REPORTING PROGRAM NO. 2009-0006-DWQ

Each month, the Administrator shall also verify that the recycled water has been filtered and disinfected consistent with criteria for disinfected tertiary recycled water. Based on monthly compliance data provided by the Producer to the Regional Water Board, the Administrator shall track turbidity¹ and disinfection^{2,3} parameters. Exceedances of turbidity or disinfection standards⁴ shall be documented and explained.

Each Producer and Distributor shall retain records of all monitoring information including all calibration and maintenance records, copies of all reports required by this General Permit, and records of all data used to complete the application for this General Permit. Records shall be maintained for a minimum of three years from the date of the sampling, measurement, or report. This period may be extended during the course of any unresolved investigation or litigation regarding the recycled water operation or when requested by the Executive Director.

The Administrator shall also ensure that Producers report priority pollutants to the Regional Water Board semiannually, in accordance with paragraph 7(b)(4) of the Recycled Water Policy.

ADMINISTRATOR REPORTING

By the 15 of April of each year, the Administrator shall compile information for each basin/sub-basin within its service area consistent with the format identified in Attachment F and submit the compilation to the State Water Board. The compilation shall also contain the following items:

1. A summary and discussion of the compliance record for the reporting period. If violations have occurred, the report shall also discuss the corrective actions taken and planned to bring the discharge into full compliance with this General Permit; and
2. A description of the measures employed by the Administrator during the reporting period to conduct periodic inspections of the Use Areas. The description shall include the following elements: date of inspections, description of any violations identified during the reporting period including any indications of unauthorized cross-connections, and all actions taken or planned for correcting violations, such as operation or facility modifications.

The periodic inspection shall also include an evaluation verifying that the application of recycled water to the Use Area occurs at reasonable agronomic rates. The agronomic rate evaluation shall consider all applied nutrients from all sources (directly applied and as contained in the recycled water) the seasonal nutrient demand for the specific plants being grown; soil; and climate. If the agronomic rate evaluation determines that

¹ Nephelometric Turbidity Units (NTU)

² For chlorine disinfection processes, use the product of total chlorine residual and modal contact time measured at the same point, CT (mg/L-min)

³ For other disinfection processes, the Administrator shall report using appropriate applicable standards (e.g., minimum ultra violet dose or ozone CT)

⁴ Title 22, Sections 60301.320, 60301.230 (a), and 60301.230 (b)

MONITORING AND REPORTING PROGRAM NO. 2009-0006-DWQ

exceedances of the agronomic rate may be occurring, the Administrator shall implement corrective actions to ensure recycled water use occurs at reasonable agronomic rates.

If the Administrator has previously submitted a report describing corrective actions and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory.

3. A description of approved amendments to the Title 22 Engineering Report, if any.
 - A description of new use sites approved by CDPH. The description shall include information necessary for the CDPH to evaluate new use sites pursuant to the Title 22 Requirements. Examples of necessary information may include location of backflow prevention devices, drinking fountains, groundwater wells, et cetera.
 - Copies of approval letter(s) prepared by CDPH regarding such amendments to the Title 22 Engineering Report.

All reports submitted in response to this General Permit shall comply with the signatory requirements. Monitoring data and/or discussions submitted concerning wastewater treatment plant performance must also be signed and certified by the chief plant operator.

The Administrator shall implement the above monitoring program on the first day of the month following the issuance of the Notice of Applicability. Annual monitoring reports shall be submitted to the State Water Board. Additional information regarding the appropriate place to submit annual reports will be available on-line at the State Water Board's website⁵.

SPILL REPORTING

1. The Administrator shall ensure the Producer or Distributor reports any noncompliance that may endanger human health or the environment. The Producer or Distributor shall immediately report orally, or electronically if available, information of the noncompliance as soon as (1) the Producer or Distributor has knowledge of the discharge, (2) notification is possible, and (3) notification can be provided without substantially impeding cleanup or other emergency measures, to the appropriate Regional Water Board office⁶.

A written report shall also be provided to the State Water Board within five (5) business days of the time the Producer or Distributor becomes aware of the incident. The written report shall contain a description of the noncompliance and its cause, the period of noncompliance, the anticipated time to achieve full compliance, and the steps taken or planned, to reduce, eliminate, and prevent recurrence of the noncompliance.

2. The unauthorized discharge of 50,000 gallons or more of "disinfected tertiary recycled water" shall be reported as described in Spill Reporting No. 1. The unauthorized discharge of 1,000 gallons or more of "disinfected tertiary recycled water" shall be reported to the appropriate Regional Water Board office as soon as possible, but no later than seventy-two (72) hours after becoming aware of the unauthorized discharge.

⁵ http://www.waterboards.ca.gov/water_issues/programs/water_recycling_policy/landscape_irrigation_general_permit.shtml

⁶ http://www.waterboards.ca.gov/waterboards_map.shtml

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SIGNATORY REQUIREMENTS

All application reports or information to be submitted to the State Water Board shall be signed and certified by a duly authorized representative as follows:

1. For a corporation – by a principal executive officer or at least the level of vice president.
2. For a partnership or sole proprietorship – by a general partner or the proprietor, respectively.
3. For a municipality, state, federal, or other public agency – by either a principal executive officer or ranking elected official.

A duly authorized representative of a person may sign documents if:

- a. The authorization is made in writing by a person described in Signatory Requirements paragraphs 1, 2, or 3.
- b. The authorization specifies either an individual or position having responsibility for the overall operation of the regulated facility or activity; and
- c. The written authorization is submitted to the Executive Director.

Any person signing a document pursuant to this MRP shall make the following certification:

I declare under the penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment for knowing violations.

ATTACHMENT A - DEFINITIONS

WATER QUALITY ORDER NO. 2009-0006-DWQ

GENERAL PERMIT FOR LANDSCAPE IRRIGATION USES OF MUNICIPAL RECYCLED WATER

Within this General Permit, the following terms are defined as follows:

- a. Administrator: Either a Producer or Distributor designated to administer a recycled water program necessary to fulfill the requirements of this General Permit.
- b. Agronomic Rate: The rate of application of recycled water to plants that is necessary to satisfy the plants' watering and nutritional requirements, considering supplemental water (e.g., precipitation) and supplemental nutrients (e.g., fertilizers), while preventing or strictly minimizing the amount of nutrients that pass beyond the plants' root zone.
- c. Basin: See *Groundwater Basin*
- d. Beneficial Uses: Uses of the waters of the state that may be protected against quality degradation. Uses include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.
- e. California Department of Public Health (CDPH): The primary State agency responsible for protection of public health and the regulation of drinking water. The Legislature has defined several specific regulatory responsibilities of CDPH related directly or indirectly to recycled water use activities including establishment of statewide water reclamation criteria advising Regional Water Boards in the drafting of water reclamation requirements; review and approval of certain proposed water reclamation projects; abatement of contamination resulting from use of reclaimed water where public health is seriously threatened; and control of cross-connections between potable and nonpotable water systems.
- f. Disinfected Tertiary Recycled Water: Filtered and subsequently disinfected wastewater that meets the criteria defined in CCR Title 22, sections 60301.230 and 60301.320
- g. Distributor: Any combination, either in whole or in part, of a *Recycled Water Wholesaler, Recycled Water Supplier, or Recycled Water Retailer*.
- h. Drift: The water that escapes to the atmosphere as water droplets from a cooling system (Title 22, section 60301.240)

**ATTACHMENT A – DEFINITIONS
WATER QUALITY ORDER NO. 2009-0006-DWQ**

- i. Emerging Constituents/Chemicals of Emerging Concern (CECs): Any synthetic or naturally occurring chemical or any microorganism that is not commonly monitored in the environment but has the potential to enter the environment and cause known or suspected adverse ecological and/or human health effects. In some cases, release of emerging chemical or microbial contaminants to the environment has likely occurred for a long time, but may not have been recognized until new detection methods were developed. In other cases, synthesis of new chemicals or changes in use and disposal of existing chemicals can create new sources of CECs. Chemicals that have been known to be discharged at given concentrations for which protective objectives have not been established may also be identified as CECs.
- j. Engineering Report: The report filed with CDPH to produce or supply recycled water for direct reuse. The report shall clearly indicate the means for compliance with the Title 22 Requirements. (Title 22 section 60323)
- k. Groundwater Basin (basin). Groundwater resources delineated by either the California Department of Water Resources, a Water Quality Control Plan, special act, or court order.
- l. Hose Bibb: A faucet or similar device to which a common garden hose can be readily attached (Title 22 section 60301.400)
- m. Incidental Runoff: Unintended small amounts (volume) of runoff from recycled water use areas, such as over-spray from sprinklers that escapes the recycled water use area. Water leaving a recycled water use area is not considered incidental if it is part of the facility design, if it is due to excessive application, if it is due to intentional overflow or application, or if it is due to negligence.
- n. Irrigation Management Plan: All applied nutrients from all sources (directly applied and as contained in the recycled water) and the agronomic application rate and seasonal need for the specific plants being grown to assure that nutrients are not applied beyond the vegetative uptake rate and discharged into the environment.
- o. Producer: See *Recycled Water Producer*.
- p. Recycled Water: Water which, as a result of treatment of municipal wastewater, is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is therefore considered a valuable resource. "Recycled water" and "reclaimed water" have the same meaning.¹

¹ California Water Code section 26

**ATTACHMENT A – DEFINITIONS
WATER QUALITY ORDER NO. 2009-0006-DWQ**

- q. Recycled Water Producer (Producer): Any public entity that produces recycled water. This includes public entities that further treat or enhance the quality of recycled water supplied by wastewater treatment facilities.
- r. Recycled Water Retailer (Distributor): As defined in Water Code section 13575(7), any retail water supplier in whose service area is located the property to which a customer requests the delivery of recycled water services.
- s. Recycled Water Supplier (Distributor): As defined in Water Code section 13575(6), any local entity, including a public agency, city, county, or private water company, that provides retail water service.
- t. Recycled Water Use Area (Use Area): An area where recycled water is to be used pursuant to this General Permit which is defined by its boundaries or project area (e.g. a golf course, residential neighborhood, school yard, park, etc.) so as to be consistent with Title 22 section 60301.920.
- u. Recycled Water User (User): A person or entity that uses recycled water.
- v. Recycled Water Wholesaler (Distributor): As defined in Water Code section 13575(5), any public entity that distributes recycled water to retail water suppliers and which has constructed, or is constructing, a recycled water distribution system.
- w. Salt and Nutrient Management Plans: Salt and nutrient plans shall be tailored to address the water quality concerns in each basin/sub-basin and may include constituents other than salt and nutrients that impact water quality in the basin/sub-basin. Such plans shall address and implement provisions, as appropriate, for all sources of salt and/or nutrients to groundwater basins, including recycled water irrigation projects.
- x. Unauthorized Discharge: (Water Code section 13529.2) Discharge of recycled water, without regard to intent or negligence, not authorized by waste discharge requirements issued pursuant to Water Code sections 13260-13274 (e.g., RWD, WDRs, waiver, etc.), 13523 (i.e., WRRs), or 13523.1 (i.e., Master Reclamation Permit).
- y. User: See *Recycled Water User*.
- z. Water Quality Objectives: The limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area.
- aa. Water Recycling Criteria: Uniform statewide recycling criteria established in California Code of Regulations Title 22 by CDPH for each varying type of use of recycled water where the use involves the protection of public health (Water Code section 13521).

ATTACHMENT B - NOTICE OF INTENT (NOI)

FOR COVERAGE PURSUANT TO WATER QUALITY ORDER NO. 2009-0006-DWQ

**GENERAL PERMIT FOR
LANDSCAPE IRRIGATION USES OF MUNICIPAL RECYCLED WATER**

I. Distributor (Required)¹:

Agency / Organization / Name:			
Facility, if any:			
Conveyance Role (Check all that apply): <input type="checkbox"/> Recycled Water Retailer <input type="checkbox"/> Recycled Water Supplier <input type="checkbox"/> Recycled Water Wholesaler		Distributor declares responsibility for administering program necessary to fulfill the requirements of this General Permit: <input type="checkbox"/> Yes <input type="checkbox"/> No	
Description of Recycled Water Conveyance Role:			
Existing Water Reclamation Requirements (if any):		Do you request to rescind the identified existing WRRs? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Mailing Address:			
City:	County:	State:	Zip:
Phone Number:		Fax Number:	
Contact Person:		E-Mail:	

II. Producer (Required)¹:

Agency / Organization:			
Facility:			
Producer declares responsibility for administering program necessary to fulfill the requirements of this General Permit: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Order Number:	WDID:	Treatment: <input type="checkbox"/> Disinfected Tertiary ² <input type="checkbox"/> Advanced ³	
Existing Water Reclamation Requirements (if any):		Do you request to rescind the identified existing WRRs? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Mailing Address:			
City:	County:	State:	Zip:
Phone Number:		Fax Number:	
Contact Person:		E-Mail:	

¹ Attach multiple sheets if necessary; only one administrator of this General Permit is allowed per NOI.

² As defined in California Code of Regulations Title 22, sections 60301.230 and 60301.320

³ Achieves "disinfected tertiary" quality and includes additional treatment.

**ATTACHMENT B – NOTICE OF INTENT (NOI)
WATER QUALITY ORDER NO. 2009-006-DWQ**

III. Billing Address (Required):

Agency / Organization / Name:			
Mailing Address:			
City:	County:	State:	Zip:
Phone Number:		Fax Number:	
Contact Person:		E-Mail:	

IV. Salt and Nutrient Management Plans (required)

For projects where Salt and Nutrient Management Plan is in effect.
<p>Salt and Nutrient Management Plan, approved by a Regional Water Board?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No; check one of the two boxes below:</p> <p><input type="checkbox"/> Under development, estimated completion date: I am actively participating in this development effort.</p> <p><input type="checkbox"/> No organized effort to develop a Salt and Nutrient Management Plan for the basin exists at this time. I will actively participate in the development of a Salt and Nutrient Management Plan when the effort commences.</p>
For projects where Salt and Nutrient Management Plan is not in effect.
<p>Antidegradation analysis completed consistent with Recycled Water Policy Paragraph 9d.(2)? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>

V. Certification (Required):

<p><i>I hereby agree to meet and follow the requirements set forth in Water Quality Order No. 2009-0006-DWQ. I also agree to adhere to the Operation & Maintenance Plan, submitted herewith, and to ensure the proper use of recycled water for landscape applications. I also agree that, where an applicable Salt and Nutrient Management Plan is adopted by a Regional Water Board, I will ensure full compliance by all producers and distributors under this permit to any monitoring and reporting elements therein. Upon approval of coverage under the General Permit I will assume responsibility for administering an appropriate program necessary to fulfill the requirements of Water Quality Order No. 2009-0006-DWQ. I declare under the penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment.</i></p>		
I.	Signature of Administrator:	Title:
	Printed or Typed Name:	Date:

**ATTACHMENT B – NOTICE OF INTENT (NOI)
WATER QUALITY ORDER NO. 2009-006-DWQ**

I hereby agree to meet and follow the requirements set forth in Water Quality Order No. 2009-0006-DWQ. I also agree to adhere to the Operation & Maintenance Plan, submitted herewith, and to ensure the proper use of recycled water for landscape applications. I declare under the penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment.

I.	Signature of Distributor ^{4,5} :	Title:
	Printed or Typed Name:	Date:
II.	Signature of Producer ⁶ :	Title:
	Printed or Typed Name:	Date:

⁴ For additional distributors other than the Administrative Distributor.

⁵ Attach multiple sheets if necessary.

⁶ Attach multiple sheets if necessary.

ATTACHMENT C

BEST MANAGEMENT PRACTICES (BMPs)

WATER QUALITY ORDER NO. 2009-0006-DWQ

GENERAL PERMIT FOR LANDSCAPE IRRIGATION USES OF MUNICIPAL RECYCLED WATER

This menu of potential Best Management Practices (BMPs) identifies some practices for the management of the production, distribution, and use of recycled water that, in addition to requirements in law¹, will help ensure the safe and efficient use of recycled water. Many of these BMPs are also intended to minimize or eliminate conditions that cause runoff, ponding, and windblown spray (drift). Recycled Water Specification B.15 requires the Administrator to implement and ensure that all other Producers, Distributors, and Users associated with each respective NOI implement the Required BMPs identified in Section I and to consider implementing other BMPs (Sections II – IV) as appropriate for a Recycled Water Use Area.

I. REQUIRED BMPs

- A. Implementation of operations and management plan that provides for detection of leaks, and correction either within 72 hours of learning of a leak, or prior to the release of 1,000 gallons.
- B. Proper design and operation of sprinkler heads.
- C. Refraining from application during precipitation events.
- D. Management of any impoundment such that no discharge occurs unless the discharge is a result of a 25-year, 24-hour storm event or greater. In the event of an unauthorized discharge, the Executive Officer of the appropriate Regional Water Board shall be notified, as described in Provision C.16.

II. OTHER POTENTIAL BMPs: GENERAL OPERATIONAL CONTROLS

- A. The Recycled Water Use Supervisor attends regular training regarding the safe and efficient operation and maintenance of recycled water use facilities.
- B. The Recycled Water Use Supervisor ensures that all recycled water facilities are maintained, operated and repaired at all times in a manner that does not cause illness or injury to any person and in a manner that does not cause damage or injury to the real or personal property of any person or entity.
- C. Where feasible, different piping materials are used to assist in water system identification.

¹ Water Code, Health and Safety Code, California Code of Regulations, etc.

**ATTACHMENT C – BEST MANAGEMENT PRACTICES (BMPS)
WATER QUALITY ORDER NO. 2009-0006-DWQ**

III. OTHER POTENTIAL BMPs: WORKER/PUBLIC PROTECTION

- A. Workers, residents, and the public are made aware of the potential health risks associated with contact or ingestion of recycled water, and are educated about proper hygienic practices to protect themselves and their families.
- B. Workers are provided with the appropriate safety equipment and clothing during prolonged contact with recycled water.
- C. Potable drinking water is provided for workers.
- D. Toilet and washing facilities are provided.
- E. Precautions are taken to avoid contact of recycled water with food and food is not allowed into areas that are still wet with recycled water.
- F. A first aid kit is available on site, to prevent the contact of cuts and other injuries with recycled water.

IV. OTHER POTENTIAL BMPs: EFFICIENT IRRIGATION

Hardware:

- A. All irrigation systems have the appropriate equipment/hardware for the application.
- B. Irrigation system installed according to the design.
- C. Irrigation system is designed to provide as much flexibility as possible for the operation of the irrigation system.
- D. All sprinkler heads are uniform in brand, model and nozzle size. Where different arcs are needed at the same station, matched precipitation rates by changing nozzles.
- E. Sprinkler heads placed per manufacturer's recommendations and based on measured spacing between sprinkler heads.
- F. Where lower precipitation rates are required, such as on slopes, reduced nozzle size and spray angle per manufacturer's recommendations.
- G. Installed booster pumps to increase pressure where needed.
- H. Installed pressure reducers to decrease pressure where needed.
- I. Pipes sized to convey water in the quantity required by the system.
- J. Check valves installed either in-line or built into the sprinkler head assembly to minimize low head drainage after the valve has closed.
- K. Automatic flow control devices installed that shut down a system if a break or other similar high flow/low pressure situation develops during irrigation.
- L. Use centralized control systems or controllers that measure or can be programmed to use evaporation rates, or systems that use controls such as moisture sensors.

Maintenance:

- M. Routinely adjust sprinkler heads so they achieve 80% head to head coverage throughout their intended arc. There are no obstructions that would interfere with the free rotation and smooth operation of any sprinkler, (e.g., trees, tall grass, shrubs, signs, etc.). The system is routinely tested so adjustments can be made.
- N. Routinely adjust valves or pressure regulators so that the systems are operating at the pressure required by the sprinkler heads or emitters. Routinely test pressures periodically with a pressure gauge to maintain appropriate pressure levels.
- O. Routinely test the accuracy of time clocks and recalibrate or repair as necessary.

**ATTACHMENT C – BEST MANAGEMENT PRACTICES (BMPS)
WATER QUALITY ORDER NO. 2009-0006-DWQ**

- P.** Repair or replace broken risers, sprinklers, valves, etc. as soon as they are discovered; replace with appropriate make and model of equipment to maintain uniformity through out the system.
- Q.** Routinely check backflow devices, pumps, etc. for leaks and repair or replace as necessary.
- R.** Routinely clean screens and backwash filters to keep systems operating optimally.

Management:

- S.** Determined the optimum duration and frequency for irrigation cycles considering evapotranspiration, soil type, plant varieties being irrigated, climatic conditions, and any other factors affecting optimum irrigation efficiencies.
- T.** Irrigation with recycled water only occurs during periods of minimal public use of the Use Area with consideration given to allow an adequate dry-out time before the Use Area will be used by the public.
- U.** The frequency of respective irrigation cycles is only as often as necessary to meet the water requirements of the landscape. This is determined by measuring the amount of moisture remaining in the root zone reservoir between irrigation cycles. Moisture levels in the root zone is measured and optimized via the use of tensiometers, gypsum blocks, soil probes, the “feel method”, an on-site weather station, and or the California Irrigation Management Information System (CIMIS) to estimate soil moisture levels. These methods are reviewed, inspected, and maintained regularly to ensure accuracy and reliability.
- V.** Use automatic rain shut-off devices to reduce irrigation if significant rainfall occurs.
- W.** Use multiple rain shut-off devices to reduce ponding if precipitation rate is higher than the infiltration rate of the soil.
- X.** Majority of irrigation occurs in the evening or early morning to avoid the heat and/or windy parts of the day.
- Y.** Irrigated areas grouped into zones of similar water use.
- Z.** As needed, aerate the soil to improve infiltration of air and water into the soil.
- AA.** Perform good horticultural practices; fertilization, mowing, de-thatching, aeration, and pest control, as necessary to create the best growing environment for landscape vegetation.
- BB.** Provided infiltration areas at the lowest elevation of the Use Area.
- CC.** Installed storm drain inlet valves or plugs to contain accidental discharges during dry weather
- DD.** Implemented low impact development practices to minimize runoff that contains recycled water.
- EE.** Employ water budgeting using evapotranspiration data from CIMIS or an on-site weather station and crop coefficients from Water Use Classification of Landscape Species (WUCOLS)
- FF.** Dedicated landscape water meters for monitoring of water budget and leak detection.
- GG.** Conformance to local or the State Water Efficient Landscape Ordinance.
- HH.** Education of residents, customers and employees regarding the importance of efficient water use.
- II.** Each site supervisor has been provided a conductivity tester as a tool to help them determine the difference between recycled water and potable water.

ATTACHMENT D
RECYCLED WATER USE SIGNAGE
FOR
WATER QUALITY ORDER NO. 2009-0006-DWQ
GENERAL PERMIT FOR
LANDSCAPE IRRIGATION USES OF MUNICIPAL RECYCLED WATER



D-1

ATTACHMENT E - NOTICE OF TERMINATION

OF COVERAGE PURSUANT TO WATER QUALITY ORDER NO. 2009-0006-DWQ

**GENERAL PERMIT FOR
LANDSCAPE IRRIGATION USES OF MUNICIPAL RECYCLED WATER**

I. Reason for Termination (Required):

<input type="checkbox"/> Cessation of Recycled Water Use <input type="checkbox"/> Recycled Water not treated to required standards <input type="checkbox"/> Change of Ownership <input type="checkbox"/> Other: _____	
Notice of Applicability Order No. 2009-0006-DWQ Date Issued: _____	WDID: _____

II. Producer (Required)¹:

Agency / Organization / Name:	
Facility:	
Order Number:	Facility WDID:

III. Distributor (Required)²:

Agency / Organization / Name:	
Facility:	

IV. Certification (Required)³:

<p><i>I certify under penalty of law that all authorizations for uses of recycled water, have been eliminated or that I am no longer the Producer or Distributor of recycled water as defined in the Notice of Applicability identified in Section I. I understand that by submitting this Notice of Termination I am no longer authorized to produce or distribute recycled water pursuant to the Notice of Applicability identified in Section I. I also understand that submittal of this Notice of Termination does not release any of the subject entities from liability for any violations of, Water Quality Order No. 2009-0006-DWQ or the California Water Code, or the California Code of Regulations.</i></p>		
I.	Signature of Producer :	Title:
	Printed or Typed Name:	Date:
II.	Signature of Distributor :	Title:
	Printed or Typed Name:	Date:

¹ Attach multiple sheets if necessary.

² Attach multiple sheets if necessary.

³ Attach multiple sheets if necessary.

**ATTACHMENT F – BASIN/SUB-BASIN
ANNUAL REPORTING FORMAT**

WATER QUALITY ORDER NO. 2009-0006-DWQ

**GENERAL PERMIT FOR
LANDSCAPE IRRIGATION USES OF MUNICIPAL RECYCLED WATER**

I. Administrator:

Agency / Organization:				
Facility:				
Landscape Irrigation General Permit Number:		Landscape Irrigation General Permit WDID:		
Mailing Address:				
City:	County:	State :	Zip:	Phone Number:
Contact Person:		E-Mail:		
Any CDPH Approved Amendments to the Title 22 Engineering Report? <input type="checkbox"/> Yes <input type="checkbox"/> No				

II. Recycled Water Distributor Information¹:

Agency / Organization:				
Facility:				
Landscape Irrigation General Permit Number:		Landscape Irrigation General Permit WDID:		
Distributor Recycled Water Conveyance Role (Check all that apply): <input type="checkbox"/> Recycled Water Retailer <input type="checkbox"/> Recycled Water Wholesaler <input type="checkbox"/> Recycled Water Supplier				
Description of Recycled Water Conveyance Role:				
Mailing Address:				
City:	County:	State :	Zip:	Phone Number:
Contact Person:		E-Mail:		

¹ Attach multiple sheets if necessary.

**ATTACHMENT F – BASIN/SUB-BASIN
ANNUAL REPORTING FORMAT
WATER QUALITY ORDER NO. 2009-0006-DWQ**

V. Recycled Water Use Supervisor:

Agency / Organization / Name:			
Mailing Address:			
City:	County:	State:	Zip
Phone Number:		Fax Number:	
Contact Person:		E-Mail:	
Date of most recent training / certification as Recycled Water Use Supervisor:		Training / certification provided by:	

VI. Annual Recycled Water Report for the Basin / Sub-basin

Month	Volume of Recycled Water (Ac-ft.)	Total Number of Use Areas / basin	Area of Application (Acres)	Nitrogen Application Rate (lbs/Acre/Month)	Salinity Application Rate (lbs/Acre/Month)
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					
Annual Average¹:					
Total:					

¹ Mean average value for the calendar year.

**ATTACHMENT F – BASIN/SUB-BASIN
ANNUAL REPORTING FORMAT
WATER QUALITY ORDER NO. 2009-0006-DWQ**

OTHER DOCUMENTATION

<p>Describe approved amendments to the approved Title 22 Engineering Report. Include copies of approval letter(s) prepared by CDPH regarding such amendments to the Title 22 Engineering Report if any.</p>			
<p>Provide a description of new use sites approved by CDPH. The description shall include information necessary for the CDPH to evaluate new use sites pursuant to the Title 22 Requirements. Examples of necessary information may include location of backflow prevention devices, drinking fountains, groundwater wells, et cetera.</p>			
<p>Describe the nature, extent, and cause of any exceedances of turbidity or disinfection standards, if any. Discuss corrective actions taken or planned to resolve the exceedances of turbidity or disinfection standards</p>			
<p>PERIODIC INSPECTION OF RECYCLED WATER USE AREA</p>			
<p>Cross-connection Prevention</p>			
<p>Recycled Water Use Area Name</p>	<p>Date of Inspection(s) for cross-connection prevention:</p>	<p>Description of violations identified, if any:</p>	<p>Actions taken or planned for correcting violations:</p>
<p>Agronomic Rate Evaluation</p>			
<p>Average Agronomic Demand (lbs/acre/year)</p>		<p>Average Nitrogen application (lbs/acre/year)</p>	
<p>Corrective actions taken to ensure recycled water use occurs at reasonable agronomic rates</p>			

APPENDIX: E

ATTACHMENT B - NOTICE OF INTENT (NOI)

FOR COVERAGE PURSUANT TO WATER QUALITY ORDER NO. 2009-0006-DWQ

**GENERAL PERMIT FOR
LANDSCAPE IRRIGATION USES OF MUNICIPAL RECYCLED WATER**

I. Distributor (Required)¹:

Agency / Organization / Name:			
Facility, if any:			
Conveyance Role (Check all that apply): <input type="checkbox"/> Recycled Water Retailer <input type="checkbox"/> Recycled Water Supplier <input type="checkbox"/> Recycled Water Wholesaler		Distributor declares responsibility for administering program necessary to fulfill the requirements of this General Permit: <input type="checkbox"/> Yes <input type="checkbox"/> No	
Description of Recycled Water Conveyance Role:			
Existing Water Reclamation Requirements (if any):		Do you request to rescind the identified existing WRRs? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Mailing Address:			
City:	County:	State:	Zip:
Phone Number:		Fax Number:	
Contact Person:		E-Mail:	

II. Producer (Required)¹:

Agency / Organization:			
Facility:			
Producer declares responsibility for administering program necessary to fulfill the requirements of this General Permit: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Order Number:	WDID:	Treatment: <input type="checkbox"/> Disinfected Tertiary ² <input type="checkbox"/> Advanced ³	
Existing Water Reclamation Requirements (if any):		Do you request to rescind the identified existing WRRs? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Mailing Address:			
City:	County:	State:	Zip:
Phone Number:		Fax Number:	
Contact Person:		E-Mail:	

¹ Attach multiple sheets if necessary; only one administrator of this General Permit is allowed per NOI.

² As defined in California Code of Regulations Title 22, sections 60301.230 and 60301.320

³ Achieves "disinfected tertiary" quality and includes additional treatment.

**ATTACHMENT B – NOTICE OF INTENT (NOI)
WATER QUALITY ORDER NO. 2009-006-DWQ**

III. Billing Address (Required):

Agency / Organization / Name:			
Mailing Address:			
City:	County:	State:	Zip:
Phone Number:		Fax Number:	
Contact Person:		E-Mail:	

IV. Salt and Nutrient Management Plans (required)

For projects where Salt and Nutrient Management Plan is in effect.	
<p>Salt and Nutrient Management Plan, approved by a Regional Water Board?</p> <input type="checkbox"/> Yes <input type="checkbox"/> No; check one of the two boxes below: <ul style="list-style-type: none"> <input type="checkbox"/> Under development, estimated completion date: I am actively participating in this development effort. <input type="checkbox"/> No organized effort to develop a Salt and Nutrient Management Plan for the basin exists at this time. I will actively participate in the development of a Salt and Nutrient Management Plan when the effort commences. 	
For projects where Salt and Nutrient Management Plan is not in effect.	
Antidegradation analysis completed consistent with Recycled Water Policy Paragraph 9d.(2)? <input type="checkbox"/> Yes <input type="checkbox"/> No	

V. Certification (Required):

<p><i>I hereby agree to meet and follow the requirements set forth in Water Quality Order No. 2009-0006-DWQ. I also agree to adhere to the Operation & Maintenance Plan, submitted herewith, and to ensure the proper use of recycled water for landscape applications. I also agree that, where an applicable Salt and Nutrient Management Plan is adopted by a Regional Water Board, I will ensure full compliance by all producers and distributors under this permit to any monitoring and reporting elements therein. Upon approval of coverage under the General Permit I will assume responsibility for administering an appropriate program necessary to fulfill the requirements of Water Quality Order No. 2009-0006-DWQ. I declare under the penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment.</i></p>					
I.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">Signature of Administrator:</td> <td>Title:</td> </tr> <tr> <td>Printed or Typed Name:</td> <td>Date:</td> </tr> </table>	Signature of Administrator:	Title:	Printed or Typed Name:	Date:
Signature of Administrator:	Title:				
Printed or Typed Name:	Date:				

**ATTACHMENT B – NOTICE OF INTENT (NOI)
WATER QUALITY ORDER NO. 2009-006-DWQ**

I hereby agree to meet and follow the requirements set forth in Water Quality Order No. 2009-0006-DWQ. I also agree to adhere to the Operation & Maintenance Plan, submitted herewith, and to ensure the proper use of recycled water for landscape applications. I declare under the penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment.

I.	Signature of Distributor ^{4,5} :	Title:
	Printed or Typed Name:	Date:
II.	Signature of Producer ⁶ :	Title:
	Printed or Typed Name:	Date:

⁴ For additional distributors other than the Administrative Distributor.

⁵ Attach multiple sheets if necessary.

⁶ Attach multiple sheets if necessary.

MAYOR
Miguel A. Pulido
MAYOR PRO TEM
Michele Martinez
COUNCILMEMBERS
P. David Benavides
Vicente Sarmiento
Jose Solorio
Sal Tinajero
Juan Villegas



INTERIM CITY MANAGER
Cynthia J. Kurtz
CITY ATTORNEY
Sonia R. Carvalho
CLERK OF THE COUNCIL
Maria D. Huizar

CITY OF SANTA ANA

220 S. Daisy Ave., M-85
Santa Ana, California 92703
714-647-3320
www.santa-ana.org

August 29, 2017

Orange County Water District
Attn: Benjamin Smith
18700 Ward St.
Fountain Valley, CA 92728

SUBJECT: Green Acres Project Agreement

Dear Mr. Smith:

Please find enclosed an original document for the agreement between Orange County Water District and City of Santa Ana regarding the distribution and sale of Green Acres Project water. Any questions regarding this agreement should be directed to Brian Ige at (714) 647-3385.

Sincerely,

A handwritten signature in blue ink, appearing to read "Brian Ige".

Brian Ige,
Assistant Engineer II

Enclosure: Agreement

SANTA ANA CITY COUNCIL

Miguel A. Pulido
Mayor
mpulido@santa-ana.org

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INSURANCE NOT ON FILE
WORK MAY NOT PROCEED

CLERK OF COUNCIL

DATE: AUG 22 2017

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AGREEMENT BETWEEN ORANGE COUNTY WATER DISTRICT AND
CITY OF SANTA ANA REGARDING
DISTRIBUTION AND SALE OF GREEN ACRES PROJECT WATER

[Handwritten initials]
O: PWA (2)
Ruby Rosas

THIS AGREEMENT ("Agreement"), is made and entered into as of July 1, 2017, by and between the ORANGE COUNTY WATER DISTRICT, a special governmental district (hereinafter "OCWD") and the CITY OF SANTA ANA, a charter city and municipal corporation organized and existing under the laws of the State of California (hereinafter "RETAILER").

RECITALS

A. OCWD was created by the OCWD Act, Ch. 924, Stats. 1933, as amended, for the purpose of protecting and managing the Orange County groundwater basin. The OCWD Act empowers OCWD to manage the groundwater basin, to provide for the conservation of the quantity and quality of water in the groundwater basin, to conserve and reclaim water within or outside of the boundaries of OCWD, to sell or otherwise put to beneficial use any water or reclaimed wastewater in order to conserve groundwater resources, and to distribute water to persons in exchange for ceasing or reducing the extraction of groundwater from the groundwater basin.

B. OCWD purchases imported water from the Metropolitan Water District of Southern California (hereinafter "MWD"), through its member public agencies, for spreading and replenishment purposes, and obtains wastewater from the Orange County Sanitation District (hereinafter "OCSD") for renovation-reclamation, spreading and replenishment purposes, and groundwater injection.

C. A portion of the reclaimed wastewater currently produced by OCWD is suitable for a number of non-potable uses, including but not limited to, landscape irrigation and industrial uses.

D. RETAILER is a municipal corporation and charter city organized and existing pursuant to the laws of the State of California. RETAILER is the exclusive retail water purveyor, including water for residential, industrial, commercial, public agency, agricultural and other uses, within RETAILER's boundaries. RETAILER currently distributes potable water in part purchased from the MWD and in part produced from groundwater within its boundaries. The corporate and water service boundaries of RETAILER are within the jurisdictional boundaries of OCWD.

E. Landscape irrigation and industrial water users within the jurisdictional and service boundaries of RETAILER currently either purchase potable or non-potable water from RETAILER for their use, or produce water from the groundwater basin by means of their own facilities for their use, which private groundwater production is under the jurisdiction and control of OCWD.

F. In 1991, OCWD began operating a water treatment facility, transmission mains and distribution pipeline system (including mainlines and service lines) and, in some cases, on-site plumbing, known as the "Green Acres Project", for the purpose of reclaiming wastewater received from OCSD (hereinafter, "Project Water") and distributing the Project Water for appropriate landscape irrigation and industrial purposes in order to supplement and conserve the supply of potable groundwater available to the residents and water users within the boundaries of OCWD. OCWD entered into agreements with retail water providers within OCWD's boundaries, including RETAILER, for the distribution and sale of Project Water within the respective boundaries of RETAILER and the other retail water agencies contracting with OCWD for Project Water. OCWD has operated the Green Acres Project continually since 1991; and during that period, RETAILER has continually purchased Project Water for resale to certain customers for landscape irrigation and/or industrial uses. OCWD and RETAILER desire to continue use of the Green Acres Project and its associate Project Water. A plat map depicting the location of the facilities comprising the Green Acres Project which OCWD currently operates and maintains is set forth as Exhibit A hereto.

G. OCWD and RETAILER mutually acknowledge that the use of reclaimed water for landscape irrigation is of mutual benefit to OCWD and RETAILER in fulfilling their joint responsibilities for the conservation of water resources in accordance with Sections 13550 and 13551 of the California Water Code.

H. OCWD and RETAILER mutually desire to terminate their existing Project Water agreement and enter into a new agreement to set forth the terms and conditions under which OCWD will continue to sell Project Water to RETAILER for resale by RETAILER to appropriate landscape irrigation and industrial water users within the service boundaries of RETAILER, and under which RETAILER will continue to purchase Project Water from OCWD for such resale purposes.

AGREEMENTS

NOW, THEREFORE, in consideration of the facts recited above and the terms, covenants and conditions herein contained, the parties hereto agree as follows:

SECTION ONE: TERMINATION OF PREVIOUS AGREEMENT

1.1 OCWD and RETAILER mutually agree that the written agreement entered into between OCWD and RETAILER, entitled "AGREEMENT BETWEEN ORANGE COUNTY WATER DISTRICT AND CITY OF SANTA ANA REGARDING DISTRIBUTION AND SALE OF GREEN ACRES PROJECT WATER" and dated September 21, 1988, relating to the construction of the Project Facilities and the sale of Project Water by OCWD to RETAILER for resale to RETAILER's Project Customers, is hereby terminated as of the effective date of this Agreement and superseded by this Agreement.

SECTION TWO: FACILITIES FOR DELIVERY AND DISTRIBUTION OF PROJECT WATER

2.1 The parties acknowledge that OCWD has constructed, operates, owns, and maintains, the Green Acres Project, and all facilities to produce, transport and distribute Project Water for the herein specified purposes (hereinafter, the "Project Facilities"). A plat map depicting that portion of the Project Facilities which OCWD constructed, operates and maintains within the boundaries of RETAILER is attached hereto as Exhibit B.

2.2 The constructed Project Facilities include a distribution pipeline system from the site of the Green Acres Project Water Treatment Facility, located at 18700 Ward Street, Fountain Valley, California, to the point of connection to each of the proposed Project Water customers within the boundaries of RETAILER (hereinafter, "Project Customers"), for the purpose of distributing Project Water to RETAILER at the points of connection of the Project Customers for purchase by RETAILER and resale to the Project Customers. The names and anticipated annual Project Water demands of each existing and currently allowed new Project Customer are set forth in Exhibit C.

2.3 The parties acknowledge that the Project Facilities are owned by OCWD, and OCWD shall perform maintenance, emergency response, repair and replacement of the Project Facilities located within the boundaries of RETAILER. RETAILER may perform, on behalf of OCWD, maintenance, emergency response, repair and replacement of the Project Facilities located within the boundaries of RETAILER, pursuant to paragraph 5.1 herein below and arranged in writing prior to any such activity. In this regard:

- 2.3.1 The parties agree to restore, or cause Project Customer to restore, roads, streets, alleys, avenues, highways, drainage facilities, or any other public way or property used for construction, operations, or maintenance of the Project Facilities within RETAILER's boundaries to at least the same condition existing prior to construction, operation or maintenance of the Project Facilities, to the reasonable satisfaction of RETAILER and OCWD.
- 2.3.2 The parties agree to provide, or cause Project Customer to provide, adequate safeguards to afford security to life and property during construction, operation, and maintenance of the Project Facilities, with due regard being given to other existing uses of public roads, streets, alleys, avenues, highways, drainage facilities, public ways and property within the boundaries of RETAILER.
- 2.3.3 The parties agree to use, or cause Project Customer to use, its best efforts to minimize noise, dust, pollution and problems relating to police and fire protection within the boundaries of RETAILER throughout construction, operation and maintenance of the Project Facilities within RETAILER's boundaries.

2.3.4 The parties understand and agree that OCWD's rights to construct, maintain, operate, inspect, repair and replace the Project Facilities within the lands and rights-of-way of RETAILER do not constitute vested property rights and are expressly subject to and governed solely by this Agreement.

2.4 The parties acknowledge that RETAILER has, at no cost to OCWD, provided metering devices meeting RETAILER's specifications, and that these metering devices are owned, operated and maintained by RETAILER for the purpose of measuring the quantity of Project Water purchased by RETAILER and resold by RETAILER to each Project Customer. In the event that OCWD and RETAILER determine to expand the Green Acres Project to serve one or more new Project Customers, RETAILER shall provide a metering device for each new Project Customer, and shall own, operate and maintain it at no cost to OCWD. RETAILER shall be responsible for ensuring the accuracy of all metering devices used to measure the quantity of Project Water delivered to each existing or new Project Customer. Any costs incurred in modifying the size of existing RETAILER meters shall be the responsibility of RETAILER; provided, however, that RETAILER has the discretion to delegate that duty to a Project Customer, so long as RETAILER remains ultimately responsible to OCWD for the accuracy of the metering device. The quantity of Project Water measured by the meters to be owned, operated and maintained by RETAILER shall be the sole basis for determining the quantity of Project Water delivered to Project Customer under Section Three of this Agreement. In the event that a meter measuring the quantity of Project Water delivered by RETAILER for resale to a Project Customer indicates a lesser quantity than OCWD's meter measuring the quantity of Project Water delivered to RETAILER for resale to a Project Customer, OCWD shall be responsible for the cost of such difference, and RETAILER shall not be liable therefor. In the event RETAILER has a separate metering device serving exclusively non-potable uses on the premises of a Project Customer, OCWD may sell Project Water to RETAILER by connecting the Project Facilities distribution pipeline system directly to the separate non-potable meter so long as the standards and requirements of RETAILER and any other governmental agency having jurisdiction over the quality of Project Water are satisfied.

2.5 RETAILER shall implement and maintain measures to avoid the risk that Project Water may enter into RETAILER's potable water distribution system at no cost to OCWD. The parties acknowledge that the non-potable Project Water system has been marked with separate marking in accordance with standards and regulations in existence when the Project Water system was constructed, and that any extensions of the Project Water system shall be separately marked as required by law.

2.6 The Project Water distribution pipeline system has been constructed by OCWD with sufficient capacity to allow RETAILER to serve the landscape irrigation and industrial water users participating as Project Customers as shown in Exhibit C. OCWD shall sell to RETAILER, and RETAILER shall purchase from OCWD, sufficient quantities of Project Water for RETAILER to sell to those Project Customers. OCWD and RETAILER mutually understand

and agree that additional non-potable water users within the boundaries of RETAILER may at some future time be served with Project Water and become Project Customers without the necessity of amending this Agreement, provided that a water user within the service boundaries of RETAILER shall become a new Project Customer only with the approval of both OCWD and RETAILER; and provided further, that OCWD shall have the sole discretion to determine whether to expand the Project Facilities or the production and distribution capacity of the Project Facilities to meet any future demand for Project Water that may be generated within the boundaries of RETAILER. All future water users within the service boundaries of RETAILER who become Project Customers shall be subject to the Project Rules as defined in paragraph 6.2 and adopted by RETAILER pursuant to paragraph 6.3 herein below.

2.7 The addition of infrastructure to serve future Project Customers shall be approved by OCWD, RETAILER, and pertinent regulatory agencies. Additional infrastructure may include service laterals, mainline pipelines, pump stations, vaults, meters, and other components. Unless authorized in writing by OCWD, the permitting, design, construction, inspection, specialty inspection and materials testing, start-up, on-going regulatory compliance, and those costs described in Paragraph 2.3 shall be performed at no expense to OCWD. The OCWD staff time for review of the design, construction inspection of the additional infrastructure, and assistance in regulatory permitting shall be included in the annual Project Water costs set forth in paragraph 3.2 as components of the Project Water rate charged by OCWD to RETAILER, unless otherwise stipulated in writing by OCWD. OCWD shall cause the Project Facilities within the boundaries of RETAILER to be constructed in accordance with the construction standards of RETAILER. Addition of infrastructure located within public right-of-way and upstream of the RETAILER meters described in paragraph 2.4 shall become the property of OCWD after written construction acceptance by OCWD, RETAILER, and any other pertinent agency. Additional infrastructure within private property shall not be owned by OCWD, unless authorized in writing by OCWD and pursuant to an easement granted from the land owner to RETAILER and/or OCWD. Unless authorized in writing by OCWD, new RETAILER meters shall be located in the public right-of-way. The regulatory permitting and/or approvals of any future Project Customer site shall be obtained prior to delivery of Project Water to that site. RETAILER shall lead the effort to obtain these permits and/or approvals and OCWD shall assist and coordinate with the RETAILER.

2.8 Major expansions to the Project Water distribution system may be performed under a different ownership-maintenance model than described in Section 2 if mutually approved and defined in writing by OCWD and RETAILER.

SECTION THREE: PURCHASE AND SALE OF PROJECT WATER

3.1 RETAILER shall have the exclusive right to purchase Project Water from OCWD, at the point of connection to each Project Customer, and to resell Project Water to the Project Customers shown in Exhibit C, and such other landscape irrigation and industrial water

users within the boundaries of RETAILER that may be added as Project Customers in accordance with paragraphs 2.6, 2.7 and 2.8 above.

3.2 RETAILER shall purchase the Project Water from OCWD, at the point of its metered connections, for an amount equal to OCWD's cost of producing and distributing Project Water based on the methodology set forth in Exhibit D, as determined by OCWD after consultation with the Operating Group defined in paragraph 3.3. Capital improvements such as changes in treatment plant technology and distribution system operation shall be included in OCWD's costs. OCWD shall annually calculate the Project Water rate, and provide written notice to RETAILER of the then-effective Project Water rate. Upon request, OCWD shall provide RETAILER with supporting data used to calculate the Project Water rate. OCWD shall have discretion to smooth out anticipated increases in debt and capital improvement payments over several years preceding and following actual OCWD cost incurrence years, in order to avoid significant and sudden increases to the Project Water rate. When a smoothing method is applied by OCWD, it will be discussed with the Operating Group, as defined in paragraph 3.3, and disclosed on the annual revision of Exhibit D. The point of connection and sale of the Project Water from OCWD to RETAILER shall be at the meter which measures the flow of Project Water to each Project Customer, as described in paragraph 2.4 herein above. The parties mutually recognize and agree that the Project Water rate may change each year and become effective on July 1 of each year during the term of this Agreement.

3.3 Staff representatives of OCWD, RETAILER, and other retail agencies participating in the Green Acres Project shall form an "Operating Group" to meet at least once prior to the annual publishing of the revised Exhibit D by OCWD. The Operating Group shall meet and confer with regard to the proposed Exhibit D contents, future Exhibit D estimates, planned Green Acres Project capital and repair projects, and review previous Green Acres Project projects, Project Water performance, and revisions to Exhibit E.

3.4 The governing body of RETAILER shall establish the rate for the resale of Project Water to each Project Customer in accordance with applicable legal requirements which may include cost of service.

3.5 RETAILER shall read the Project Water meter for each Project Customer on a one (1) month cycle or in concurrence with RETAILER's schedule for reading meters which measure the quantity of potable water delivered by RETAILER. Within fifteen (15) days thereafter, RETAILER shall transmit to OCWD a statement setting forth the Project Water rate established by RETAILER pursuant to paragraph 3.4 during that billing period, a description of the maintenance, repair and replacement activities of RETAILER on Project Facilities, the amount of such actual costs incurred by RETAILER pursuant to paragraph 5.1 herein below during that billing period, and indicating, for each Project Customer, the current meter reading, the previous meter reading, and the total quantity of Project Water purchased from OCWD and resold by RETAILER to such Project Customer during the billing period. Together with this statement, RETAILER shall transmit to OCWD payment in accordance with paragraph 3.2 for the Project Water purchased from OCWD by RETAILER and resold by RETAILER to all of the

Project Customers during the billing period, after deducting therefrom the actual costs incurred by RETAILER in maintaining, repairing and replacing the Project Water distribution system within RETAILER's boundaries as set forth in paragraph 5.1 herein below.

SECTION FOUR: PROJECT WATER QUALITY REGULATIONS

4.1 OCWD shall deliver and sell to RETAILER pursuant to this Agreement Project Water that conforms to all current and future requirements established by the California Regional Water Quality Control Board – Santa Ana Region, California State Water Resources Control Board Division of Drinking Water, County of Orange Health Care Agency, and all other federal, state and local agencies having jurisdiction to fix minimum standards. The anticipated quality of Project Water is shown on Exhibit E attached hereto and incorporated herein, and this Exhibit E shall subsequently be revised to conform to any future regulatory requirements; provided however, that OCWD shall not have obligation to modify the quality of Project Water to meet the needs of any particular Project Customer. OCWD shall revise Exhibit E if and when OCWD modifies the tertiary treatment technology, disinfection process, and/or introduces OCSD Plant #2 effluent to the GAP treatment process, and provide written notice of such revised Exhibit E to RETAILER. The parties acknowledge that Exhibit E can be revised by OCWD without amending this Agreement after such revision's discussion at the Operating Group. OCWD shall strive to meet or exceed the minimum criteria stated in Exhibit E.

4.2 During the term of this Agreement, OCWD shall pay all costs imposed by any and all governmental agencies having jurisdiction over the quality or use of Project Water for the issuance of any permits, licenses or approvals required for the production treatment, distribution or sale of Project Water. If incurred by OCWD, the costs described in this paragraph shall be included in the annual Project costs set forth in paragraph 3.2 as components of the Project Water rate charged by OCWD to RETAILER.

4.3 OCWD shall inform RETAILER promptly after becoming aware of any proposed or actual modifications by any agency having jurisdiction over the quality of Project Water to any requirements governing the minimum standards of quality for or use of Project Water, or of any changes in the legally permissible uses which might affect the use of the Project Water sold by OCWD to RETAILER for resale by RETAILER to Project Customers, and OCWD shall bear all costs of conforming to any such future requirements. If incurred by OCWD, the costs described in this paragraph shall be included in the annual Project costs set forth in paragraph 3.2 as components of the Project Water rate charged by OCWD to RETAILER.

4.4 RETAILER shall perform Project Customer inspection and testing in accordance with the Project Rules defined in paragraph 6.2, prepared by OCWD and transmitted to RETAILER who may make additions, as amended from time to time by OCWD, and provide a written record of such activities to OCWD within sixty (60) days of their performance. Expenses for these activities shall not be reimbursed by OCWD.

SECTION FIVE: OPERATING OBLIGATIONS OF THE PARTIES

5.1 During the term of this Agreement, OCWD shall manage, operate and maintain the Project Facilities in an efficient manner and in accordance with the highest standards of skill and workmanship; provided, however, that OCWD may contract with RETAILER for the performance by RETAILER of the actual maintenance, repair and replacement responsibilities with respect to those Project Facilities located within the service boundaries of RETAILER. RETAILER recognizes the special quality considerations relating to Project Water, and RETAILER shall perform its maintenance, repair and replacement responsibilities in an efficient manner and in accordance with the highest standards of skill and workmanship. OCWD retains the right to make repairs to Project Facilities within the service boundaries of RETAILER. RETAILER shall receive as a credit against all monies due OCWD, pursuant to paragraph 3.2 herein above for the sale of Project Water, the cost of such maintenance, repair and replacement activities actually undertaken by or on behalf of RETAILER, which costs shall include the actual labor, material and equipment costs, plus overhead costs incurred by RETAILER and necessary for such maintenance, repair and replacement activities.

5.2 Notwithstanding the provisions of paragraph 5.1, the operating responsibility of OCWD with respect to the Project Facilities shall include the maintenance of quality, quantity and pressure of the Project Water, and compliance with all regulatory requirements and conditions applicable to the distribution and sale of Project Water, to the point of connection to each Project Customer.

5.3 RETAILER shall, at no cost to OCWD, assume ownership, service, maintenance and reading of the Project Water meter and valve set and meter box/vault for each Project Customer in the same manner that RETAILER would for a customer service meter attached to its potable water system. RETAILER further shall, at no cost to OCWD, be responsible for customer service functions relating to all Project Customers, including but not limited to billing and collection of payments from Project Customers for the Project Water, record keeping, and notification to OCWD of the quantity of Project Water delivered through each Project Customer's meter during each meter reading period.

5.4 OCWD shall have the right to review the books, records and accounts maintained by RETAILER relating to the Project water and Project Customers during normal business hours, upon forty-eight (48) hours prior written notice to RETAILER.

5.5 OCWD shall operate the Project Facilities in such a manner that Project Water shall be delivered to the point of connection to each Project Customer on a continuous basis at a pressure of not less than fifty (50) pounds per square inch. RETAILER shall assist OCWD in achieving this pressure criterion by staggering Project Customer demand timeframes as needed. OCWD shall strive to have a pressure greater than one hundred (100) pounds per square inch entering the Project Facilities from the Water Treatment Facility. If OCWD's analysis of future Project Customer sites indicates this pressure criteria cannot be met by the existing Project

Facilities, OCWD shall declare by written notice to RETAILER that this standard of service will not apply to these future Project Customers.

5.6 Except as provided in paragraph 9.6 below, in the event that, at any time during the term of this Agreement, OCWD for any reason cannot or chooses not to produce Project Water from its Green Acres Project Water Treatment Facility described in paragraphs 2.1 and 2.2 above, OCWD shall provide through the Project Facilities, or otherwise, at a cost equal to the cost of Project Water, sufficient water of a quality at least equal to the quality of Project Water to meet the landscape irrigation and industrial water needs of all of the Project Customers. OCWD, however, shall have no such obligation in the event that Project Water cannot be delivered to Project Customers due to damage to, breaks, or other disruptions in the distribution facilities transporting Project Water to Project Customers, including maintenance and additions to Project Facilities. OCWD shall strive to restore Project Water delivery within 72 hours of disruptions. With respect to non-emergency maintenance, repair, and construction work, OCWD shall coordinate such interruptions with RETAILER at least thirty (30) days in advance.

5.7 If the State of California proclaims a drought “State of Emergency” and restricts the use of potable water supplies, RETAILER will attempt to reduce the use of recycled water consistent with the RETAILER’s conservation standards mandated by the State. Notwithstanding the RETAILER’s existing regulations, RETAILER’s governing body shall consider enacting permanent mandatory water conservation requirements for recycled water use and any additional restrictions during periods of water supply shortages.

SECTION SIX: PROJECT WATER RULES AND REGULATIONS

6.1 All Project Water produced by OCWD for delivery and sale to RETAILER shall be in accordance with the terms and conditions of the discharge requirements and primary user permit for the Project Water issued to OCWD by the California Regional Water Quality Control Board – Santa Ana Region. OCWD has obtained and shall maintain a blanket primary user permit for the production, distribution and sale of Project Water, and shall at all times maintain and comply with all present and future provisions thereof and all renewals or subsequent such permits.

6.2 The parties acknowledge that OCWD has promulgated, and the parties agree that OCWD and RETAILER shall enforce rules and regulations regarding the distribution, delivery and sale of Project Water to RETAILER, and governing the use of Project Water resold by RETAILER to Project Customers (“Project Rules”). OCWD shall maintain approvals from all federal, state, and local agencies having jurisdiction over the production, quality and use of Project Water, including, but not limited to, the California Regional Water Quality Control Board – Santa Ana Region, California State Water Resources Control Board Division of Drinking Water, and County of Orange Health Care Agency, that such Project Rules comply with the regulations, requirements and orders of such regulatory agencies.

6.3 The parties acknowledge that OCWD has heretofore prepared and transmitted to RETAILER the Project Rules, and that RETAILER has itself adopted the Project Rules and incorporated them into RETAILER's promulgated rules and regulations governing the distribution, delivery and sale of water within the service boundaries of RETAILER. Promptly upon adoption of RETAILER's revised promulgated rules and regulations, RETAILER shall transmit to OCWD RETAILER's adopted Project Rules. Should OCWD choose either to make reasonable amendments or modifications to the Project Rules not contrary to this Agreement, or be required by any governmental agency exercising jurisdiction over the distribution, sale or use of the Project Water to modify or amend the Project Rules, OCWD shall promptly furnish such modifications or amendments to RETAILER; and RETAILER, after being provided a ninety (90) day period in which to review, comment upon, and/or meet and confer with OCWD regarding such proposed modifications or amendments, shall incorporate such proposed modifications or amendments into RETAILER's adopted rules and regulations. Project Rules may be revised by OCWD without amendment to this Agreement. The parties acknowledge that OCWD and RETAILER have participated in a group of Orange County agencies to standardize procedures, inspection, testing, and submission requirements for applications seeking approval from regulatory authorities for new Project Customer sites and the ongoing inspection and testing of existing sites. The parties further acknowledge that upon the finalization of the Orange County standardized practices, the Project Rules will be amended to incorporate the standardized practices, which finalization is expected in 2017. RETAILER shall ensure that each Project Customer has a copy of the Project Rules and that the Project Customer adheres to the Project Rules.

6.4 RETAILER shall include in its promulgated rules and regulations provisions requiring that any current or future Project Customer permit representatives of OCWD and RETAILER to enter the premises of the Project Customer at all reasonable times for the purpose of monitoring, inspecting, analyzing and observing the Project Customer's on-site Project Water facilities and the utilization by the Project Customer of Project Water.

6.5 In connection with RETAILER's adoption of modifications or amendments to the Project Rules as part of its amended rules and regulations, and at the request of RETAILER, OCWD shall cooperate with and assist RETAILER in obtaining from the State of California Water Resources Control Board any necessary certifications, findings or orders authorized under Sections 13550 and 13551 of the California Code to require the use of Project Water for non-potable uses within the service boundaries of RETAILER.

6.6 The parties understand and agree that Project Water delivered and sold by OCWD to RETAILER pursuant to the terms of this Agreement has limited uses, and OCWD shall deliver and sell to RETAILER Project Water only for those uses and purposes which are legally permissible under the laws of the State of California and the rules, regulations and directions of the appropriate federal, state and local regulatory agencies exercising jurisdiction over the quality and use of Project Water. In this regard, OCWD and RETAILER shall cooperatively enforce Project Rules limiting the use of Project Water to legally permissible landscape irrigation

and industrial applications, and shall monitor the use of Project Water by Project Customers to safeguard against any misuse or improper application of Project Water by Project Customers.

SECTION SEVEN: INDEMNITY AND INSURANCE

7.1 OCWD shall hold RETAILER harmless from and against and shall indemnify RETAILER from any liability, loss, costs, expenses or damages however by reason of any injury (whether to body, property, or personal or business character or reputation) sustained by or to any person or property by reason of any act, neglect, default, or omission of OCWD or any of its agents, employees, or representatives, or caused by reason of the design, construction, operation or maintenance of the Project Facilities, or the distribution and sale to RETAILER for resale purposes herein of Project Water that does not meet the quality standards set forth in Title 22 of the California Administrative Code; provided, however, that OCWD shall not be responsible for the negligent operation, maintenance or repair of the Project Facilities within RETAILER'S service boundaries by RETAILER, the negligent operation, maintenance or repair by RETAILER, any Project Customer of Project Water distribution and storage facilities located on the lands of any Project Customer, and/or the misuse or misapplication of the Project Water on the Project Customer's side of the Project Water meter by any person, including RETAILER or any Project Customer. If RETAILER is sued in any court for damages by reason of any of the acts for which OCWD is required to indemnify RETAILER in this paragraph 7.1, including but not by way of limitation, damages arising out of a products liability claim, OCWD shall defend said action (or cause same to be defended) at its own expense and shall pay and discharge any and all amounts of judgement that may be rendered in any such action. If OCWD fails or neglects to so defend in said action, RETAILER may defend the same and any expenses, including reasonable attorney's fees, which it may pay or incur in defending said action and the amount of any judgement which it may be required to pay shall be promptly reimbursed upon demand. Nothing herein is intended to nor shall it relieve RETAILER or any Project Customer from liability for its own willful acts or active negligence.

7.2 OCWD shall cause RETAILER to be named as an additional insured on OCWD's general liability policy of insurance with respect to the sale and distribution to RETAILER of Project Water within the service boundaries of RETAILER, and OCWD shall provide RETAILER with certificates of insurance and endorsements evidencing such insurance coverage.

7.3 OCWD shall not commence nor permit any contractor or subcontractor to commence work or construction of any of the Project Facilities that are located within the service boundaries of RETAILER until OCWD has obtained, or has caused its contractors to obtain, comprehensive general liability insurance providing coverage for bodily injury, personal injury and property damage, and which shall include as additional insureds RETAILER, its City Council, Board Members, boards and commissions, officers, agents, vendors, and employees, but only while acting in their capacity as such and only as respects operations of the original named

insured, its subcontractors, agents, officers and employees in the performance of the construction contract. OCWD shall furnish RETAILER with certificates of insurance and endorsements showing insurance coverage as described above. RETAILER shall incur no expense in connection with obtaining and maintaining any insurance required under paragraph 7.2 and 7.3.

SECTION EIGHT: DISPUTES

8.1 In the event of any dispute arising under this Agreement, the parties hereto agree to utilize the arbitration procedure set forth in this Section Eight as the sole and exclusive means of resolving any such dispute.

8.2 Arbitration shall be initiated by any party hereto serving upon any other party a written demand for arbitration, which demand shall describe with specificity the nature of the dispute. Except as specified herein, the arbitration shall be conducted pursuant to the provisions of California Code of Civil Procedure, Section 1280, et seq. The parties hereto agree that there shall be a single neutral arbitrator who shall be a civil engineer knowledgeable in water facilities operation and reclaimed wastewater, who shall be selected in the following manner:

8.2.1 The demand for arbitration shall include a list of the names of five (5) persons acceptable to the demanding party for appointment as arbitrator. The responding party shall determine if any of the names submitted are acceptable, and, if so, shall inform the other party within ten (10) days of actual receipt of the arbitration demand, and such person will be designated as arbitrator;

8.2.2 In the event that none of the names submitted by the demanding party is acceptable to the responding party, or if for any reason the arbitrator selected is unable to serve, the responding party shall submit to the demanding party a list of the names of five (5) persons acceptable to the responding party for the appointment as arbitrator. The demanding party shall in turn have ten (10) days from actual receipt of the list in which to determine if one such person is acceptable;

8.2.3 If the parties are unable mutually to agree upon a neutral arbitrator as described above, the matter of the selection of an arbitrator, qualified as above, shall be submitted to the Orange County Superior Court pursuant to Code of Civil Procedure Section 1281.6. Upon selection of an arbitrator, the arbitration shall be conducted consistent with the provisions of Code of Civil Procedure Section 1280, et seq., as are deemed practicable by the arbitrator, considering the nature of the dispute.

8.3 The costs of arbitration, including but not limited to reasonable attorneys' fees, shall not be recoverable by the party prevailing in the arbitration, including the court costs and reasonable attorneys' fees incurred if an arbitration conducted hereunder is appealed to a court pursuant to the procedures set forth in Code of Civil Procedure Section 1280, et seq. This provision shall not relieve any party of the duty to indemnify, defend, and hold harmless the other party under this Agreement.

SECTION NINE: MISCELLANEOUS PROVISIONS

9.1 Notices: All notices, payments, transmittals of documentation and other writings required or permitted to be delivered or transmitted to any of the parties under this Agreement shall be personally served or deposited in a United States mail depository, first class postage prepaid, and addressed as follows:

If to OCWD: Orange County Water District
18700 Ward Street
P.O. Box 8300
Fountain Valley, California 92728
Attn: General Manager

If to RETAILER: City of Santa Ana
20 Civic Center Plaza
P.O. Box 1988
Santa Ana, California 92701
Attn: Clerk of the Council

With a courtesy copy to:
Director of Public Works
(same address as above)

or such other address or person as OCWD or RETAILER shall direct in writing. Service of any instrument or writing by mail shall be deemed complete forty-eight (48) hours after deposit in a United States mail depository.

9.2 Term and Amendment: The term of this Agreement shall be for thirty (30) years from the date hereof. Either party shall have the right to terminate this Agreement by written notice to the other at least three (3) years prior to the termination date. The parties must mutually agree in writing to extend the term of this Agreement. This Agreement may only be amended or modified by mutual agreement in writing of OCWD and RETAILER.

9.3 Limitation on Sales by OCWD: OCWD acknowledges and agrees that, except as provided herein or with the prior written consent of RETAILER, OCWD is not now and will not in the future become a wholesale or retail seller of Project Water within the service boundaries of RETAILER without RETAILER's written consent, and OCWD further agrees that it will not use or contract with any entity other than RETAILER for the purpose of selling and distributing Project Water within the service boundaries of RETAILER.

9.4 Basin Limitations: OCWD and RETAILER mutually understand and agree that any and all Project Water delivered and sold by OCWD hereunder shall not constitute either "supplemental sources" or "groundwater supplies" for the purpose of the annual establishment of

basin groundwater production requirements and limitations by OCWD pursuant to Section 31.5 of the OCWD Act. Project Water is hereby established as a separate class of water for the purposes of Section 31.5 of the OCWD Act.

9.6 Conditions Subsequent: The performance of this Agreement is conditioned upon OCWD's continued ability feasibly to produce and distribute Project Water for sale to RETAILER and resale by RETAILER to Project Customers in a cost-effective manner. Subsequent to the date of this Agreement, should OCWD determine in its sole discretion that unanticipated increases in the cost of producing or distributing Project Water or new or modified regulatory requirements governing the production, distribution, quality or use of Project Water render the Green Acres Project economically unfeasible, OCWD may cease production and distribution of Project Water upon ninety (90) days written notice to RETAILER. In the event that OCWD ceases the production and distribution of Project Water pursuant to this paragraph 9.6, this Agreement shall terminate and OCWD shall incur no liability to RETAILER or any Project Customer by reason of the termination of this Agreement or the termination of production and delivery of Project Water.

9.7 No Duplication of Services Intended or Created: OCWD and RETAILER mutually understand and agree that the construction and operation of the Project Facilities and the distribution and sale of Project Water by OCWD to RETAILER for sale by RETAILER to Project Customers pursuant to this Agreement do not constitute either a duplication of RETAILER's retail water service or a taking of any property of RETAILER within the meaning of Section 1501, et seq., of the California Public Utilities Code. RETAILER shall have no right to institute any action against OCWD pursuant to Sections 1503, 1504 or 1505.5 of the Public Utilities Code by reason of the construction and operation of the Project Facilities and the distribution and sale of Project Water by OCWD to RETAILER in conformance with this Agreement.

9.8 Warranty: OCWD represents and warrants that under the OCWD Act, OCWD, without the consent of any other public agency water purveyor, may enter into this Agreement to deliver and sell Project Water to RETAILER for resale by RETAILER to Project Customers or lands within the service boundaries of RETAILER.

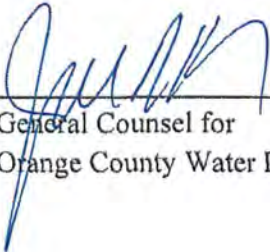
9.9 Construction: This Agreement shall be construed according to its plain meaning and as if prepared by all parties hereto. This Agreement shall be governed by and construed in accordance with the laws of the State of California.

9.10 Integration: The parties herein have set forth the whole of their agreement, and the performance of this Agreement constitutes the entire consideration intended herein.

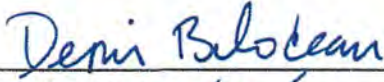
9.11 Successors: This Agreement and all of the provisions herein shall be binding upon and inure to the benefit of OCWD and RETAILER, and their respective successors and assigns.

WHEREFORE, the parties herein have executed this Agreement as of the date set forth above.

APPROVED AS TO FORM:

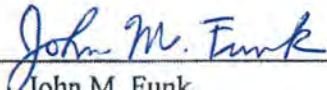
By 
General Counsel for
Orange County Water District

Orange County Water District


By 
President

By 
General Manager

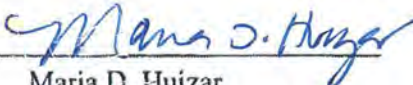
APPROVED AS TO FORM:
SONIA R. CARVALHO, CITY ATTORNEY

By 
John M. Funk,
Assistant City Attorney

CITY OF SANTA ANA

By 
Acting City Manager

ATTEST

By 
Maria D. Huizar
City Clerk

RECOMMENDED FOR APPROVAL


By 
Fred Mousavipour
Director of Public Works

Exhibit A: Green Acres Project Facilities

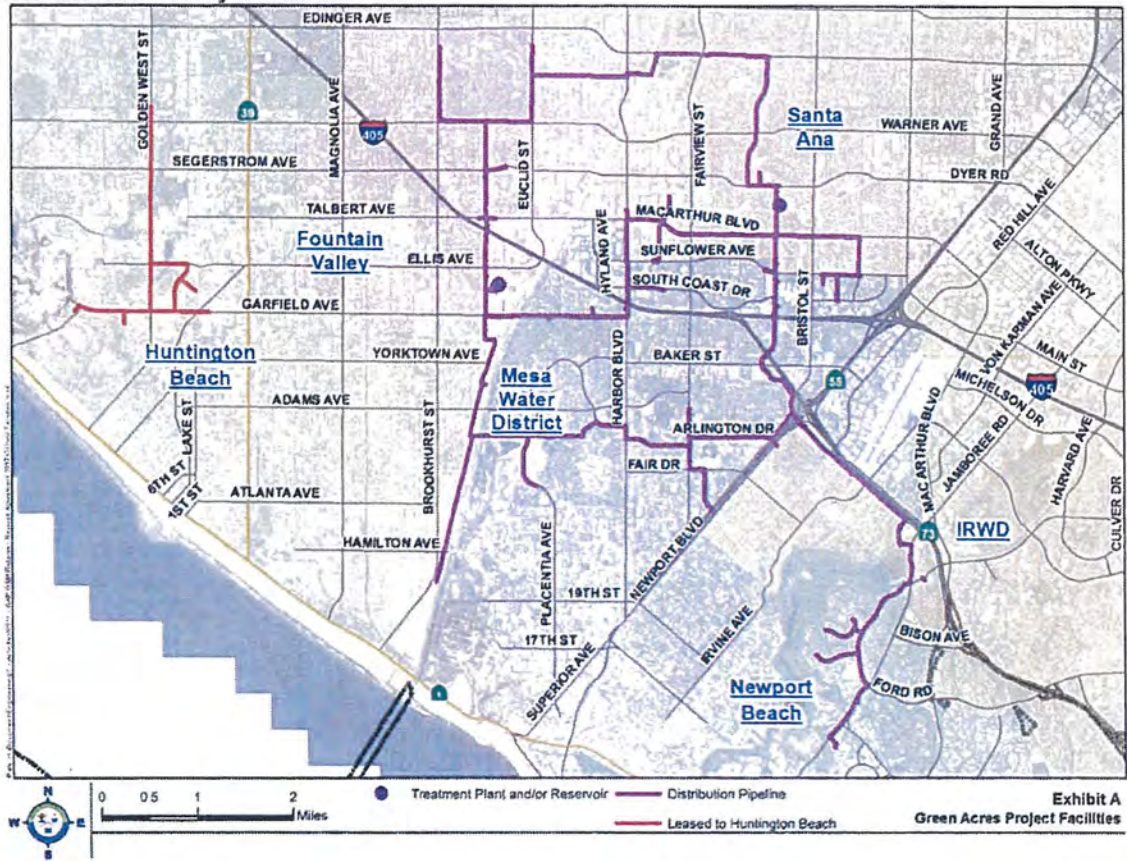


Exhibit A
Green Acres Project Facilities

Exhibit B: Green Acres Project Facilities within Jurisdiction of RETAILER

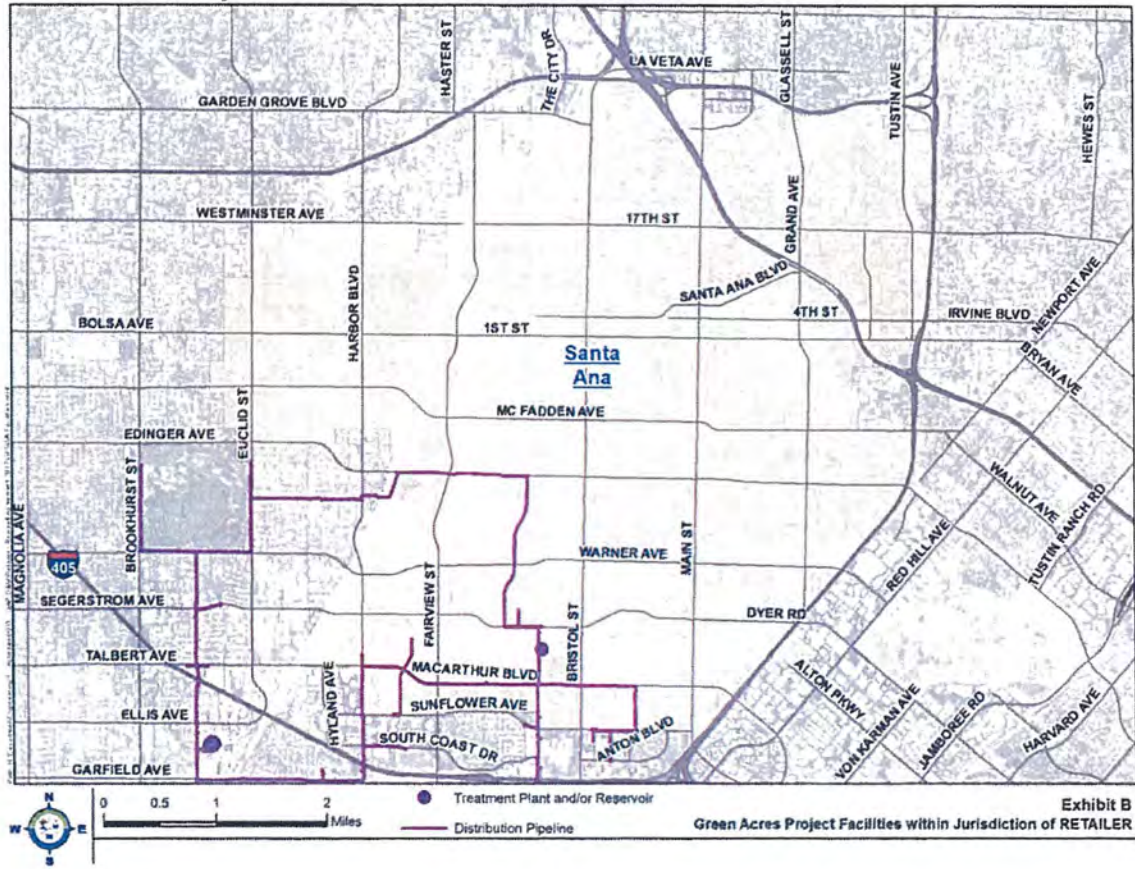


Exhibit C: RETAILER's Current Project Customers and Anticipated Annual Demand

Project Customer	Meter Number	Estimated Annual Usage (acre-feet per year)
Centennial Soccer Fields 7267	354	18.0
Centennial Soccer Fields 7266	66	0.3
Centennial Soccer Fields 7273 (A)	77341647	22.5
Centennial Soccer Fields 7273 (B)	74947636	35.6
Bomo Kora Park	144	18.6
Bike Trail 3611 S. Flower St.	3173	2.7
McFadden School	142	34.0
Adams Park	75572383	9.5
Chroma System-Carpet Dyeing	35	8.9
Chroma System-Landscape	1909	2.4
South Coast Village	6344	10.6
Kaiser Medical Office	2564	7.8
3601 MacArthur / Chick-fil-A	2864	1.6
SAR S.A. (Edinger Ave)	270	18.7
SAUD High School #6	664	27.3
Griset/MacArthur(E of Greenville St.) 2"	77341639	3.6
Griset/MacArthur(E of Greenville St.) 3"	690	13.5
Bear St./Garry: 3101 S. Bear St.	2239	3.4
Bear St./Garry: 3011 S. Bear St.	2376	1.3
Thornton Park (E end@Bear/Sergerstrom)	42	46.8
Harbor Median N. of MacArthur	10161	0.7
SAR Trail Fairview & 12th (sub-meter)	78732358	0.5
SAR Trail North of 17th (sub-meter)	6836	0.9
SAUSD Sports Complex	326	~64
Godinez High School (Centennial Park)		Sub-Meter
Versailles on the Lake Apartments		Future ~10

Exhibit D: OCWD Unit Price Calculation for Project Water Sold to RETAILER

Revisions to Exhibit D by OCWD do not require an amendment to this Agreement.

Fiscal Year 2015-2016 calculation listed below. This unit price shall be effective for Fiscal Year 2017-2018.

Previous fiscal year operational and maintenance cost to operate, treat, and distribute Product Water (Electricity, Chemicals, Labor, Maintenance, Testing, Utility Location Services, Replenishment Assessment Value of Deep Well Blending Water) \$1,173,230.46	+	Previous fiscal year Repair and Rehabilitation Fund contribution for Project Facilities. This figure may be periodically reviewed and adjusted by OCWD Board as necessary \$936,678.00	+	Debt service payments. This figure may vary as terms for loans, certificates of participation, and other Project Facilities financing change. Smoothing may occur to avoid sudden increases to this figure \$980,296.67	=	\$738 per acre foot
Previous fiscal year Project Water in acre-feet 4,186.09						

Estimated future fiscal year rates provided for planning purposes only. Rates are subject to substantive change prior to implementation.

- FY 2018-19: \$778 per acre foot
- FY 2019-20: \$769 per acre foot
- FY 2020-21: \$741 per acre foot
- FY 2021-22: \$761 per acre foot
- FY 2022-23: \$782 per acre foot

Exhibit E: Typical Project Water Quality

Revisions to Exhibit E by OCWD do not require an amendment to this Agreement.

Component	Concentration Range (mg/L)
Total Dissolved Solids	700 - 1,050
Hardness	170 - 350
Calcium	45 - 100
Magnesium	15 - 35
Potassium	10 - 25
Sodium	150 - 250
Bicarbonate	170 - 250
Chloride	170 - 320
Sulfate	160 - 225
Boron	0.3 - 0.6
Fluoride	0.7 - 1.4
Silica	15 - 24
Total Nitrogen	2.4 - 20
Phosphate Phosphorous	0.06 - 4
Chemical Oxygen Demand	10 - 35
Sodium Adsorption Ratio	3 - 7

Exhibit E shall be revised if and when OCWD modifies the tertiary treatment technology, disinfection process, and/or introduces OCSD Plant #2 effluent to the GAP treatment process.

ORDINANCE NO. XX

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF SANTA ANA ESTABLISHING INCENTIVES AND ENCOURAGING THE USE OF RECYCLED WATER FROM THE RECYCLED WATER DISTRIBUTION SYSTEM

WHEREAS, The California State Legislature adopted the Recycled Water Act of 1991, and on January 10, 2000, the Legislature established in the State Water Code Section 13500, known as and may be cited as the Water Recycling Law; Section 13550. (a), declared that the use of potable domestic water for nonpotable uses is a waste or an unreasonable use of potable water within the meaning of Section 2 of Article X of the California Constitution if recycled water is available and meets all conditions of a potential user, as determined by the State Board, pursuant to Article 2 (commencing with Section 648) of Chapter 1.5 of Division 3 of Title 23 of the California Code of regulations."

WHEREAS, City of Santa Ana (City) in partnership with Orange County Water District who owns and operates the Green Acres Project and has maintained its National Pollution Discharge Elimination Permit (a Master Recycling Permit, pursuant to Water Code Section 13523.1) and produces high-quality recycled water, having unrestricted use except for direct potable uses, for distribution to certain municipals, private entities and water companies;

WHEREAS, the City has developed an expansion to their Recycled Water Distribution System for the delivery of recycled water to its customers within the City's service area as described in the Recycled Water Feasibility Study consistent with the adopted Urban Water Management Plan;

WHEREAS, the City are desirous to comply with conservation of all available water resources, therefore, the City require the maximum reuse of recycled water for beneficial uses, and thus, agree that continued use of potable water for industrial uses and irrigation of greenbelt areas, including golf courses, parks, and highway landscaped areas, and certain other non-domestic water uses may be an unreasonable use of such water where recycled water is available;

BE IT ORDAINED by the City Council of the City of Santa Ana as follows:

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PART I - INTRODUCTION

SECTION 101 - AUTHORIZATION

This Ordinance is enacted pursuant to the authority contained in the Municipal Water District Law of 1911; California Water Code, Section 71000 et seq., as amended; and pursuant to the Recycled Water Act of 1991, California Water Code, commencing with Section 13575; and Section 13500, known as and may be cited as the Water Recycling Law, including Section 13550.

SECTION 102 - PURPOSE

The purpose of this Ordinance is to promote the conservation of all water resources and to provide for the maximum public benefit from the reuse of recycled water supplies made available from the Green Acres Project via a treatment plant which has a design capacity of 7.5 million gallons per day (MGD) which is owned and operated by Orange County Water District. The use of recycled water will be encouraged and provided for uses including, but not limited to: landscape irrigation, commercial and/or industrial process, construction, recreational impoundment, agriculture, and any additional uses permitted under Title 22, Division 4, Chapter 3, Water Recycling Criteria, Section 60301 et. seq., of the California Code of Regulations.

SECTION 103 - DEFINITION OF TERMS

The following terms are defined for the purposes of this Ordinance:

- (A) ADEQUATE QUALITY Means the quality which satisfies the requirements of regulatory agencies for a particular use.
- (B) ARTIFICIAL LAKE A human-made lake, pond, lagoon, or other body of water that is used wholly or partly for landscape, scenic or direct contact recreational purposes.
- (C) SERVICE COST: Means the amount paid by the customer for recycled water service.
- (D) CITY COUNCIL: The City Council for the City of Santa Ana (City).
- (E) MANAGER: Shall mean the Manager, or a duly Authorized Representative, of the City.
- (F) COMMERCIAL BUILDING Any building for office or commercial uses with water requirements which include, but are not limited to, landscape irrigation, toilets, urinals and decorative fountains.
- (G). SWRCB DDW: State Water Resources Control Board Division of Drinking Water.
- (H) GREENBELT AREAS: A greenbelt area includes, but is not limited to, golf courses, cemeteries, parks and landscaping.
- (I) INDUSTRIAL PROCESS WATER: water used by any industrial facility with process water requirements which include, but are not limited to, rinsing, washing, cooling and circulation, or construction, including any facility regulated by the industrial waste discharge ordinance of Orange County Water District.
- (J) RECYCLED WATER DISTRIBUTION SYSTEM: A recycled water distribution system which is owned and operated by the City.

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- (K) NPDES PERMIT: National Pollutant Discharge Elimination System Permit issued to regulate the operation of a recycled water treatment plant, the quality of recycled water produced, and to provide a Master Recycling Permit.
- (L) OFF SITE FACILITIES Water facilities from the source of supply to the point of connection with the on-site facilities including the water meter.
- (M) ON-SITE FACILITIES: Water facilities under the control of the owner, downstream from the water meter.
- (N) OWNER: The owner of a property that is anticipated to receive or is currently receiving recycled water service.
- (O) PERSON- Shall mean any individual or entity including but not limited to any person, firm, company, or corporation, partnership, association, any public corporation, political subdivision, city, county, district, the State of California, the United States of America or any department or agency thereof. The singular in each case shall include the plural.
- (P) POTABLE WATER- Water which conforms to the federal, state and local standards for human consumption.
- (Q) RECYCLED WATER- As defined in Title 22, Division 4, Chapter 3, Water Recycling Criteria, Section 60301 et. seq., of the California Code of Regulations; water which is available as a result of the treatment of wastewater. Also, as described in subdivision (n) of Section 13050 of the Water Code of the State of California, treated wastewater that is suitable for direct beneficial use or a controlled use that otherwise would not occur.
- (R) RECYCLED WATER PROPERTY • Any local entity that produces recycled water.
- (S) RECYCLED WATER DISCHARGE PERMIT- A document evidencing that an application for connection to the Recycled Water Distribution System has been prepared by the City, and examined and approved by Orange County Water District staff.
- (T) RECYCLED WATER DISTRIBUTION SYSTEM The pipelines, equipment, structures, controls, etc., used in the preparation, pumping, transmission, storage, and distribution of recycled water, owned by the City.
- (U) ORANGE COUNTY WATER DISTRICT Orange County Water District (District) are the permit holder and operator of the Green Acre Project.
- (V) SERVICE LATERAL- The City service, including but not limited to, a service valve, a meter box, a meter, and piping; between the Recycled Water Distribution System and the Customer's on-site facilities, or between the City's facilities and the Customers on-site facilities.
- (W) WHOLESALE RATE- The rate for a unit of recycled water that will be set annually, by resolution of the City Council.

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SECTION 104 – RECYCLED WATER FEASIBILITY STUDY

- (A) GENERAL: The City has prepared and adopted the City’s Recycled Water Feasibility Study (Study), December 2018, to define, encourage and develop the use of recycled water within its service area. The Study shall be updated not less often than every five years.
- (B) CONTENTS OF THE RECYCLED WATER FEASIBILITY STUDY: The Study includes, but is not limited to:
- a. PLANTS AND FACILITIES: Evaluation of the location and size of present and future recycling facilities, distribution pipelines, pump stations, reservoirs, and other related facilities, including cost estimates and potential financing methods.
 - b. RECYCLED WATER SERVICE AREAS: A designation, based on the criteria set forth in SECTION 103, and the information derived from SECTION 105, (A) and (B) a and b, of the areas within the boundaries of the City that can or may in the future use recycled water in lieu of potable water. Recycled water uses may include, but not be limited to the irrigation of greenbelt and agricultural areas, filling of artificial lakes, and appropriate industrial and commercial uses.

SECTION 105 - SEVERABILITY

If any section, subsection, sentence, clause or phrase of these rules, regulations, or requirements is for any reason found to be invalid or unconstitutional, such decision shall not affect the remaining portions of this Ordinance. The City Council of the City declares that it would have approved these rules, regulations, and requirements individually by section, subsection, sentence, clause, or phrase irrespective of the fact that any one or more of the sections, subsections, sentences, clauses or phrases may be declared invalid or unconstitutional.

SECTION 106 - RECYCLED WATER SERVICE AREA

This Ordinance shall pertain to the on-going operation, expansion and implementation of the Recycled Water Distribution System within the legal boundaries of the City service area, unless otherwise stated. With the expressed approval of the City Council recycled water service shall also be extended to lands, uses, and/or improvements lying outside the legal boundaries of City’s service area.

PART II - VOLUNTARY RECYCLED WATER USE

SECTION 201 - RECYCLED WATER SERVICE FOR CUSTOMERS

If a customer's (recycled water user) property falls within the City's service area the customer shall be prepared to accept recycled water service from the City. Depending on the location of a given property, the City shall determine the method for delivery of recycled water; it may be provided through a direct connection to the City’s Recycled Water System within the service area, or through a connection to the City’s local distribution system.

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PART III - MANDATORY RECYCLED WATER USE

SECTION 301 - FUTURE CUSTOMERS

In the event a development application is reviewed and found to be a suitable application for use of recycled water, but recycled water is not yet available to the property, such development permit shall be conditioned to require an appropriate recycled water distribution system within the project to accommodate recycled water at such time as recycled water becomes available to the site.

SECTION 302-EXISTING CUSTOMERS

- (A) The City's engineer and the District's engineer, in consultation with the prospective recycled water customer(s), shall implement a program of review of each parcel of property within the City's service area to determine which parcels would be appropriate for using recycled water for industrial processing, landscape irrigation, or other appropriate uses by the then existing customer(s).
- (B) Based on the Study, addressing the designation of each recycled water service area or the commencement of the design of new recycled water facilities, the District and the City 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 determining that conversion to recycled water service will be required, as well as, the proposed conditions and schedule for conversion.
- (C) In making such determination, the City's engineer and the District's engineer, in consultations with the prospective recycled water customer(s), shall consider, but not be limited to, the following factors:
 - 1. Whether recycled water is or will be available to the site.
 - 2. Whether the uses, processes or equipment used on the site can safely and effectively be operated with recycled water.
 - 3. Whether it is feasible to modify on-site facilities to utilize recycled water.
 - 4. Whether the use of recycled water would be cost-effective, technically feasible and cost-competitive for prospective recycled water customers.
- (D) If a property is identified as being suitable for use of recycled water and recycled water is or will be available to the site, the potential customer (property owner) shall be notified. The notice provided to a potential recycled water customer of the preliminary determination, including the proposed conditions and time scheduled for compliance shall be delivered or mailed to the potential recycled water customer.
- (E) Within thirty (30) days of such notification, the potential customer (property owner or the occupant) of the property must either:
 - 1. apply for the use of recycled water and commence the necessary work to convert to recycled water, or
 - 2. provide satisfactory evidence to the City's engineer and the District's engineer, that conversion of the site to use recycled water is not technically or economically feasible, or
 - 3. would result in the loss of diminution of an existing water right, or
 - 4. would be harmful to the public health, safety, welfare, or to the environment

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(F) At the time of commencing the work, the property owner shall furnish the City's engineer and the District's engineer, a schedule showing the time frame of when the conversion work will be completed. The City's engineer and the District's engineer may grant an extension of time for the preparation of studies, environmental review or other good reason.

(G) OBJECTIONS/APPEALS:

1. The water customer may file a notice of objection 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,
2. The objection must be in writing and specify the reasons for the objection.
3. The preliminary determination shall be final if the customer does not file a timely objection.
4. The City and the District staff shall review the objection and shall confirm, modify or abandon the preliminary determination.
5. Upon issuance of a final determination by staff, customer may appeal the determination as follows:
 - a. The customer may appeal to the City's Manager; and if not satisfied,
 - b. the customer may then appeal to the District General Manager; the District General Manager's decision shall be final.

SECTION 303 - FAILURE TO COMMENCE USE OF RECYCLED WATER

The City's Manager shall identify and give notice to all persons, firms, and corporations which have failed to commence the use of recycled water obligated under the general rule, and determine the reasons for said persons, firms, or corporations for failing to take recycled water, after being offered the opportunity.

SECTION 304 - PROCEDURES FOR INSTITUTING MANDATORY SERVICE

The City's City Council may initiate proceedings to institute mandatory service to a person, firm or corporation as follows:

- (A) The potential recycled water customer shall be notified in writing why the City's Manager has determined it is feasible to convert to recycled water service; initiating a 30-day period for filing protests or requesting a waiver.
- (B) After the 30-day protests and waivers period has expired, findings shall be made, and the City's Manager shall request of the District's Board to conduct a hearing to find the conditions for mandatory use exist.

SECTION 305 - SURCHARGE FOR FAILURE TO USE RECYCLED WATER

In the event the potential recycled water customer (property owner or the occupant) fails, neglects, or refuses to convert to the use of recycled water, such potential customer shall pay to the City's a surcharge on the amount of potable water used on the site in an amount of fifty percent (50%) of the City's highest wholesale rate for imported water.

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PART IV -FUNDING AND TECHNICAL ASSISTANCE

- (A) City will assist recycled water customers with the preparation of the customers Preliminary Engineering Report and permits for use of recycled water.
- (B) City will offer to finance a loan to the recycled water customer(s) for retrofitting the recycled water facilities at the customer's site at the interest rate available to the City.
- (C) Loans will be made for 10 years maximum.

PART V - EFFECTIVE DATE

Upon adoption, the effective date of all provisions of this Ordinance No. XX, shall be December XX, 2018.

ADOPTED this XXth day of December, 2018.

resident of the City of Santa Ana and of the City
Council thereof

ATTEST:

Secretary of the City of Santa Ana and
of the City Council thereof

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STATE OF CALIFORNIA))SS
COUNTY OF)
ORANGE)

(, _____ Secretary of the City of Santa Ana DO HEREBY CERTIFY that the foregoing Ordinance being XX was adopted at an adjourned regular Board Meeting on December XX, 2018, of said City by the following vote:

AYES:
NOES:
ABSTAIN:
ABSENT:

Secretary

```

***** KYPIPE *****
*
* Pipe Network Modeling Software
*
* CopyRighted by KYPIPE LLC (www.kypipe.com)
* Version: 9.023 06/04/2018
* Company: Ben Pak Serial #: 591177
* Interface: Classic
* Licensed for Pipe2016
*
*****

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Date & Time: Wed Feb 27 15:50:58 2019

Master File : c:\users\user\onedrive\city of santa ana\model\model updates -feb 2019\pipe1.KYP\pipe1.P2K

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*****
SUMMARY OF ORIGINAL DATA
*****

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UNITS SPECIFIED

FLOWRATE = gallons/minute
HEAD (HGL) = feet
PRESSURE = psig

PIPELINE DATA

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1 #2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
-----------	------------------	-------------	---------------	------------------	-------------------

P-1	O-Pump-3	J-16	1.00	48.00	150.0000	0.00
P-10	J-24	J-2	1222.33	24.00	140.0000	0.00
P-100	J-50	J-110	681.49	4.00	150.0000	0.00
P-102	J-44	J-23	1158.44	24.00	140.0000	0.00
P-103	J-47	J-25	3596.89	14.00	140.0000	0.00
P-105	J-80	J-109	663.29	8.00	150.0000	0.00
P-106	J-102	J-5	3585.70	24.00	140.0000	0.00
P-108	J-23	J-24	3608.13	24.00	140.0000	0.00
P-109	J-112	J-37	1588.68	24.00	140.0000	0.00
P-11	J-11	J-112	1694.46	24.00	140.0000	0.00
P-110	J-11	J-5	5661.51	24.00	140.0000	0.00
P-112	J-19	J-44	1777.66	24.00	140.0000	0.00
P-12	T-2	J-9	467.91	48.00	140.0000	0.00
P-13	O-P-HPEP-1	J-16	1.00	48.00	150.0000	0.00
P-14	T-2I-P-HPEP-2		1.00	48.00	150.0000	0.00
P-15	J-19	J-42	899.18	12.00	140.0000	0.00
P-16	O-P-HPEP-2	J-16	1.00	48.00	150.0000	0.00
P-17	J-16	J-17	568.32	36.00	140.0000	0.00
P-18	T-2I-P-LPEP-1		1.00	48.00	150.0000	0.00

P-19	O-P-LPEP-1	J-16	1.00	48.00	150.0000	0.00
P-2	I-Pump-3	T-2	1.00	48.00	150.0000	0.00
P-20	J-25	J-26	2135.32	14.00	140.0000	0.00
P-21	J-26	J-1	1172.85	14.00	140.0000	0.00
P-22	T-1	I-Pump-2	0.10	48.00	140.0000	0.00
P-23	O-Pump-2	J-7	0.10	24.00	140.0000	0.00
P-24	J-3	J-19	1998.02	24.00	140.0000	0.00
P-25	J-3	J-35	569.71	12.00	140.0000	0.00
P-26	J-32	J-102	2525.41	24.00	140.0000	0.00
P-27	J-34	J-32	1464.77	24.00	140.0000	0.00
P-28	J-10	J-3	9343.00	24.00	140.0000	0.00
P-29	J-10	J-12	3980.00	30.00	140.0000	0.00
P-3	J-24	J-8	1902.76	24.00	140.0000	0.00
P-30	J-37	J-8	854.19	24.00	140.0000	0.00
P-31	J-10	J-13	6279.00	36.00	140.0000	0.00
P-32	J-24	J-47	1016.08	14.00	140.0000	0.00
P-33	J-12	J-14	8506.00	24.00	140.0000	0.00
P-34	J-14	J-34	8506.00	24.00	140.0000	0.00
P-35	J-13	J-15	18043.00	36.00	140.0000	0.00
P-36	J-35	J-4	1864.02	12.00	150.0000	0.00
P-37	J-15	J-2	2497.40	36.00	140.0000	0.00
P-38	J-17	J-10	431.68	36.00	140.0000	0.00
P-39	J-42	J-43	1985.25	8.00	140.0000	0.00
P-4	J-5	J-6	13.81	24.00	140.0000	0.00
P-40	J-44	J-45	920.20	4.00	150.0000	0.00
P-41	J-23	J-46	1294.45	4.00	150.0000	0.00
P-42	J-47	J-48	1237.85	4.00	150.0000	0.00
P-43	J-25	J-49	2013.04	12.00	150.0000	0.00
P-44	J-25	J-50	1616.40	12.00	140.0000	0.00
P-45	J-50	J-51	1799.97	12.00	140.0000	0.00
P-46	J-17	J-18	317.05	14.00	140.0000	0.00
P-47	O-Pump-1	J-8	626.18	24.00	140.0000	0.00
P-5	J-8	J-7	285.27	24.00	140.0000	0.00
P-56	J-49	J-68	1505.94	12.00	150.0000	0.00
P-6	J-7	O-Pump-1	0.10	24.00	140.0000	0.00
P-63	J-51	J-79	834.73	8.00	140.0000	0.00
P-7	I-Pump-1	T-1	0.10	48.00	140.0000	0.00
P-8-XX	T-1	J-7	370.22	24.00	140.0000	0.00
P-9	T-2I-P-HPEP-1		1.00	48.00	150.0000	0.00
P-97	J-4	J-107	1241.66	12.00	150.0000	0.00
P-98	J-49	J-108	593.09	8.00	150.0000	0.00
P-99	J-68	J-80	497.90	12.00	150.0000	0.00

PUMP/LOSS ELEMENT DATA

THERE IS A DEVICE AT NODE P-HPEP-1 DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
514.00	0.00	75.00 (Default)
502.00	1000.00	75.00 (Default)
488.00	2000.00	75.00 (Default)
469.00	3000.00	75.00 (Default)
447.00	4000.00	75.00 (Default)
416.00	5000.00	75.00 (Default)
384.00	6000.00	75.00 (Default)
357.00	7000.00	75.00 (Default)

331.00	8000.00	75.00 (Default)
291.00	9000.00	75.00 (Default)
246.00	10000.00	75.00 (Default)
96.00	12600.00	75.00 (Default)

Pump speed ratio for the above pump = 0.800

THERE IS A DEVICE AT NODE P-HPEP-2> (ID= 1)

Pump speed ratio for the above pump = 0.800

THERE IS A DEVICE AT NODE P-LPEP-1 DESCRIBED BY THE FOLLOWING DATA: (ID= 3)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
253.00	0.00	75.00 (Default)
252.00	1000.00	75.00 (Default)
249.00	2000.00	75.00 (Default)
245.00	3000.00	75.00 (Default)
240.00	4000.00	75.00 (Default)
233.00	5000.00	75.00 (Default)
224.00	6000.00	75.00 (Default)
215.00	7000.00	75.00 (Default)
204.00	8000.00	75.00 (Default)
194.00	9000.00	75.00 (Default)
185.00	10000.00	75.00 (Default)
93.00	18800.00	75.00 (Default)

Pump speed ratio for the above pump = 0.500

THERE IS A DEVICE AT NODE Pump-1 DESCRIBED BY THE FOLLOWING DATA: (ID= 2)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
387.00	0.00	75.00 (Default)
386.00	500.00	75.00 (Default)
384.00	1000.00	75.00 (Default)
378.00	1500.00	75.00 (Default)
367.00	2000.00	75.00 (Default)
352.00	2500.00	75.00 (Default)
334.00	3000.00	75.00 (Default)
300.00	3500.00	75.00 (Default)
240.00	4000.00	75.00 (Default)
186.00	4250.00	75.00 (Default)

Pump speed ratio for the above pump = 0.750

THERE IS A DEVICE AT NODE Pump-2> (ID= 2)

Pump speed ratio for the above pump = 0.750

THERE IS A DEVICE AT NODE Pump-3> (ID= 1)

Pump speed ratio for the above pump = 0.700

N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND	JUNCTION ELEVATION	EXTERNAL GRADE
--------------	---------------	--------------------	-----------------------	-------------------

	(gpm)	(ft)	(ft)
J-1	11.34	34.60	
J-10	0.00	0.00	
J-102	43.43	57.40	
J-107	64.02	45.00	
J-108	9.65	35.00	
J-109	19.74	41.20	
J-11	6.90	41.20	
J-110	6.01	33.40	
J-112	2.84	37.80	
J-12	9.00	0.00	
J-13	1967.26	0.00	
J-14	148.00	0.00	
J-15	115.80	0.00	
J-16	1.32	37.30	
J-17	0.00	0.00	
J-18	1509.00	0.00	
J-19	115.93	35.60	
J-2	9.75	0.00	
J-23	27.83	35.90	
J-24	27.59	34.40	
J-25	30.36	33.10	
J-26	0.00	33.30	
J-3	11.58	0.00	
J-32	0.00	72.10	
J-34	0.00	46.90	
J-35	27.00	38.30	
J-37	6.88	33.70	
J-4	27.67	41.00	
J-42	22.09	34.30	
J-43	9.48	32.50	
J-44	18.31	34.10	
J-45	2.99	35.00	
J-46	13.86	33.30	
J-47	64.77	34.50	
J-48	4.34	35.10	
J-49	5.44	35.80	
J-5	0.00	55.60	
J-50	2.26	35.00	
J-51	66.93	38.50	
J-6	0.00	56.50	
J-68	6.32	37.80	
J-7	0.00	0.00	
J-79	30.52	53.20	
J-8	0.00	0.00	
J-80	0.10	39.10	
J-9	-4867.00	5.00	
O-P-HPEP-1	0.00	14.62	
O-P-HPEP-2	0.00	14.62	
O-P-LPEP-1	0.00	14.62	
I-Pump-1	0.00	35.12	
I-Pump-2	0.00	35.12	
O-Pump-3	0.00	14.62	
T-1	----	34.75	50.07
T-2	----	5.00	13.90
I-P-HPEP-1	0.00	14.62	
I-P-HPEP-2	0.00	14.62	
I-P-LPEP-1	0.00	14.62	

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O-Pump-1	0.00	35.12
O-Pump-2	0.00	35.12
I-Pump-3	0.00	14.62

OUTPUT OPTION DATA

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

MAXIMUM AND MINIMUM PRESSURES = 5
 MAXIMUM AND MINIMUM VELOCITIES = 5
 MAXIMUM AND MINIMUM HEAD LOSS/1000 = 5

SYSTEM CONFIGURATION

NUMBER OF PIPES(P) = 61
 NUMBER OF END NODES(J) = 52
 NUMBER OF PRIMARY LOOPS(L) = 8
 NUMBER OF SUPPLY NODES(F) = 2
 NUMBER OF SUPPLY ZONES(Z) = 1

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RESULTS OBTAINED AFTER 8 TRIALS: ACCURACY = 0.17866E-06

SIMULATION DESCRIPTION (LABEL)

PIPELINE RESULTS

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE #1	NODE #2	FLOWRATE	HEAD LOSS	MINOR LOSS	LINE VELO.	HL+ML/1000	HL/1000
			ft	ft	ft/s	ft/f	ft/f	ft/f
P-1	O-Pump-3	J-16	2286.73	0.00	0.00	0.41	0.01	0.01
P-10	J-24	J-2	922.17	0.08	0.00	0.65	0.07	0.07
P-100	J-50	J-110	6.01	0.02	0.00	0.15	0.03	0.03
P-102	J-44	J-23	-426.10	0.02	0.00	0.30	0.02	0.02
P-103	J-47	J-25	188.68	0.17	0.00	0.39	0.05	0.05
P-105	J-80	J-109	19.74	0.01	0.00	0.13	0.01	0.01
P-106	J-102	J-5	-467.60	0.07	0.00	0.33	0.02	0.02
P-108	J-23	J-24	-467.79	0.07	0.00	0.33	0.02	0.02
P-109	J-112	J-37	-477.34	0.03	0.00	0.34	0.02	0.02
P-11	J-11	J-112	-474.50	0.03	0.00	0.34	0.02	0.02
P-110	J-11	J-5	467.60	0.10	0.00	0.33	0.02	0.02
P-112	J-19	J-44	-404.80	0.03	0.00	0.29	0.01	0.01
P-12	T-2	J-9	-4867.00	0.02	0.00	0.86	0.05	0.05
P-13	O-P-HPEP-1	J-16	0.00	0.00	0.00	0.00	0.00	0.00
P-14	T-2I-P-HPEP-2		0.00	0.00	0.00	0.00	0.00	0.00

Device "P-HPEP-2" is closed
P-HPEP-2 0.00 -0.72 226.30 0.0 75.00 0. 0.0 0.0 ** ** 32.5 0.0000
Device "P-LPEP-1" is closed
P-LPEP-1 0.00 -0.72 226.30 0.0 75.00 0. 0.0 0.0 ** ** 32.5 0.0000
Pump-1 2159.56 14.95 206.31 191.4 75.00 104. 5.2 5.2 ** ** 48.1 0.0000
Device "Pump-2" is closed
Pump-2 0.00 14.95 206.31 0.0 75.00 0. 0.0 0.0 ** ** 48.2 0.0000
Pump-3 2286.73 -0.72 226.30 227.0 75.00 131. 6.5 6.5 ** ** 32.5 0.0000

NODE RESULTS

NODE NAME	NODE TITLE gpm	EXTERNAL DEMAND ft ft	HYDRAULIC GRADE ft	HYDRAULIC ELEVATION psi	NODE PRESSURE HEAD	NODE PRESSURE
J-1	11.34	240.77	34.60	206.17	89.34	
J-10	0.00	240.89				
J-102	43.43	241.15	57.40	183.75	79.62	
J-107	64.02	240.82	45.00	195.82	84.85	
J-108	9.65	240.75	35.00	205.75	89.16	
J-109	19.74	240.75	41.20	199.55	86.47	
J-11	6.90	241.32	41.20	200.12	86.72	
J-110	6.01	240.69	33.40	207.29	89.83	
J-112	2.84	241.35	37.80	203.55	88.21	
J-12	9.00	240.89				
J-13	1967.26	240.80				
J-14	148.00	240.95				
J-15	115.80	240.92				
J-16	1.32	240.92	37.30	203.62	88.23	
J-17	0.00	240.89				
J-18	1509.00	240.18				
J-19	115.93	240.91	35.60	205.31	88.97	
J-2	9.75	240.94				
J-23	27.83	240.96	35.90	205.06	88.86	
J-24	27.59	241.02	34.40	206.62	89.54	
J-25	30.36	240.77	33.10	207.67	89.99	
J-26	0.00	240.77	33.30	207.47	89.90	
J-3	11.58	240.90				
J-32	0.00	241.11	72.10	169.01	73.24	
J-34	0.00	241.09	46.90	194.19	84.15	
J-35	27.00	240.88	38.30	202.58	87.78	
J-37	6.88	241.38	33.70	207.68	90.00	
J-4	27.67	240.83	41.00	199.83	86.59	
J-42	22.09	240.91	34.30	206.61	89.53	
J-43	9.48	240.90	32.50	208.40	90.31	
J-44	18.31	240.94	34.10	206.84	89.63	
J-45	2.99	240.93	35.00	205.93	89.24	
J-46	13.86	240.76	33.30	207.46	89.90	
J-47	64.77	240.94	34.50	206.44	89.46	
J-48	4.34	240.92	35.10	205.82	89.19	
J-49	5.44	240.76	35.80	204.96	88.81	
J-5	0.00	241.21	55.60	185.61	80.43	
J-50	2.26	240.71	35.00	205.71	89.14	
J-51	66.93	240.66	38.50	202.16	87.60	
J-6	0.00	241.21	56.50	184.71	80.04	
J-68	6.32	240.75	37.80	202.95	87.95	
J-7	0.00	241.43				

Appendix H

J-79	30.52	240.64	53.20	187.44	81.22
J-8	0.00	241.40			
J-80	0.10	240.75	39.10	201.65	87.38
J-9	-4867.00	13.92	5.00	8.92	3.87
O-P-HPEP-1	0.00	240.92	14.62	226.30	98.06
O-P-HPEP-2	0.00	240.92	14.62	226.30	98.06
O-P-LPEP-1	0.00	240.92	14.62	226.30	98.06
I-Pump-1	0.00	50.07	35.12	14.95	6.48
I-Pump-2	0.00	50.07	35.12	14.95	6.48
O-Pump-3	0.00	240.92	14.62	226.30	98.06
T-1	----	50.07	34.75	15.32	6.64
T-2	----	13.90	5.00	8.90	3.86
I-P-HPEP-1	0.00	13.90	14.62	-0.72	-0.31
I-P-HPEP-2	0.00	13.90	14.62	-0.72	-0.31
I-P-LPEP-1	0.00	13.90	14.62	-0.72	-0.31
O-Pump-1	0.00	241.43	35.12	206.31	89.40
O-Pump-2	0.00	241.43	35.12	206.31	89.40
I-Pump-3	0.00	13.90	14.62	-0.72	-0.31

MAXIMUM AND MINIMUM VALUES

PRESSURES

JUNCTION NUMBER	MAXIMUM PRESSURES	JUNCTION NUMBER	MINIMUM PRESSURES
psi		psi	
O-P-HPEP-1	98.06	I-Pump-3	-0.31
O-P-HPEP-2	98.06	I-P-HPEP-1	-0.31
O-P-LPEP-1	98.06	I-P-HPEP-2	-0.31
O-Pump-3	98.06	I-P-LPEP-1	-0.31
J-43	90.31	T-2	3.86

VELOCITIES

PIPE NUMBER	MAXIMUM VELOCITY	PIPE NUMBER	MINIMUM VELOCITY
(ft/s)		(ft/s)	
P-46	3.14	P-20	0.02
P-3	1.19	P-21	0.02
P-5	0.93	P-99	0.06
P-6	0.93	P-39	0.06
P-12	0.86	P-98	0.06

HL + ML / 1000

PIPE NUMBER	MAXIMUM HL+ML/1000	PIPE NUMBER	MINIMUM HL+ML/1000
(ft/ft)		(ft/ft)	
P-46	2.24	P-20	0.00
P-3	0.20	P-21	0.00
P-41	0.15	P-99	0.00
P-5	0.12	P-28	0.00
P-6	0.12	P-29	0.00

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HL / 1000

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-46	2.24	P-20	0.00
P-3	0.20	P-21	0.00
P-41	0.15	P-99	0.00
P-5	0.12	P-28	0.00
P-6	0.12	P-29	0.00

SUMMARY OF INFLOWS AND OUTFLOWS

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
T-1	2159.56	
T-2	-2580.27	

NET SYSTEM INFLOW = 2159.56
NET SYSTEM OUTFLOW = -2580.27
NET SYSTEM DEMAND = -420.71

=====

TOTAL POWER COST(\$) FOR THIS SIMULATION = 251.69

**** HYDRAULIC ANALYSIS COMPLETED ****

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***** KYPIPE *****
*
* Pipe Network Modeling Software      *
*
* CopyRighted by KYPIPE LLC (www.kypipe.com) *
* Version: 9.023 06/04/2018          *
* Company: Ben Pak   Serial #: 591177  *
* Interface: Classic                    *
* Licensed for Pipe2016                *
*
*****

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Date & Time: Wed Feb 27 15:54:15 2019

Master File : c:\users\user\onedrive\city of santa ana\model\model updates -feb 2019\pipe12.KYP\pipe12.P2K

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*****
SUMMARY OF ORIGINAL DATA
*****

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UNITS SPECIFIED

FLOWRATE = gallons/minute
HEAD (HGL) = feet
PRESSURE = psig

PIPELINE DATA

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES		LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
	#1	#2	(ft)	(in)		

P-1	O-P-HPEP-3	J-16	1.00	48.00	150.0000	0.00
P-10	J-24	J-2	1222.33	24.00	140.0000	0.00
P-100	J-50	J-110	681.49	4.00	150.0000	0.00
P-102	J-44	J-23	1158.44	24.00	140.0000	0.00
P-103	J-47	J-25	3596.89	14.00	140.0000	0.00
P-104	J-55	J-62	1253.98	12.00	140.0000	0.00
P-105	J-80	J-109	663.29	8.00	150.0000	0.00
P-106	J-102	J-5	3585.70	24.00	140.0000	0.00
P-108	J-23	J-24	3608.13	24.00	140.0000	0.00
P-109	J-112	J-37	1588.68	24.00	140.0000	0.00
P-11	J-11	J-112	1694.46	24.00	140.0000	0.00
P-110	J-11	J-5	5661.51	24.00	140.0000	0.00
P-112	J-19	J-44	1777.66	24.00	140.0000	0.00
P-12	T-2	J-9	467.91	48.00	140.0000	0.00
P-13	O-P-HPEP-1	J-16	1.00	48.00	150.0000	0.00
P-14	T-2I-P-HPEP-2		1.00	48.00	150.0000	0.00
P-15	J-19	J-42	899.18	12.00	140.0000	0.00
P-16	O-P-HPEP-2	J-16	1.00	48.00	150.0000	0.00
P-17	J-16	J-17	568.32	36.00	140.0000	0.00

P-18	T-2I-P-LPEP-1		1.00	48.00	150.0000	0.00
P-19	O-P-LPEP-1	J-16	1.00	48.00	150.0000	0.00
P-2	I-P-HPEP-3	T-2	1.00	48.00	150.0000	0.00
P-20	J-25	J-26	2135.32	14.00	140.0000	0.00
P-21	J-26	J-1	1172.85	14.00	140.0000	0.00
P-22	T-1	I-P-SAR-2	0.10	48.00	140.0000	0.00
P-23	O-P-SAR-2	J-7	0.10	24.00	140.0000	0.00
P-24	J-3	J-19	1998.02	24.00	140.0000	0.00
P-25	J-3	J-35	569.71	12.00	140.0000	0.00
P-26	J-32	J-102	2525.41	24.00	140.0000	0.00
P-27	J-34	J-32	1464.77	24.00	140.0000	0.00
P-28	J-10	J-3	9343.00	24.00	140.0000	0.00
P-29	J-10	J-12	3980.00	30.00	140.0000	0.00
P-3	J-24	J-8	1902.76	24.00	140.0000	0.00
P-30	J-37	J-8	854.19	24.00	140.0000	0.00
P-31	J-10	J-13	6279.00	36.00	140.0000	0.00
P-32	J-24	J-47	1016.08	14.00	140.0000	0.00
P-33	J-12	J-14	8506.00	24.00	140.0000	0.00
P-34	J-14	J-34	8506.00	24.00	140.0000	0.00
P-35	J-13	J-15	18043.00	36.00	140.0000	0.00
P-36	J-35	J-4	1864.02	12.00	150.0000	0.00
P-37	J-15	J-2	2497.40	36.00	140.0000	0.00
P-38	J-17	J-10	431.68	36.00	140.0000	0.00
P-39	J-42	J-43	1985.25	8.00	140.0000	0.00
P-4	J-5	J-6	13.81	24.00	140.0000	0.00
P-40	J-44	J-45	920.20	4.00	150.0000	0.00
P-41	J-23	J-46	1294.45	4.00	150.0000	0.00
P-42	J-47	J-48	1237.85	4.00	150.0000	0.00
P-43	J-25	J-49	2013.04	12.00	150.0000	0.00
P-44	J-25	J-50	1616.40	12.00	140.0000	0.00
P-45	J-50	J-51	1799.97	12.00	140.0000	0.00
P-46	J-17	J-18	317.05	14.00	140.0000	0.00
P-47	J-102	I-Pump-1	2651.38	16.00	140.0000	0.00
P-48	J-55	J-61	2088.87	4.00	150.0000	0.00
P-49	O-Pump-1	J-52	1431.74	16.00	140.0000	0.00
P-5	J-8	J-7	285.27	24.00	140.0000	0.00
P-50	J-55	J-56	958.78	6.00	150.0000	0.00
P-51	J-52	J-53	3789.65	16.00	140.0000	0.00
P-52	J-54	J-55	1708.74	16.00	140.0000	0.00
P-53	J-56	J-57	1313.44	6.00	150.0000	0.00
P-54	J-62	J-63	1037.16	4.00	150.0000	0.00
P-55	J-62	J-64	3092.77	12.00	140.0000	0.00
P-56	J-49	J-68	1505.94	12.00	150.0000	0.00
P-57	J-65	J-66	3922.09	4.00	150.0000	0.00
P-58	J-65	J-67	773.18	4.00	150.0000	0.00
P-59	J-20	T-3	318.41	8.00	150.0000	0.00
P-6	J-7	O-P-SAR-1	0.10	24.00	140.0000	0.00
P-60	J-21	J-98	4745.07	12.00	140.0000	0.00
P-63	J-51	J-79	834.73	8.00	140.0000	0.00
P-7	I-P-SAR-1	T-1	0.10	48.00	140.0000	0.00
P-8-XX	T-1	J-7	370.22	24.00	140.0000	0.00
P-85	J-64	J-21	49.95	12.00	140.0000	0.00
P-86	J-99	J-100	1320.27	6.00	150.0000	0.00
P-87	J-100	J-101	1577.63	6.00	150.0000	0.00
P-89	J-53	J-54	7257.75	16.00	140.0000	0.00
P-9	T-2I-P-HPEP-1		1.00	48.00	150.0000	0.00
P-92	J-62	J-104	787.32	4.00	150.0000	0.00
P-93	J-64	J-65	2600.86	4.00	150.0000	0.00
P-94	J-98	J-99	2649.16	10.00	150.0000	0.00
P-95	J-99	J-20	769.91	8.00	150.0000	0.00

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P-96	J-100	J-106	1307.46	4.00	150.0000	0.00
P-97	J-4	J-107	1241.66	12.00	150.0000	0.00
P-98	J-49	J-108	593.09	8.00	150.0000	0.00
P-99	J-68	J-80	497.90	12.00	150.0000	0.00

PUMP/LOSS ELEMENT DATA

THERE IS A PUMP AT NODE Pump-1; USEFUL POWER = 50.00 (Efficiency = 100.00%)

THERE IS A DEVICE AT NODE P-HPEP-1 DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
514.00	0.00	75.00 (Default)
502.00	1000.00	75.00 (Default)
488.00	2000.00	75.00 (Default)
469.00	3000.00	75.00 (Default)
447.00	4000.00	75.00 (Default)
416.00	5000.00	75.00 (Default)
384.00	6000.00	75.00 (Default)
357.00	7000.00	75.00 (Default)
331.00	8000.00	75.00 (Default)
291.00	9000.00	75.00 (Default)
246.00	10000.00	75.00 (Default)
96.00	12600.00	75.00 (Default)

Pump speed ratio for the above pump = 0.800

THERE IS A DEVICE AT NODE P-HPEP-2> (ID= 1)

Pump speed ratio for the above pump = 0.800

THERE IS A DEVICE AT NODE P-HPEP-3> (ID= 1)

Pump speed ratio for the above pump = 0.750

THERE IS A DEVICE AT NODE P-LPEP-1 DESCRIBED BY THE FOLLOWING DATA: (ID= 3)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
253.00	0.00	75.00 (Default)
252.00	1000.00	75.00 (Default)
249.00	2000.00	75.00 (Default)
245.00	3000.00	75.00 (Default)
240.00	4000.00	75.00 (Default)
233.00	5000.00	75.00 (Default)
224.00	6000.00	75.00 (Default)
215.00	7000.00	75.00 (Default)
204.00	8000.00	75.00 (Default)
194.00	9000.00	75.00 (Default)
185.00	10000.00	75.00 (Default)
93.00	18800.00	75.00 (Default)

Pump speed ratio for the above pump = 0.800

THERE IS A DEVICE AT NODE P-SAR-1 DESCRIBED BY THE FOLLOWING DATA: (ID= 2)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
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387.00	0.00	75.00 (Default)
386.00	500.00	75.00 (Default)
384.00	1000.00	75.00 (Default)
378.00	1500.00	75.00 (Default)
367.00	2000.00	75.00 (Default)
352.00	2500.00	75.00 (Default)
334.00	3000.00	75.00 (Default)
300.00	3500.00	75.00 (Default)
240.00	4000.00	75.00 (Default)
186.00	4250.00	75.00 (Default)

Pump speed ratio for the above pump = 0.750

THERE IS A DEVICE AT NODE P-SAR-2> (ID= 2)

Pump speed ratio for the above pump = 0.750

N O D E D A T A

NODE NAME	NODE TITLE (gpm)	EXTERNAL DEMAND (ft)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE
J-1	11.34	34.60		
J-10	0.00	24.15		
J-100	15.65	125.30		
J-101	17.39	125.40		
J-102	43.43	57.40		
J-104	10.04	117.30		
J-106	4.49	126.10		
J-107	64.02	45.00		
J-108	9.65	35.00		
J-109	19.74	41.20		
J-11	6.90	41.20		
J-110	6.01	33.40		
J-112	2.84	37.80		
J-12	9.00	32.20		
J-13	1967.26	10.22		
J-14	148.00	34.24		
J-15	115.80	0.00		
J-16	1.32	37.30		
J-17	0.00	0.00		
J-18	1509.00	0.00		
J-19	115.93	35.60		
J-2	14.09	35.10		
J-20	115.67	118.30		
J-21	0.00	124.40		
J-23	27.83	35.90		
J-24	27.59	34.40		
J-25	30.36	33.10		
J-26	0.00	33.30		
J-3	11.58	0.00		
J-32	0.00	72.10		
J-34	0.00	46.90		
J-35	27.00	38.30		
J-37	6.88	33.70		
J-4	27.67	41.00		
J-42	22.09	34.30		

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J-43	9.48	32.50	
J-44	18.31	34.10	
J-45	2.99	35.00	
J-46	13.86	33.30	
J-47	64.77	34.50	
J-48	4.34	35.10	
J-49	5.07	35.80	
J-5	0.00	55.60	
J-50	1.70	35.00	
J-51	66.93	38.50	
J-52	35.88	70.40	
J-53	14.55	83.10	
J-54	16.49	104.80	
J-55	141.37	108.20	
J-56	0.00	102.20	
J-57	38.76	94.20	
J-6	0.00	56.50	
J-61	16.05	123.00	
J-62	5.12	112.80	
J-63	1.84	109.10	
J-64	2.55	124.30	
J-65	23.23	108.20	
J-66	18.66	98.40	
J-67	2.81	109.40	
J-68	6.32	37.80	
J-7	0.00	0.00	
J-79	30.52	53.20	
J-8	0.00	33.98	
J-80	0.00	39.10	
J-9	-4867.00	5.00	
J-98	1.65	133.20	
J-99	13.10	120.90	
O-P-HPEP-1	0.00	14.62	
O-P-HPEP-2	0.00	14.62	
O-P-HPEP-3	0.00	14.62	
O-P-LPEP-1	0.00	14.62	
I-P-SAR-1	0.00	35.12	
I-P-SAR-2	0.00	35.12	
I-Pump-1	0.00	58.60	
T-1	----	34.75	50.07
T-2	----	5.00	13.90
T-3	----	118.70	165.00
I-P-HPEP-1	0.00	14.62	
I-P-HPEP-2	0.00	14.62	
I-P-HPEP-3	0.00	14.62	
I-P-LPEP-1	0.00	14.62	
O-P-SAR-1	0.00	35.12	
O-P-SAR-2	0.00	35.12	
O-Pump-1	0.00	58.60	

OUTPUT OPTION DATA

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

MAXIMUM AND MINIMUM PRESSURES = 5

MAXIMUM AND MINIMUM VELOCITIES = 5

MAXIMUM AND MINIMUM HEAD LOSS/1000 = 5

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SYSTEM CONFIGURATION

NUMBER OF PIPES(P) = 83
 NUMBER OF END NODES(J) = 74
 NUMBER OF PRIMARY LOOPS(L) = 7
 NUMBER OF SUPPLY NODES(F) = 3
 NUMBER OF SUPPLY ZONES(Z) = 1

=====
 Case: 0

RESULTS OBTAINED AFTER 6 TRIALS: ACCURACY = 0.11892E-04

SIMULATION DESCRIPTION (LABEL)

PIPELINE RESULTS

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE #1	NODE #2	FLOWRATE	HEAD LOSS	MINOR LOSS	LINE VELO.	LINE	HL+ML/1000	HL/1000
			ft	ft/s	ft/f	ft/f	1000	1000	
P-1	O-P-HPEP-3	J-16	4220.65	0.00	0.00	0.75	0.03	0.03	
P-10	J-24	J-2	616.28	0.04	0.00	0.44	0.03	0.03	
P-100	J-50	J-110	6.01	0.02	0.00	0.15	0.03	0.03	
P-102	J-44	J-23	-77.20	0.00	0.00	0.05	0.00	0.00	
P-103	J-47	J-25	187.64	0.17	0.00	0.39	0.05	0.05	
P-104	J-55	J-62	1802.09	8.25	0.00	5.11	6.58	6.58	
P-105	J-80	J-109	19.74	0.01	0.00	0.13	0.01	0.01	
P-106	J-102	J-5	-1258.01	0.41	0.00	0.89	0.12	0.12	
P-108	J-23	J-24	-118.89	0.01	0.00	0.08	0.00	0.00	
P-109	J-112	J-37	-1267.74	0.19	0.00	0.90	0.12	0.12	
P-11	J-11	J-112	-1264.91	0.20	0.00	0.90	0.12	0.12	
P-110	J-11	J-5	1258.01	0.65	0.00	0.89	0.12	0.12	
P-112	J-19	J-44	-55.90	0.00	0.00	0.04	0.00	0.00	
P-12	T-2	J-9	-4867.00	0.02	0.00	0.86	0.05	0.05	
P-13	O-P-HPEP-1	J-16	0.00	0.00	0.00	0.00	0.00	0.00	
P-14	T-2I-P-HPEP-2		0.00	0.00	0.00	0.00	0.00	0.00	
P-15	J-19	J-42	31.56	0.00	0.00	0.09	0.00	0.00	
P-16	O-P-HPEP-2	J-16	0.00	0.00	0.00	0.00	0.00	0.00	
P-17	J-16	J-17	4219.33	0.09	0.00	1.33	0.15	0.15	
P-18	T-2I-P-LPEP-1		0.00	0.00	0.00	0.00	0.00	0.00	
P-19	O-P-LPEP-1	J-16	0.00	0.00	0.00	0.00	0.00	0.00	
P-2	I-P-HPEP-3	T-2	-4220.65	0.00	0.00	0.75	0.03	0.03	
P-20	J-25	J-26	11.34	0.00	0.00	0.02	0.00	0.00	
P-21	J-26	J-1	11.34	0.00	0.00	0.02	0.00	0.00	
P-22	T-1 I-P-SAR-2		0.00	0.00	0.00	0.00	0.00	0.00	
P-23	O-P-SAR-2	J-7	0.00	0.00	0.00	0.00	0.00	0.00	
P-24	J-3	J-19	91.59	0.00	0.00	0.06	0.00	0.00	
P-25	J-3	J-35	118.69	0.02	0.00	0.34	0.04	0.04	
P-26	J-32	J-102	850.60	0.14	0.00	0.60	0.06	0.06	

P-27	J-34	J-32	850.60	0.08	0.00	0.60	0.06	0.06
P-28	J-10	J-3	221.86	0.04	0.00	0.16	0.00	0.00
P-29	J-10	J-12	1007.61	0.10	0.00	0.46	0.03	0.03
P-3	J-24	J-8	-1019.51	0.15	0.00	0.72	0.08	0.08
P-30	J-37	J-8	-1274.62	0.10	0.00	0.90	0.12	0.12
P-31	J-10	J-13	1480.87	0.14	0.00	0.47	0.02	0.02
P-32	J-24	J-47	256.75	0.09	0.00	0.54	0.08	0.08
P-33	J-12	J-14	998.61	0.64	0.00	0.71	0.08	0.08
P-34	J-14	J-34	850.61	0.48	0.00	0.60	0.06	0.06
P-35	J-13	J-15	-486.39	0.05	0.00	0.15	0.00	0.00
P-36	J-35	J-4	91.70	0.04	0.00	0.26	0.02	0.02
P-37	J-15	J-2	-602.19	0.01	0.00	0.19	0.00	0.00
P-38	J-17	J-10	2710.34	0.03	0.00	0.85	0.07	0.07
P-39	J-42	J-43	9.48	0.01	0.00	0.06	0.00	0.00
P-4	J-5	J-6	0.00	0.00	0.00	0.00	0.00	0.00
P-40	J-44	J-45	2.99	0.01	0.00	0.08	0.01	0.01
P-41	J-23	J-46	13.86	0.19	0.00	0.35	0.15	0.15
P-42	J-47	J-48	4.34	0.02	0.00	0.11	0.02	0.02
P-43	J-25	J-49	40.78	0.01	0.00	0.12	0.01	0.01
P-44	J-25	J-50	105.16	0.06	0.00	0.30	0.03	0.03
P-45	J-50	J-51	97.45	0.05	0.00	0.28	0.03	0.03
P-46	J-17	J-18	1509.00	0.71	0.00	3.14	2.24	2.24
P-47	J-102	I-Pump-1	2065.18	5.53	0.00	3.30	2.09	2.09
P-48	J-55	J-61	16.05	0.41	0.00	0.41	0.19	0.19
P-49	O-Pump-1	J-52	2065.18	2.99	0.00	3.30	2.09	2.09
P-5	J-8	J-7	-2294.13	0.10	0.00	1.63	0.35	0.35
P-50	J-55	J-56	38.76	0.13	0.00	0.44	0.14	0.14
P-51	J-52	J-53	2029.30	7.65	0.00	3.24	2.02	2.02
P-52	J-54	J-55	1998.26	3.35	0.00	3.19	1.96	1.96
P-53	J-56	J-57	38.76	0.18	0.00	0.44	0.14	0.14
P-54	J-62	J-63	1.84	0.00	0.00	0.05	0.00	0.00
P-55	J-62	J-64	1785.09	20.00	0.00	5.06	6.47	6.47
P-56	J-49	J-68	26.06	0.00	0.00	0.07	0.00	0.00
P-57	J-65	J-66	18.66	1.01	0.00	0.48	0.26	0.26
P-58	J-65	J-67	2.81	0.01	0.00	0.07	0.01	0.01
P-59	J-20	T-3	1569.89	10.29	0.00	10.02	32.31	32.31
P-6	J-7	O-P-SAR-1	-2294.13	0.00	0.00	1.63	0.35	0.35
P-60	J-21	J-98	1737.84	29.19	0.00	4.93	6.15	6.15
P-63	J-51	J-79	30.52	0.02	0.00	0.19	0.02	0.02
P-7	I-P-SAR-1	T-1	-2294.13	0.00	0.00	0.41	0.01	0.01
P-8-XX	T-1	J-7						
P-85	J-64	J-21	1737.84	0.31	0.00	4.93	6.15	6.15
P-86	J-99	J-100	37.52	0.17	0.00	0.43	0.13	0.13
P-87	J-100	J-101	17.39	0.05	0.00	0.20	0.03	0.03
P-89	J-53	J-54	2014.75	14.46	0.00	3.21	1.99	1.99
P-9	T-21	P-HPEP-1	0.00	0.00	0.00	0.00	0.00	0.00
P-92	J-62	J-104	10.04	0.06	0.00	0.26	0.08	0.08
P-93	J-64	J-65	44.70	3.37	0.00	1.14	1.30	1.30
P-94	J-98	J-99	1736.19	34.79	0.00	7.09	13.13	13.13
P-95	J-99	J-20	1685.56	28.38	0.00	10.76	36.86	36.86
P-96	J-100	J-106	4.49	0.02	0.00	0.11	0.02	0.02
P-97	J-4	J-107	64.02	0.01	0.00	0.18	0.01	0.01
P-98	J-49	J-108	9.65	0.00	0.00	0.06	0.00	0.00
P-99	J-68	J-80	19.74	0.00	0.00	0.06	0.00	0.00

PUMP/LOSS ELEMENT RESULTS

Appendix H

NAME	FLOWRATE	INLET HEAD	OUTLET HEAD	PUMP EFFIC	USEFUL HEAD	INCREM	MTL ENCY	TOTAL POWER	#PUMPS	#PUMPS	NPSH	Case Avail.
	gpm	ft	ft	%	Hp	\$	\$	ft				

Device "P-HPEP-1" is closed												
P-HPEP-1	0.00	-0.72	221.35	0.0	75.00	0.0	0.0	0.0	**	**	32.5	0.0000
Device "P-HPEP-2" is closed												
P-HPEP-2	0.00	-0.72	221.35	0.0	75.00	0.0	0.0	0.0	**	**	32.5	0.0000
P-HPEP-3	4220.65	-0.72	221.35	222.1	75.00	237.0	11.8	11.8	**	**	32.5	0.0000
Device "P-LPEP-1" is closed												
P-LPEP-1	0.00	-0.72	221.35	0.0	75.00	0.0	0.0	0.0	**	**	32.5	0.0000
P-SAR-1	2294.13	14.95	200.95	186.0	75.00	108.0	5.4	5.4	**	**	48.1	0.0000
Device "P-SAR-2" is closed												
P-SAR-2	0.00	14.95	200.95	0.0	75.00	0.0	0.0	0.0	**	**	48.2	0.0000
Pump-1	2065.18	170.28	266.06	95.8	100.00	50.0	1.9	1.9	**	**	203.3	0.0000

NODE RESULTS

NODE NAME	NODE TITLE	EXTERNAL DEMAND	HYDRAULIC GRADE	NODE ELEVATION	PRESSURE HEAD	NODE PRESSURE
	gpm	ft	ft	ft	psi	

J-1	11.34	235.56	34.60	200.96	87.08	
J-10	0.00	235.85	24.15	211.70	91.74	
J-100	15.65	203.49	125.30	78.19	33.88	
J-101	17.39	203.44	125.40	78.04	33.82	
J-102	43.43	234.41	57.40	177.01	76.70	
J-104	10.04	287.89	117.30	170.59	73.92	
J-106	4.49	203.47	126.10	77.37	33.53	
J-107	64.02	235.73	45.00	190.73	82.65	
J-108	9.65	235.55	35.00	200.55	86.90	
J-109	19.74	235.54	41.20	194.34	84.21	
J-11	6.90	235.48	41.20	194.28	84.19	
J-110	6.01	235.48	33.40	202.08	87.57	
J-112	2.84	235.68	37.80	197.88	85.75	
J-12	9.00	235.75	32.20	203.55	88.21	
J-13	1967.26	235.72	10.22	225.50	97.72	
J-14	148.00	235.11	34.24	200.87	87.04	
J-15	115.80	235.77				
J-16	1.32	235.97	37.30	198.67	86.09	
J-17	0.00	235.88				
J-18	1509.00	235.17				
J-19	115.93	235.81	35.60	200.21	86.76	
J-2	14.09	235.78	35.10	200.68	86.96	
J-20	115.67	175.29	118.30	56.99	24.69	
J-21	0.00	267.65	124.40	143.25	62.07	
J-23	27.83	235.81	35.90	199.91	86.63	
J-24	27.59	235.82	34.40	201.42	87.28	
J-25	30.36	235.56	33.10	202.46	87.73	
J-26	0.00	235.56	33.30	202.26	87.65	
J-3	11.58	235.81				
J-32	0.00	234.55	72.10	162.45	70.40	
J-34	0.00	234.63	46.90	187.73	81.35	
J-35	27.00	235.79	38.30	197.49	85.58	
J-37	6.88	235.86	33.70	202.16	87.60	
J-4	27.67	235.74	41.00	194.74	84.39	
J-42	22.09	235.81	34.30	201.51	87.32	

Appendix H

J-43	9.48	235.80	32.50	203.30	88.10
J-44	18.31	235.81	34.10	201.71	87.41
J-45	2.99	235.80	35.00	200.80	87.01
J-46	13.86	235.62	33.30	202.32	87.67
J-47	64.77	235.73	34.50	201.23	87.20
J-48	4.34	235.71	35.10	200.61	86.93
J-49	5.07	235.55	35.80	199.75	86.56
J-5	0.00	234.82	55.60	179.22	77.66
J-50	1.70	235.51	35.00	200.51	86.89
J-51	66.93	235.45	38.50	196.95	85.35
J-52	35.88	321.68	70.40	251.28	108.89
J-53	14.55	314.02	83.10	230.92	100.07
J-54	16.49	299.56	104.80	194.76	84.40
J-55	141.37	296.20	108.20	188.00	81.47
J-56	0.00	296.07	102.20	193.87	84.01
J-57	38.76	295.89	94.20	201.69	87.40
J-6	0.00	234.82	56.50	178.32	77.27
J-61	16.05	295.80	123.00	172.80	74.88
J-62	5.12	287.95	112.80	175.15	75.90
J-63	1.84	287.95	109.10	178.85	77.50
J-64	2.55	267.96	124.30	143.66	62.25
J-65	23.23	264.58	108.20	156.38	67.77
J-66	18.66	263.57	98.40	165.17	71.58
J-67	2.81	264.58	109.40	155.18	67.24
J-68	6.32	235.55	37.80	197.75	85.69
J-7	0.00	236.07			
J-79	30.52	235.43	53.20	182.23	78.97
J-8	0.00	235.96	33.98	201.99	87.53
J-80	0.00	235.55	39.10	196.45	85.13
J-9	-4867.00	13.92	5.00	8.92	3.87
J-98	1.65	238.46	133.20	105.26	45.61
J-99	13.10	203.67	120.90	82.77	35.86
O-P-HPEP-1	0.00	235.97	14.62	221.35	95.92
O-P-HPEP-2	0.00	235.97	14.62	221.35	95.92
O-P-HPEP-3	0.00	235.97	14.62	221.35	95.92
O-P-LPEP-1	0.00	235.97	14.62	221.35	95.92
I-P-SAR-1	0.00	50.07	35.12	14.95	6.48
I-P-SAR-2	0.00	50.07	35.12	14.95	6.48
I-Pump-1	0.00	228.88	58.60	170.28	73.79
T-1	----	50.07	34.75	15.32	6.64
T-2	----	13.90	5.00	8.90	3.86
T-3	----	165.00	118.70	46.30	20.06
I-P-HPEP-1	0.00	13.90	14.62	-0.72	-0.31
I-P-HPEP-2	0.00	13.90	14.62	-0.72	-0.31
I-P-HPEP-3	0.00	13.90	14.62	-0.72	-0.31
I-P-LPEP-1	0.00	13.90	14.62	-0.72	-0.31
O-P-SAR-1	0.00	236.07	35.12	200.95	87.08
O-P-SAR-2	0.00	236.07	35.12	200.95	87.08
O-Pump-1	0.00	324.66	58.60	266.06	115.29

MAXIMUM AND MINIMUM VALUES

PRESSURES

JUNCTION NUMBER	MAXIMUM PRESSURES	JUNCTION NUMBER	MINIMUM PRESSURES
psi		psi	

Appendix H

O-Pump-1	115.29	I-P-HPEP-3	-0.31
J-52	108.89	I-P-HPEP-1	-0.31
J-53	100.07	I-P-HPEP-2	-0.31
J-13	97.72	I-P-LPEP-1	-0.31
O-P-HPEP-1	95.92	T-2	3.86

VELOCITIES

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-95	10.76	P-20	0.02
P-59	10.02	P-21	0.02
P-94	7.09	P-112	0.04
P-104	5.11	P-54	0.05
P-55	5.06	P-102	0.05

HL + ML / 1000

PIPE NUMBER	MAXIMUM HL+ML/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL+ML/1000 (ft/ft)
P-95	36.86	P-20	0.00
P-59	32.31	P-21	0.00
P-94	13.13	P-112	0.00
P-104	6.58	P-102	0.00
P-55	6.47	P-24	0.00

HL / 1000

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-95	36.86	P-20	0.00
P-59	32.31	P-21	0.00
P-94	13.13	P-112	0.00
P-104	6.58	P-102	0.00
P-55	6.47	P-24	0.00

SUMMARY OF INFLOWS AND OUTFLOWS

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
 (-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
T-1	2294.13	
T-2	-646.35	
T-3	-1569.89	

NET SYSTEM INFLOW = 2294.13
 NET SYSTEM OUTFLOW = -2216.24
 NET SYSTEM DEMAND = 77.89

Appendix H

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TOTAL POWER COST(\$) FOR THIS SIMULATION = 382.85

***** HYDRAULIC ANALYSIS COMPLETED *****

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***** KYPIPE *****
*
* Pipe Network Modeling Software      *
*
* CopyRighted by KYPIPE LLC (www.kypipe.com) *
* Version: 9.023 06/04/2018          *
* Company: Ben Pak   Serial #: 591177  *
* Interface: Classic                    *
* Licensed for Pipe2016                *
*
*****

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Date & Time: Wed Feb 27 15:55:44 2019

Master File : c:\users\user\onedrive\city of santa ana\model\model updates -feb 2019\pipe123.KYP\pipe123.P2K

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*****
SUMMARY OF ORIGINAL DATA
*****

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UNITS SPECIFIED

FLOWRATE = gallons/minute
HEAD (HGL) = feet
PRESSURE = psig

PIPELINE DATA

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES		LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
	#1	#2				
P-1	O-Pump-2	J-52	3114.23	16.00	140.0000	0.00
P-10	J-55	J-61	2088.87	4.00	150.0000	0.00
P-102	J-44	J-23	1158.44	24.00	140.0000	0.00
P-103	J-47	J-25	3596.89	14.00	140.0000	0.00
P-104	J-55	J-62	1253.98	12.00	140.0000	0.00
P-105	J-80	J-109	663.29	8.00	150.0000	0.00
P-106	J-102	J-5	3585.70	24.00	140.0000	0.00
P-108	J-24	J-23	3594.43	24.00	140.0000	0.00
P-109	J-112	J-37	1588.68	24.00	140.0000	0.00
P-11	J-11	J-112	1694.46	24.00	140.0000	0.00
P-110	J-11	J-5	5661.51	24.00	140.0000	0.00
P-112	J-19	J-44	1777.66	24.00	140.0000	0.00
P-12	J-13	J-15	6279.00	36.00	140.0000	0.00
P-14	O-Pump-3	J-81	1351.36	12.00	150.0000	0.00
P-15	J-19	J-42	899.18	12.00	140.0000	0.00
P-16	J-3	T-3	1590.12	48.00	100.1000	0.00
P-17	J-16	J-19	2000.84	24.00	140.0000	0.00
P-18	T-3I-P-HPEP-3		1.00	48.00	150.0000	0.00
P-19	O-P-HPEP-3	J-10	1.00	48.00	150.0000	0.00
P-2	J-55	J-56	958.78	6.00	150.0000	0.00

P-20	J-80	J-69	2155.95	12.00	150.0000	0.00
P-22	J-10	J-12	566.50	36.00	150.0000	0.00
P-23	J-12	J-13	599.38	36.00	140.0000	0.00
P-24	T-3I-P-HPEP-2		1.00	48.00	150.0000	0.00
P-25	O-P-HPEP-2	J-10	1.00	48.00	150.0000	0.00
P-26	J-32	J-102	2525.41	24.00	140.0000	0.00
P-27	J-34	J-32	1464.77	24.00	140.0000	0.00
P-28	J-13	J-16	390.07	24.00	140.0000	0.00
P-29	T-3I-P-HPEP-1		1.00	48.00	150.0000	0.00
P-3	J-8	J-24	1874.99	24.00	140.0000	0.00
P-30	J-37	J-8	854.19	24.00	140.0000	0.00
P-31	J-35	J-16	561.81	12.00	100.1000	0.00
P-32	J-47	J-24	1029.28	14.00	140.0000	0.00
P-33	T-3I-P-LPEP-1		1.00	48.00	150.0000	0.00
P-34	O-P-LPEP-1	J-10	1.00	48.00	150.0000	0.00
P-35	O-P-HPEP-1	J-10	1.00	48.00	150.0000	0.00
P-36	J-35	J-4	1864.02	12.00	140.0000	0.00
P-37	J-12	J-14	1591.50	14.00	140.0000	0.00
P-38	J-15	J-18	18043.00	36.00	140.0000	0.00
P-39	J-42	J-43	1985.25	8.00	140.0000	0.00
P-4	J-5	J-6	13.81	24.00	140.0000	0.00
P-40	J-44	J-45	920.20	8.00	150.0000	0.00
P-41	J-23	J-46	1294.45	8.00	150.0000	0.00
P-42	J-48	J-24	1222.33	24.00	140.0000	0.00
P-43	J-25	J-49	2013.04	14.00	140.0000	0.00
P-44	J-25	J-50	1616.40	14.00	140.0000	0.00
P-46	J-52	J-53	3789.65	16.00	140.0000	0.00
P-47	J-54	J-55	1708.74	16.00	140.0000	0.00
P-5	J-8	J-7	285.27	24.00	140.0000	0.00
P-52	J-62	J-63	1037.16	4.00	150.0000	0.00
P-53	J-62	J-64	3092.77	12.00	140.0000	0.00
P-54	J-65	J-66	3922.09	4.00	150.0000	0.00
P-55	J-65	J-67	773.18	4.00	150.0000	0.00
P-56	J-49	J-68	1505.94	14.00	140.0000	0.00
P-57	J-18	J-48	2497.40	24.00	140.0000	0.00
P-58	J-17	J-20	8506.00	24.00	140.0000	0.00
P-59	J-20	J-34	8506.00	24.00	140.0000	0.00
P-6	T-1 I-P-SAR-2		175.05	48.00	140.0000	0.00
P-60	O-P-SAR-1	J-7	369.47	48.00	140.0000	0.00
P-61	O-P-SAR-2	J-7	252.26	48.00	140.0000	0.00
P-64	J-21	J-75	1236.42	12.00	150.0000	0.00
P-65	J-69	J-70	3795.16	12.00	150.0000	0.00
P-66	J-71	J-73	5734.74	12.00	150.0000	0.00
P-7	T-1 I-P-SAR-1		297.02	48.00	140.0000	0.00
P-71	J-70	I-Pump-3	1881.25	12.00	150.0000	0.00
P-72	J-81	J-21	2242.65	12.00	150.0000	0.00
P-73	J-75	J-77	700.71	12.00	150.0000	0.00
P-74	J-77	J-71	665.20	12.00	150.0000	0.00
P-75	J-73	J-83	1631.39	12.00	150.0000	0.00
P-76	J-83	J-84	492.67	8.00	100.1000	0.00
P-77	J-83	J-85	2480.15	12.00	150.0000	0.00
P-8	T-1	J-7	370.22	24.00	100.1000	0.00
P-80	J-86	J-89	2650.79	12.00	150.0000	0.00
P-81	J-90	T-5	699.47	12.00	150.0000	0.00
P-83	J-70	J-95	1719.32	8.00	150.0000	0.00
P-84	J-85	J-86	2584.33	12.00	150.0000	0.00
P-85	J-64	J-98	4795.01	12.00	140.0000	0.00
P-86	J-99	J-100	1320.27	6.00	150.0000	0.00
P-87	J-100	J-101	1577.63	6.00	150.0000	0.00
P-88	J-102	I-Pump-2	986.86	16.00	140.0000	0.00

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P-89	J-53	J-54	7257.75	16.00	140.0000	0.00
P-9	J-13	J-17	3980.00	30.00	140.0000	0.00
P-90	J-86	i-472	964.49	8.00	150.0000	0.00
P-91	J-89	J-90	4338.08	12.00	150.0000	0.00
P-92	J-62	J-104	787.32	4.00	150.0000	0.00
P-93	J-64	J-65	2600.86	4.00	150.0000	0.00
P-94	J-98	J-99	2649.16	10.00	150.0000	0.00
P-95	J-99	T-4	1083.34	8.00	150.0000	0.00
P-96	J-100	J-106	1307.46	4.00	150.0000	0.00
P-97	J-4	J-107	1241.66	12.00	140.0000	0.00
P-99	J-68	J-80	497.90	14.00	140.0000	0.00

PUMP/LOSS ELEMENT DATA

THERE IS A PUMP AT NODE Pump-2; USEFUL POWER = 70.00 (Efficiency = 100.00%)

THERE IS A PUMP AT NODE Pump-3; USEFUL POWER = 50.00 (Efficiency = 0.75%)

THERE IS A DEVICE AT NODE P-HPEP-1 DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
514.00	0.00	75.00 (Default)
502.00	1000.00	75.00 (Default)
488.00	2000.00	75.00 (Default)
469.00	3000.00	75.00 (Default)
447.00	4000.00	75.00 (Default)
416.00	5000.00	75.00 (Default)
384.00	6000.00	75.00 (Default)
357.00	7000.00	75.00 (Default)
331.00	8000.00	75.00 (Default)
291.00	9000.00	75.00 (Default)
246.00	10000.00	75.00 (Default)
96.00	12600.00	75.00 (Default)

THERE IS A DEVICE AT NODE P-HPEP-2> (ID= 1)

THERE IS A DEVICE AT NODE P-HPEP-3> (ID= 1)

THERE IS A DEVICE AT NODE P-LPEP-1 DESCRIBED BY THE FOLLOWING DATA: (ID= 2)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
253.00	0.00	75.00 (Default)
252.00	1000.00	75.00 (Default)
249.00	2000.00	75.00 (Default)
245.00	3000.00	75.00 (Default)
240.00	4000.00	75.00 (Default)
233.00	5000.00	75.00 (Default)
224.00	6000.00	75.00 (Default)
215.00	7000.00	75.00 (Default)
204.00	8000.00	75.00 (Default)
194.00	9000.00	75.00 (Default)
185.00	10000.00	75.00 (Default)
93.00	18800.00	75.00 (Default)

THERE IS A DEVICE AT NODE P-SAR-1 DESCRIBED BY THE FOLLOWING DATA: (ID= 3)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
387.00	0.00	75.00 (Default)
386.00	500.00	75.00 (Default)
384.00	1000.00	75.00 (Default)
378.00	1500.00	75.00 (Default)
367.00	2000.00	75.00 (Default)
352.00	2500.00	75.00 (Default)
334.00	3000.00	75.00 (Default)
300.00	3500.00	75.00 (Default)
240.00	4000.00	75.00 (Default)
186.00	4250.00	75.00 (Default)

Pump speed ratio for the above pump = 0.750

THERE IS A DEVICE AT NODE P-SAR-2> (ID= 3)

Pump speed ratio for the above pump = 0.750

N O D E D A T A

NODE NAME	NODE TITLE (gpm)	EXTERNAL DEMAND (ft)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE
i-472	23.27	151.50		
J-10	1.32	37.30		
J-100	15.65	125.30		
J-101	17.39	125.40		
J-102	43.36	57.40		
J-104	10.04	117.30		
J-106	4.49	126.10		
J-107	64.02	45.00		
J-109	19.74	41.20		
J-11	6.90	41.20		
J-112	2.84	37.80		
J-12	0.00	0.00		
J-13	0.00	24.15		
J-14	1509.00	25.24		
J-15	0.00	0.00		
J-16	1.32	37.30		
J-17	9.00	32.20		
J-18	0.00	42.24		
J-19	115.93	35.60		
J-20	148.00	34.24		
J-21	14.73	68.80		
J-23	27.83	35.90		
J-24	29.05	34.40		
J-25	41.71	33.10		
J-3	-4867.00	5.00		
J-32	0.32	72.10		
J-34	1000.00	46.90		
J-35	27.00	38.30		
J-37	6.88	33.70		
J-4	26.99	41.00		
J-42	22.09	34.30		

J-43	9.48	32.50	
J-44	18.31	34.10	
J-45	2.99	35.00	
J-46	13.86	33.30	
J-47	64.77	34.50	
J-48	14.09	35.10	
J-49	15.10	35.80	
J-5	0.00	55.60	
J-50	105.72	35.00	
J-52	35.88	70.40	
J-53	14.55	83.10	
J-54	16.49	104.80	
J-55	141.37	108.20	
J-56	38.76	102.20	
J-6	0.00	56.50	
J-61	16.05	123.00	
J-62	5.12	112.80	
J-63	1.84	109.10	
J-64	2.55	124.30	
J-65	23.23	108.20	
J-66	18.66	98.40	
J-67	2.81	109.40	
J-68	6.32	37.80	
J-69	38.47	45.50	
J-7	0.00	0.00	
J-70	12.72	56.10	
J-71	27.16	83.70	
J-73	2.39	121.40	
J-75	34.72	75.20	
J-77	4.45	79.50	
J-8	0.00	33.98	
J-80	0.76	39.10	
J-81	31.79	62.70	
J-83	22.97	124.10	
J-84	24.17	122.10	
J-85	10.88	140.00	
J-86	35.90	153.20	
J-89	12.91	170.00	
J-90	10.14	181.20	
J-95	7.47	54.00	
J-98	1.65	133.20	
J-99	128.77	120.90	
O-P-HPEP-1	0.00	14.62	
O-P-HPEP-2	0.00	14.62	
O-P-HPEP-3	0.00	14.62	
O-P-LPEP-1	0.00	14.62	
I-P-SAR-1	0.00	35.12	
I-P-SAR-2	0.00	35.12	
I-Pump-2	0.00	58.60	
O-Pump-3	0.00	56.00	
T-1	----	34.75	50.07
T-3	----	5.00	13.90
T-4	----	118.70	165.00
T-5	----	184.70	245.00
I-P-HPEP-1	0.00	14.62	
I-P-HPEP-2	0.00	14.62	
I-P-HPEP-3	0.00	14.62	
I-P-LPEP-1	0.00	14.62	
O-P-SAR-1	0.00	35.12	
O-P-SAR-2	0.00	35.12	

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O-Pump-2 0.00 58.60
 I-Pump-3 0.00 56.00

OUTPUT OPTION DATA

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT
 MAXIMUM AND MINIMUM PRESSURES = 5
 MAXIMUM AND MINIMUM VELOCITIES = 5
 MAXIMUM AND MINIMUM HEAD LOSS/1000 = 5

SYSTEM CONFIGURATION

NUMBER OF PIPES(P) = 91
 NUMBER OF END NODES(J) = 81
 NUMBER OF PRIMARY LOOPS(L) = 7
 NUMBER OF SUPPLY NODES(F) = 4
 NUMBER OF SUPPLY ZONES(Z) = 1

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RESULTS OBTAINED AFTER 8 TRIALS: ACCURACY = 0.17452E-04

SIMULATION DESCRIPTION (LABEL)

PIPELINE RESULTS

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS		FLOWRATE	HEAD	MINOR	LINE	HL+ML/	HL/
	#1	#2	LOSS	LOSS	VELO.	1000	1000	
	gpm		ft	ft	ft/s	ft/f	ft/f	
P-1	O-Pump-2	J-52	1795.79	5.02	0.00	2.87	1.61	1.61
P-10	J-55	J-61	16.05	0.41	0.00	0.41	0.19	0.19
P-102	J-44	J-23	12427.37	9.31	0.00	8.81	8.04	8.04
P-103	J-47	J-25	1377.82	6.80	0.00	2.87	1.89	1.89
P-104	J-55	J-62	1532.69	6.11	0.00	4.35	4.88	4.88
P-105	J-80	J-109	19.74	0.01	0.00	0.13	0.01	0.01
P-106	J-102	J-5	6200.20	7.95	0.00	4.40	2.22	2.22
P-108	J-24	J-23	-12385.67	28.72	0.00	8.78	7.99	7.99
P-109	J-112	J-37	6190.46	3.51	0.00	4.39	2.21	2.21
P-11	J-11	J-112	6193.30	3.75	0.00	4.39	2.21	2.21
P-110	J-11	J-5	-6200.20	12.56	0.00	4.40	2.22	2.22
P-112	J-19	J-44	12448.66	14.34	0.00	8.83	8.07	8.07
P-12	J-13	J-15	14108.18	8.86	0.00	4.45	1.41	1.41
P-14	O-Pump-3	J-81	1129.81	3.30	0.00	3.20	2.44	2.44
P-15	J-19	J-42	31.56	0.00	0.00	0.09	0.00	0.00
P-16	J-3	T-3	4867.00	0.14	0.00	0.86	0.09	0.09
P-17	J-16	J-19	12596.15	16.50	0.00	8.93	8.24	8.24

P-18	T-31-P-HPEP-3	10447.18	0.00	0.00	1.85	0.18	0.18
P-19	O-P-HPEP-3 J-10	10447.18	0.00	0.00	1.85	0.18	0.18
P-2	J-55 J-56	38.76	0.13	0.00	0.44	0.14	0.14
P-20	J-80 J-69	1188.48	5.77	0.00	3.37	2.68	2.68
P-22	J-10 J-12	37529.34	4.31	0.00	11.83	7.61	7.61
P-23	J-12 J-13	36020.35	4.80	0.00	11.35	8.01	8.01
P-24	T-31-P-HPEP-2	10447.18	0.00	0.00	1.85	0.18	0.18
P-25	O-P-HPEP-2 J-10	10447.18	0.00	0.00	1.85	0.18	0.18
P-26	J-32 J-102	8039.36	9.06	0.00	5.70	3.59	3.59
P-27	J-34 J-32	8039.68	5.26	0.00	5.70	3.59	3.59
P-28	J-13 J-16	12715.48	3.27	0.00	9.02	8.39	8.39
P-29	T-31-P-HPEP-1	10447.18	0.00	0.00	1.85	0.18	0.18
P-3	J-8 J-24	-25008.13	55.05	0.00	17.73	29.36	29.36
P-30	J-37 J-8	6183.58	1.89	0.00	4.39	2.21	2.21
P-31	J-35 J-16	-118.01	0.04	0.00	0.33	0.08	0.08
P-32	J-47 J-24	-1442.59	2.12	0.00	3.01	2.06	2.06
P-33	T-31-P-LPEP-1	6189.12	0.00	0.00	1.10	0.07	0.07
P-34	O-P-LPEP-1 J-10	6189.12	0.00	0.00	1.10	0.07	0.07
P-35	O-P-HPEP-1 J-10	10447.18	0.00	0.00	1.85	0.18	0.18
P-36	J-35 J-4	91.01	0.05	0.00	0.26	0.03	0.03
P-37	J-12 J-14	1509.00	3.56	0.00	3.14	2.24	2.24
P-38	J-15 J-18	14108.18	25.47	0.00	4.45	1.41	1.41
P-39	J-42 J-43	9.48	0.01	0.00	0.06	0.00	0.00
P-4	J-5 J-6	0.00	0.00	0.00	0.00	0.00	0.00
P-40	J-44 J-45	2.99	0.00	0.00	0.02	0.00	0.00
P-41	J-23 J-46	13.86	0.01	0.00	0.09	0.01	0.01
P-42	J-48 J-24	14094.09	12.41	0.00	9.99	10.15	10.15
P-43	J-25 J-49	1230.40	3.08	0.00	2.56	1.53	1.53
P-44	J-25 J-50	105.72	0.03	0.00	0.22	0.02	0.02
P-46	J-52 J-53	1759.90	5.88	0.00	2.81	1.55	1.55
P-47	J-54 J-55	1728.86	2.56	0.00	2.76	1.50	1.50
P-5	J-8 J-7	31191.71	12.61	0.00	22.12	44.20	44.20
P-52	J-62 J-63	1.84	0.00	0.00	0.05	0.00	0.00
P-53	J-62 J-64	1515.69	14.77	0.00	4.30	4.78	4.78
P-54	J-65 J-66	18.66	1.01	0.00	0.48	0.26	0.26
P-55	J-65 J-67	2.81	0.01	0.00	0.07	0.01	0.01
P-56	J-49 J-68	1215.30	2.25	0.00	2.53	1.50	1.50
P-57	J-18 J-48	14108.18	25.40	0.00	10.00	10.17	10.17
P-58	J-17 J-20	9187.68	39.09	0.00	6.52	4.60	4.60
P-59	J-20 J-34	9039.68	37.93	0.00	6.41	4.46	4.46
P-6	T-1 I-P-SAR-2	0.00	0.00	0.00	0.00	0.00	0.00
P-60	O-P-SAR-1 J-7	3560.95	0.01	0.00	0.63	0.03	0.03
P-61	O-P-SAR-2 J-7	0.00	0.00	0.00	0.00	0.00	0.00
P-64	J-21 J-75	1083.30	2.79	0.00	3.07	2.26	2.26
P-65	J-69 J-70	1150.01	9.56	0.00	3.26	2.52	2.52
P-66	J-71 J-73	1016.98	11.51	0.00	2.88	2.01	2.01
P-7	T-1 I-P-SAR-1	3560.95	0.01	0.00	0.63	0.03	0.03
P-71	J-70 I-Pump-3	1129.81	4.59	0.00	3.20	2.44	2.44
P-72	J-81 J-21	1098.03	5.19	0.00	3.11	2.31	2.31
P-73	J-75 J-77	1048.59	1.49	0.00	2.97	2.12	2.12
P-74	J-77 J-71	1044.14	1.40	0.00	2.96	2.11	2.11
P-75	J-73 J-83	1014.60	3.26	0.00	2.88	2.00	2.00
P-76	J-83 J-84	24.17	0.01	0.00	0.15	0.03	0.03
P-77	J-83 J-85	967.46	4.54	0.00	2.74	1.83	1.83
P-8	T-1 J-7	-34752.65	37.21	0.00	24.64	100.52	100.52
P-80	J-86 J-89	897.42	4.22	0.00	2.55	1.59	1.59
P-81	J-90 T-5	874.36	1.06	0.00	2.48	1.52	1.52
P-83	J-70 J-95	7.47	0.00	0.00	0.05	0.00	0.00
P-84	J-85 J-86	956.58	4.63	0.00	2.71	1.79	1.79
P-85	J-64 J-98	1468.44	21.59	0.00	4.17	4.50	4.50

Appendix H

P-86	J-99	J-100	37.52	0.17	0.00	0.43	0.13	0.13
P-87	J-100	J-101	17.39	0.05	0.00	0.20	0.03	0.03
P-88	J-102	I-Pump-2	1795.80	1.59	0.00	2.87	1.61	1.61
P-89	J-53	J-54	1745.35	11.09	0.00	2.78	1.53	1.53
P-9	J-13	J-17	9196.68	6.18	0.00	4.17	1.55	1.55
P-90	J-86	i-472	23.27	0.01	0.00	0.15	0.01	0.01
P-91	J-89	J-90	884.50	6.72	0.00	2.51	1.55	1.55
P-92	J-62	J-104	10.04	0.06	0.00	0.26	0.08	0.08
P-93	J-64	J-65	44.70	3.37	0.00	1.14	1.30	1.30
P-94	J-98	J-99	1466.79	25.46	0.00	5.99	9.61	9.61
P-95	J-99	T-4	1300.50	24.70	0.00	8.30	22.80	22.80
P-96	J-100	J-106	4.49	0.02	0.00	0.11	0.02	0.02
P-97	J-4	J-107	64.02	0.02	0.00	0.18	0.01	0.01
P-99	J-68	J-80	1208.97	0.74	0.00	2.52	1.48	1.48

PUMP/LOSS ELEMENT RESULTS

NAME	INLET FLOWRATE gpm	OUTLET HEAD ft	PUMP HEAD ft	EFFIC- %	USEFUL HEAD Hp	INCREM- \$	MTL \$	TOTAL ft	#PUMPS	#PUMPS PARALLEL	NPSH SERIES	Case Avail.
P-HPEP-1	10447.18	-0.72	221.58	222.3	75.00	587.	29.2	29.2	**	**	32.4	0.0000
P-HPEP-2	10447.18	-0.72	221.58	222.3	75.00	587.	29.2	29.2	**	**	32.4	0.0000
P-HPEP-3	10447.18	-0.72	221.58	222.3	75.00	587.	29.2	29.2	**	**	32.4	0.0000
P-LPEP-1	6189.12	-0.72	221.58	222.3	75.00	348.	17.3	17.3	**	**	32.5	0.0000
Warning P2K107:Device P-SAR-1 is operating out of range.												
P-SAR-1	3560.95	14.94	52.17	37.2	75.00	34.	1.7	1.7	**	**	48.1	0.0000
Device "P-SAR-2" is closed												
P-SAR-2	0.00	14.95	52.16	0.0	75.00	0.	0.0	0.0	**	**	48.2	0.0000
Pump-2	1795.80	69.37	223.58	154.2	100.00	70.	2.6	2.6	**	**	102.4	0.0000
Pump-3	1129.81	64.03	239.11	175.1	0.75	50.	248.3	248.3	**	**	97.1	0.0000

NODE RESULTS

NODE NAME	NODE TITLE gpm	EXTERNAL DEMAND ft	HYDRAULIC GRADE ft	NODE ELEVATION ft	NODE PRESSURE HEAD psi	NODE PRESSURE
i-472	23.27	256.99	151.50	105.49	45.71	
J-10	1.32	236.20	37.30	198.90	86.19	
J-100	15.65	189.53	125.30	64.23	27.83	
J-101	17.39	189.48	125.40	64.08	27.77	
J-102	43.36	129.56	57.40	72.16	31.27	
J-104	10.04	251.46	117.30	134.16	58.14	
J-106	4.49	189.50	126.10	63.40	27.47	
J-107	64.02	223.71	45.00	178.71	77.44	
J-109	19.74	139.95	41.20	98.75	42.79	
J-11	6.90	109.04	41.20	67.84	29.40	
J-112	2.84	105.29	37.80	67.49	29.25	
J-12	0.00	231.89				
J-13	0.00	227.09	24.15	202.94	87.94	
J-14	1509.00	228.33	25.24	203.09	88.01	
J-15	0.00	218.22				
J-16	1.32	223.81	37.30	186.51	80.82	

J-17	9.00	220.91	32.20	188.71	81.77
J-18	0.00	192.75	42.24	150.51	65.22
J-19	115.93	207.32	35.60	171.72	74.41
J-20	148.00	181.81	34.24	147.57	63.95
J-21	14.73	286.63	68.80	217.83	94.39
J-23	27.83	183.67	35.90	147.77	64.03
J-24	29.05	154.94	34.40	120.54	52.24
J-25	41.71	146.03	33.10	112.93	48.94
J-3	-4867.00	14.04	5.00	9.04	3.92
J-32	0.32	138.62	72.10	66.52	28.83
J-34	1000.00	143.88	46.90	96.98	42.02
J-35	27.00	223.77	38.30	185.47	80.37
J-37	6.88	101.78	33.70	68.08	29.50
J-4	26.99	223.72	41.00	182.72	79.18
J-42	22.09	207.32	34.30	173.02	74.97
J-43	9.48	207.31	32.50	174.81	75.75
J-44	18.31	192.98	34.10	158.88	68.85
J-45	2.99	192.98	35.00	157.98	68.46
J-46	13.86	183.66	33.30	150.36	65.16
J-47	64.77	152.83	34.50	118.33	51.27
J-48	14.09	167.35	35.10	132.25	57.31
J-49	15.10	142.95	35.80	107.15	46.43
J-5	0.00	121.60	55.60	66.00	28.60
J-50	105.72	146.00	35.00	111.00	48.10
J-52	35.88	277.17	70.40	206.77	89.60
J-53	14.55	271.29	83.10	188.19	81.55
J-54	16.49	260.20	104.80	155.40	67.34
J-55	141.37	257.64	108.20	149.44	64.76
J-56	38.76	257.50	102.20	155.30	67.30
J-6	0.00	121.60	56.50	65.10	28.21
J-61	16.05	257.23	123.00	134.23	58.17
J-62	5.12	251.52	112.80	138.72	60.11
J-63	1.84	251.52	109.10	142.42	61.72
J-64	2.55	236.75	124.30	112.45	48.73
J-65	23.23	233.38	108.20	125.18	54.24
J-66	18.66	232.37	98.40	133.97	58.05
J-67	2.81	233.37	109.40	123.97	53.72
J-68	6.32	140.69	37.80	102.89	44.59
J-69	38.47	134.18	45.50	88.68	38.43
J-7	0.00	87.28			
J-70	12.72	124.61	56.10	68.51	29.69
J-71	27.16	280.95	83.70	197.25	85.47
J-73	2.39	269.44	121.40	148.04	64.15
J-75	34.72	283.84	75.20	208.64	90.41
J-77	4.45	282.35	79.50	202.85	87.90
J-8	0.00	99.89	33.98	65.92	28.56
J-80	0.76	139.95	39.10	100.85	43.70
J-81	31.79	291.81	62.70	229.11	99.28
J-83	22.97	266.17	124.10	142.07	61.57
J-84	24.17	266.16	122.10	144.06	62.43
J-85	10.88	261.64	140.00	121.64	52.71
J-86	35.90	257.01	153.20	103.81	44.98
J-89	12.91	252.79	170.00	82.79	35.87
J-90	10.14	246.06	181.20	64.86	28.11
J-95	7.47	124.61	54.00	70.61	30.60
J-98	1.65	215.16	133.20	81.96	35.52
J-99	128.77	189.70	120.90	68.80	29.81
O-P-HPEP-1	0.00	236.20	14.62	221.58	96.02
O-P-HPEP-2	0.00	236.20	14.62	221.58	96.02
O-P-HPEP-3	0.00	236.20	14.62	221.58	96.02

Appendix H

O-P-LPEP-1	0.00	236.20	14.62	221.58	96.02
I-P-SAR-1	0.00	50.06	35.12	14.94	6.48
I-P-SAR-2	0.00	50.07	35.12	14.95	6.48
I-Pump-2	0.00	127.97	58.60	69.37	30.06
O-Pump-3	0.00	295.11	56.00	239.11	103.61
T-1	----	50.07	34.75	15.32	6.64
T-3	----	13.90	5.00	8.90	3.86
T-4	----	165.00	118.70	46.30	20.06
T-5	----	245.00	184.70	60.30	26.13
I-P-HPEP-1	0.00	13.90	14.62	-0.72	-0.31
I-P-HPEP-2	0.00	13.90	14.62	-0.72	-0.31
I-P-HPEP-3	0.00	13.90	14.62	-0.72	-0.31
I-P-LPEP-1	0.00	13.90	14.62	-0.72	-0.31
O-P-SAR-1	0.00	87.29	35.12	52.17	22.61
O-P-SAR-2	0.00	87.28	35.12	52.16	22.60
O-Pump-2	0.00	282.18	58.60	223.58	96.89
I-Pump-3	0.00	120.03	56.00	64.03	27.74

MAXIMUM AND MINIMUM VALUES

PRESSURES

JUNCTION NUMBER	MAXIMUM PRESSURES	JUNCTION NUMBER	MINIMUM PRESSURES
psi		psi	
O-Pump-3	103.61	I-P-HPEP-1	-0.31
J-81	99.28	I-P-HPEP-2	-0.31
O-Pump-2	96.89	I-P-HPEP-3	-0.31
O-P-HPEP-1	96.02	I-P-LPEP-1	-0.31
O-P-HPEP-2	96.02	T-3	3.86

VELOCITIES

PIPE NUMBER	MAXIMUM VELOCITY	PIPE NUMBER	MINIMUM VELOCITY
(ft/s)		(ft/s)	
P-8	24.64	P-40	0.02
P-5	22.12	P-52	0.05
P-3	17.73	P-83	0.05
P-22	11.83	P-39	0.06
P-23	11.35	P-55	0.07

HL + ML / 1000

PIPE NUMBER	MAXIMUM HL+ML/1000	PIPE NUMBER	MINIMUM HL+ML/1000
(ft/ft)		(ft/ft)	
P-8	100.52	P-40	0.00
P-5	44.20	P-83	0.00
P-3	29.36	P-39	0.00
P-95	22.80	P-52	0.00
P-57	10.17	P-15	0.00

HL / 1000

Appendix H

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-8	100.52	P-40	0.00
P-5	44.20	P-83	0.00
P-3	29.36	P-39	0.00
P-95	22.80	P-52	0.00
P-57	10.17	P-15	0.00

SUMMARY OF INFLOWS AND OUTFLOWS

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
 (-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
T-1	-31191.71	
T-3	32663.66	
T-4	-1300.50	
T-5	-874.36	

NET SYSTEM INFLOW = 32663.66
 NET SYSTEM OUTFLOW = -33366.57
 NET SYSTEM DEMAND = -702.92

TOTAL POWER COST(\$) FOR THIS SIMULATION = 6788.53

***** HYDRAULIC ANALYSIS COMPLETED *****


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***** KYPIPE *****
*
* Pipe Network Modeling Software
*
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* Version: 9.023 06/04/2018
* Company: Ben Pak Serial #: 591177
* Interface: Classic
* Licensed for Pipe2016
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Date & Time: Wed Feb 27 15:59:32 2019

Master File : c:\users\user\onedrive\city of santa ana\model\model updates -feb 2019\pipe3irwd.KYP\pipe3irwd.P2K

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*****
SUMMARY OF ORIGINAL DATA
*****

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UNITS SPECIFIED

FLOWRATE = gallons/minute
HEAD (HGL) = feet
PRESSURE = psig

PIPELINE DATA

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1 #2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS	MINOR LOSS COEFF.
P-1	J-70 J-81	3232.61	6.00	150.0000	0.00
P-2	J-1a J-21	1336.25	12.00	150.0000	0.00
P-20	J-80 J-69	2155.95	6.00	150.0000	0.00
P-3	J-1a O-Pump-1	1047.74	12.00	150.0000	0.00
P-4	T-1 J-3	3973.55	12.00	150.0000	0.00
P-5	I-Pump-1 T-1	431.38	12.00	150.0000	0.00
P-64	J-21 J-75	1236.42	12.00	150.0000	0.00
P-65	J-69 J-70	3795.16	6.00	150.0000	0.00
P-66	J-71 J-73	5734.74	12.00	150.0000	0.00
P-72	J-81 J-1a	906.40	6.00	150.0000	0.00
P-73	J-75 J-77	700.71	12.00	150.0000	0.00
P-74	J-77 J-71	665.20	12.00	150.0000	0.00
P-75	J-73 J-83	1631.39	12.00	150.0000	0.00
P-76	J-83 J-84	492.67	8.00	100.1000	0.00
P-77	J-83 J-85	2480.15	12.00	150.0000	0.00
P-80	J-86 J-89	2650.79	12.00	150.0000	0.00
P-81	J-90 T-5	699.47	12.00	150.0000	0.00
P-83	J-70 J-95	1719.32	6.00	150.0000	0.00
P-84	J-85 J-86	2584.33	12.00	150.0000	0.00
P-90	J-86 i-472	964.49	8.00	150.0000	0.00

P-91 J-89 J-90 4338.08 12.00 150.0000 0.00

PUMP/LOSS ELEMENT DATA

THERE IS A PUMP AT NODE Pump-1; USEFUL POWER = 80.00 (Efficiency = 0.75%)

NODE DATA

NODE NAME	NODE TITLE (gpm)	EXTERNAL DEMAND (ft)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE
i-472	23.27	151.50		
J-1a	0.00	65.00		
J-21	14.73	68.80		
J-3	-2000.00	60.00		
J-69	38.47	45.50		
J-70	12.72	56.10		
J-71	27.16	83.70		
J-73	2.39	121.40		
J-75	34.72	75.20		
J-77	4.45	79.50		
J-80	0.76	39.10		
J-81	31.79	62.70		
J-83	22.97	124.10		
J-84	24.17	122.10		
J-85	10.88	140.00		
J-86	35.90	153.20		
J-89	12.91	170.00		
J-90	10.14	181.20		
J-95	7.47	54.00		
I-Pump-1	0.00	65.00		
T-1	----	56.00	70.00	
T-5	----	184.70	245.00	
O-Pump-1	0.00	65.00		

OUTPUT OPTION DATA

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

MAXIMUM AND MINIMUM PRESSURES = 5
MAXIMUM AND MINIMUM VELOCITIES = 5
MAXIMUM AND MINIMUM HEAD LOSS/1000 = 5

SYSTEM CONFIGURATION

NUMBER OF PIPES(P) = 21
NUMBER OF END NODES(J) = 20
NUMBER OF PRIMARY LOOPS(L) = 0
NUMBER OF SUPPLY NODES(F) = 2
NUMBER OF SUPPLY ZONES(Z) = 1

RESULTS OBTAINED AFTER 10 TRIALS: ACCURACY = 0.11934E-04

SIMULATION DESCRIPTION (LABEL)

PIPELINE RESULTS

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE #1	NODE #2	FLOWRATE LOSS	FLOWRATE LOSS	HEAD VELO.	MINOR VELO.	LINE 1000	HL+ML/ 1000	HL/ 1000
		gpm	ft	ft/s	ft/f	ft/f			
P-1	J-70	J-81	-59.42	0.99	0.00	0.67	0.31	0.31	
P-2	J-1a	J-21	1241.36	3.88	0.00	3.52	2.90	2.90	
P-20	J-80	J-69	-0.76	0.00	0.00	0.01	0.00	0.00	
P-3	J-1a	O-Pump-1	-1332.57	3.47	0.00	3.78	3.31	3.31	
P-4	T-1	J-3	-2000.00	27.91	0.00	5.67	7.02	7.02	
P-5	I-Pump-1	T-1	-1332.57	1.43	0.00	3.78	3.31	3.31	
P-64	J-21	J-75	1226.64	3.51	0.00	3.48	2.84	2.84	
P-65	J-69	J-70	-39.23	0.54	0.00	0.45	0.14	0.14	
P-66	J-71	J-73	1160.32	14.69	0.00	3.29	2.56	2.56	
P-72	J-81	J-1a	-91.21	0.61	0.00	1.03	0.67	0.67	
P-73	J-75	J-77	1191.92	1.89	0.00	3.38	2.69	2.69	
P-74	J-77	J-71	1187.47	1.78	0.00	3.37	2.67	2.67	
P-75	J-73	J-83	1157.93	4.16	0.00	3.28	2.55	2.55	
P-76	J-83	J-84	24.17	0.01	0.00	0.15	0.03	0.03	
P-77	J-83	J-85	1110.79	5.86	0.00	3.15	2.36	2.36	
P-80	J-86	J-89	1040.75	5.55	0.00	2.95	2.09	2.09	
P-81	J-90	T-5	1017.70	1.41	0.00	2.89	2.01	2.01	
P-83	J-70	J-95	7.47	0.01	0.00	0.08	0.01	0.01	
P-84	J-85	J-86	1099.92	6.00	0.00	3.12	2.32	2.32	
P-90	J-86	i-472	23.27	0.01	0.00	0.15	0.01	0.01	
P-91	J-89	J-90	1027.84	8.88	0.00	2.92	2.05	2.05	

PUMP/LOSS ELEMENT RESULTS

NAME	INLET FLOWRATE	OUTLET HEAD	PUMP HEAD	EFFIC-%	USEFUL HEAD	INCREM \$	MTL \$	TOTAL \$	#PUMPS	#PUMPS PARALLEL	NPSH SERIES	Case Avail.
	gpm	ft	ft	%	Hp	\$	\$	ft				
Pump-1	1332.57	3.57	241.08	237.5	0.75	80.	397.3	397.3	**	**	36.5	0.0000

NODE RESULTS

NODE NAME	NODE TITLE	EXTERNAL DEMAND	HYDRAULIC GRADE	NODE ELEVATION	PRESSURE HEAD	NODE PRESSURE
-----------	------------	-----------------	-----------------	----------------	---------------	---------------

	gpm	ft	ft	ft	psi
i-472	23.27	260.83	151.50	109.33	47.37
J-1a	0.00	302.61	65.00	237.61	102.97
J-21	14.73	298.73	68.80	229.93	99.64
J-3	-2000.00	97.91	60.00	37.91	16.43
J-69	38.47	300.48	45.50	254.98	110.49
J-70	12.72	301.02	56.10	244.92	106.13
J-71	27.16	291.56	83.70	207.86	90.07
J-73	2.39	276.86	121.40	155.46	67.37
J-75	34.72	295.22	75.20	220.02	95.34
J-77	4.45	293.34	79.50	213.84	92.66
J-80	0.76	300.48	39.10	261.38	113.26
J-81	31.79	302.00	62.70	239.30	103.70
J-83	22.97	272.70	124.10	148.60	64.39
J-84	24.17	272.68	122.10	150.58	65.25
J-85	10.88	266.84	140.00	126.84	54.96
J-86	35.90	260.84	153.20	107.64	46.64
J-89	12.91	255.29	170.00	85.29	36.96
J-90	10.14	246.41	181.20	65.21	28.26
J-95	7.47	301.00	54.00	247.00	107.04
I-Pump-1	0.00	68.57	65.00	3.57	1.55
T-1	----	70.00	56.00	14.00	6.07
T-5	----	245.00	184.70	60.30	26.13
O-Pump-1	0.00	306.08	65.00	241.08	104.47

MAXIMUM AND MINIMUM VALUES

PRESSURES

JUNCTION NUMBER	MAXIMUM PRESSURES	JUNCTION NUMBER	MINIMUM PRESSURES
	psi		psi
J-80	113.26	I-Pump-1	1.55
J-69	110.49	T-1	6.07
J-95	107.04	J-3	16.43
J-70	106.13	T-5	26.13
O-Pump-1	104.47	J-90	28.26

VELOCITIES

PIPE NUMBER	MAXIMUM VELOCITY	PIPE NUMBER	MINIMUM VELOCITY
	(ft/s)		(ft/s)
P-4	5.67	P-20	0.01
P-3	3.78	P-83	0.08
P-5	3.78	P-90	0.15
P-2	3.52	P-76	0.15
P-64	3.48	P-65	0.45

HL + ML / 1000

PIPE NUMBER	MAXIMUM HL+ML/1000	PIPE NUMBER	MINIMUM HL+ML/1000
	(ft/ft)		(ft/ft)

P-4	7.02	P-20	0.00
P-3	3.31	P-83	0.01
P-5	3.31	P-90	0.01
P-2	2.90	P-76	0.03
P-64	2.84	P-65	0.14

HL / 1000

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-4	7.02	P-20	0.00
P-3	3.31	P-83	0.01
P-5	3.31	P-90	0.01
P-2	2.90	P-76	0.03
P-64	2.84	P-65	0.14

SUMMARY OF INFLOWS AND OUTFLOWS

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
 (-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
T-1	-667.43	
T-5	-1017.70	

NET SYSTEM INFLOW = 0.00
 NET SYSTEM OUTFLOW = -1685.13
 NET SYSTEM DEMAND = -1685.13

TOTAL POWER COST(\$) FOR THIS SIMULATION = 7549.33

***** HYDRAULIC ANALYSIS COMPLETED *****

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***** KYPIPE *****
*
* Pipe Network Modeling Software      *
*
* CopyRighted by KYPIPE LLC (www.kypipe.com) *
* Version: 9.023 06/04/2018          *
* Company: Ben Pak   Serial #: 591177 *
* Interface: Classic                *
* Licensed for Pipe2016              *
*
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Date & Time: Wed Feb 27 15:57:07 2019

Master File : c:\users\user\onedrive\city of santa ana\model\model updates -feb 2019\pipe4a.KYP\pipe4a.P2K

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*****
SUMMARY OF ORIGINAL DATA
*****

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UNITS SPECIFIED

FLOWRATE = gallons/minute
HEAD (HGL) = feet
PRESSURE = psig

PIPELINE DATA

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES		LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
	#1	#2				

P-1	O-220Pump-	T-1	324.16	8.00	150.0000	0.00
P-106	J-80	J-120	648.08	4.00	150.0000	0.00
P-107	J-76	J-78	1335.20	6.00	150.0000	0.00
P-108	J-75	J-76	1323.88	6.00	100.1000	0.00
P-109	J-75	J-1	2325.69	4.00	150.0000	0.00
P-110	J-122	J-71	846.44	4.00	150.0000	0.00
P-2	R-1I-220Pump-		358.19	8.00	150.0000	0.00
P-3	T-1	J-3	1378.07	8.00	150.0000	0.00
P-58	J-71	J-72	1292.73	4.00	150.0000	0.00
P-59	J-72	J-73	4137.03	4.00	150.0000	0.00
P-60	J-71	J-74	281.73	4.00	150.0000	0.00
P-61	J-72	J-75	2521.30	6.00	150.0000	0.00
P-62	J-76	J-3	2346.37	8.00	150.0000	0.00
P-63	J-78	J-79	3685.66	4.00	150.0000	0.00
P-64	J-78	J-80	2633.42	6.00	150.0000	0.00

PUMP/LOSS ELEMENT DATA

THERE IS A PUMP AT NODE 220Pump-1; USEFUL POWER = 30.00 (Efficiency = 100.00%)

N O D E D A T A

NODE NAME	NODE TITLE (gpm)	EXTERNAL DEMAND (ft)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE
I-220Pump-		0.00	80.00	
J-1	32.08	68.20		
J-120	72.63	84.70		
J-122	0.65	83.40		
J-3	140.56	80.90		
J-71	1.89	68.40		
J-72	7.73	66.40		
J-73	19.94	58.50		
J-74	2.39	69.60		
J-75	2.69	71.80		
J-76	0.05	74.60		
J-78	12.06	77.90		
J-79	10.22	74.80		
J-80	11.79	86.90		
R-1	----	80.00	80.00	
T-1	----	80.00	250.00	
O-220Pump-		0.00	80.00	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

MAXIMUM AND MINIMUM PRESSURES = 5
MAXIMUM AND MINIMUM VELOCITIES = 5
MAXIMUM AND MINIMUM HEAD LOSS/1000 = 5

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES(P) = 15
NUMBER OF END NODES(J) = 14
NUMBER OF PRIMARY LOOPS(L) = 0
NUMBER OF SUPPLY NODES(F) = 2
NUMBER OF SUPPLY ZONES(Z) = 1

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RESULTS OBTAINED AFTER 11 TRIALS: ACCURACY = 0.27653E-04

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

PIPELINE RESULTS

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS		FLOWRATE		HEAD		MINOR	LINE	HL+ML/	HL/
	#1	#2	LOSS	LOSS	VELO.	1000	1000			
			gpm	ft	ft/s	ft/f	ft/f			
P-1	O-220Pump-	T-1	679.48	2.22	0.00	4.34	6.85	6.85		
P-106	J-80	J-120	72.63	2.07	0.00	1.85	3.19	3.19		
P-107	J-76	J-78	106.71	1.20	0.00	1.21	0.90	0.90		
P-108	J-75	J-76	-67.36	1.08	0.00	0.76	0.81	0.81		
P-109	J-75	J-1	32.08	1.63	0.00	0.82	0.70	0.70		
P-110	J-122	J-71	-0.65	0.00	0.00	0.02	0.00	0.00		
P-2	R-1I-220Pump-		679.48	2.45	0.00	4.34	6.85	6.85		
P-3	T-1	J-3	314.67	2.27	0.00	2.01	1.65	1.65		
P-58	J-71	J-72	-4.92	0.03	0.00	0.13	0.02	0.02		
P-59	J-72	J-73	19.94	1.20	0.00	0.51	0.29	0.29		
P-60	J-71	J-74	2.39	0.00	0.00	0.06	0.01	0.01		
P-61	J-72	J-75	-32.59	0.25	0.00	0.37	0.10	0.10		
P-62	J-76	J-3	-174.12	1.29	0.00	1.11	0.55	0.55		
P-63	J-78	J-79	10.22	0.31	0.00	0.26	0.08	0.08		
P-64	J-78	J-80	84.43	1.54	0.00	0.96	0.58	0.58		

PUMP/LOSS ELEMENT RESULTS

NAME	INLET FLOWRATE	OUTLET HEAD	PUMP HEAD	EFFIC- HEAD	USEFUL ENCY	INCREMTL POWER	TOTAL COST	#PUMPS	#PUMPS	NPSH	Case Avail.
	gpm	ft	ft	%	Hp	\$	\$			ft	
220Pump-1	679.48	-2.45	172.22	174.7	100.00	30.	1.1	1.1	**	**	30.5 0.0000

NODE RESULTS

NODE NAME	NODE TITLE	EXTERNAL DEMAND	HYDRAULIC GRADE	NODE ELEVATION	PRESSURE HEAD	NODE PRESSURE
		gpm	ft	ft	psi	
I-220Pump-		0.00	77.55	80.00	-2.45	-1.06
J-1		32.08	243.73	68.20	175.53	76.06
J-120		72.63	241.63	84.70	156.93	68.00
J-122		0.65	245.08	83.40	161.68	70.06
J-3		140.56	247.73	80.90	166.83	72.29
J-71		1.89	245.08	68.40	176.68	76.56
J-72		7.73	245.11	66.40	178.71	77.44
J-73		19.94	243.91	58.50	185.41	80.34
J-74		2.39	245.08	69.60	175.48	76.04
J-75		2.69	245.36	71.80	173.56	75.21
J-76		0.05	246.44	74.60	171.84	74.46
J-78		12.06	245.23	77.90	167.33	72.51
J-79		10.22	244.92	74.80	170.12	73.72

J-80	11.79	243.70	86.90	156.80	67.94
R-1	----	80.00	80.00	0.00	0.00
T-1	----	250.00	80.00	170.00	73.67
O-220Pump-		0.00	252.22	80.00	172.22 74.63

MAXIMUM AND MINIMUM VALUES

PRESSURES

JUNCTION NUMBER	MAXIMUM PRESSURES	JUNCTION NUMBER	MINIMUM PRESSURES
	psi		psi
J-73	80.34	I-220Pump-1	-1.06
J-72	77.44	J-80	67.94
J-71	76.56	J-120	68.00
J-1	76.06	J-122	70.06
J-74	76.04	J-3	72.29

VELOCITIES

PIPE NUMBER	MAXIMUM VELOCITY	PIPE NUMBER	MINIMUM VELOCITY
	(ft/s)		(ft/s)
P-1	4.34	P-110	0.02
P-2	4.34	P-60	0.06
P-3	2.01	P-58	0.13
P-106	1.85	P-63	0.26
P-107	1.21	P-61	0.37

HL + ML / 1000

PIPE NUMBER	MAXIMUM HL+ML/1000	PIPE NUMBER	MINIMUM HL+ML/1000
	(ft/ft)		(ft/ft)
P-1	6.85	P-110	0.00
P-2	6.85	P-60	0.01
P-106	3.19	P-58	0.02
P-3	1.65	P-63	0.08
P-107	0.90	P-61	0.10

HL / 1000

PIPE NUMBER	MAXIMUM HL/1000	PIPE NUMBER	MINIMUM HL/1000
	(ft/ft)		(ft/ft)
P-1	6.85	P-110	0.00
P-2	6.85	P-60	0.01
P-106	3.19	P-58	0.02
P-3	1.65	P-63	0.08
P-107	0.90	P-61	0.10

SUMMARY OF INFLOWS AND OUTFLOWS

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
R-1	679.48	
T-1	-364.80	

NET SYSTEM INFLOW = 679.48
NET SYSTEM OUTFLOW = -364.80
NET SYSTEM DEMAND = 314.67

=====

TOTAL POWER COST(\$) FOR THIS SIMULATION = 3.35

***** HYDRAULIC ANALYSIS COMPLETED *****

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***** KYPIPE *****
*
* Pipe Network Modeling Software      *
*
* CopyRighted by KYPIPE LLC (www.kypipe.com) *
* Version: 9.023 06/04/2018          *
* Company: Ben Pak   Serial #: 591177 *
* Interface: Classic                *
* Licensed for Pipe2016              *
*
*****

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Date & Time: Wed Feb 27 15:58:17 2019

Master File : c:\users\user\onedrive\city of santa ana\model\model updates -feb 2019\pipe4b.KYP\pipe4b.P2K

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*****
SUMMARY OF ORIGINAL DATA
*****

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UNITS SPECIFIED

FLOWRATE = gallons/minute
HEAD (HGL) = feet
PRESSURE = psig

PIPELINE DATA

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES		LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
	#1	#2				
P-106	J-80	J-120	648.08	4.00	150.0000	0.00
P-107	J-76	J-78	1335.20	6.00	150.0000	0.00
P-108	J-75	J-76	1323.88	6.00	150.0000	0.00
P-109	J-75	J-1	2325.69	4.00	150.0000	0.00
P-110	J-122	J-71	846.44	8.00	150.0000	0.00
P-4	J-122	T-2	363.29	10.00	148.3553	0.00
P-5	T-2	O-Pump-1	154.17	10.00	148.3553	0.00
P-58	J-71	J-72	1292.73	8.00	150.0000	0.00
P-59	J-72	J-73	4137.03	4.00	150.0000	0.00
P-6	I-Pump-1	R-1	116.63	10.00	148.3553	0.00
P-60	J-71	J-74	281.73	4.00	150.0000	0.00
P-61	J-72	J-75	2521.30	6.00	150.0000	0.00
P-62	J-76	J-3	2346.37	6.00	150.0000	0.00
P-63	J-78	J-79	3685.66	4.00	150.0000	0.00
P-64	J-78	J-80	2633.42	6.00	150.0000	0.00

PUMP/LOSS ELEMENT DATA

THERE IS A PUMP AT NODE Pump-1; USEFUL POWER = 30.00 (Efficiency = 100.00%)

N O D E D A T A

NODE NAME	NODE TITLE (gpm)	EXTERNAL DEMAND (ft)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE
J-1	32.08	68.20		
J-120	72.63	84.70		
J-122	0.65	83.40		
J-3	140.56	80.90		
J-71	1.89	68.40		
J-72	7.73	66.40		
J-73	19.94	58.50		
J-74	2.39	69.60		
J-75	2.69	71.80		
J-76	0.05	74.60		
J-78	12.06	77.90		
J-79	10.22	74.80		
J-80	11.79	86.90		
I-Pump-1	0.00	81.00		
R-1	----	81.00	81.00	
T-2	----	81.00	285.00	
O-Pump-1	0.00	81.00		

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

MAXIMUM AND MINIMUM PRESSURES = 5
MAXIMUM AND MINIMUM VELOCITIES = 5
MAXIMUM AND MINIMUM HEAD LOSS/1000 = 5

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES(P) = 15
NUMBER OF END NODES(J) = 14
NUMBER OF PRIMARY LOOPS(L) = 0
NUMBER OF SUPPLY NODES(F) = 2
NUMBER OF SUPPLY ZONES(Z) = 1

=====

RESULTS OBTAINED AFTER 12 TRIALS: ACCURACY = 0.59134E-07

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

PIPELINE RESULTS

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS		FLOWRATE			HEAD		MINOR 1000	LINE 1000	HL+ML/ HL/
	#1	#2	LOSS	LOSS	VELO.	ft	ft			
			gpm	ft	ft/s	ft/f	ft/f			
P-106	J-80	J-120	72.63	2.07	0.00	1.85	3.19	3.19		
P-107	J-76	J-78	106.71	1.20	0.00	1.21	0.90	0.90		
P-108	J-75	J-76	247.32	5.67	0.00	2.81	4.28	4.28		
P-109	J-75	J-1	32.08	1.63	0.00	0.82	0.70	0.70		
P-110	J-122	J-71	314.03	1.39	0.00	2.00	1.64	1.64		
P-4	J-122	T-2	-314.67	0.21	0.00	1.29	0.57	0.57		
P-5	T-2	O-Pump-1	-580.44	0.27	0.00	2.37	1.76	1.76		
P-58	J-71	J-72	309.75	2.07	0.00	1.98	1.60	1.60		
P-59	J-72	J-73	19.94	1.20	0.00	0.51	0.29	0.29		
P-6	I-Pump-1	R-1	-580.44	0.21	0.00	2.37	1.76	1.76		
P-60	J-71	J-74	2.39	0.00	0.00	0.06	0.01	0.01		
P-61	J-72	J-75	282.08	13.76	0.00	3.20	5.46	5.46		
P-62	J-76	J-3	140.56	3.53	0.00	1.59	1.50	1.50		
P-63	J-78	J-79	10.22	0.31	0.00	0.26	0.08	0.08		
P-64	J-78	J-80	84.43	1.54	0.00	0.96	0.58	0.58		

PUMP/LOSS ELEMENT RESULTS

NAME	INLET FLOWRATE	OUTLET HEAD	PUMP HEAD	EFFIC- %	USEFUL HEAD	INCREMTL ENCY	TOTAL POWER	#PUMPS	#PUMPS PARALLEL	NPSH SERIES	Case Avail.
	gpm	ft	ft		Hp	\$	\$				
Pump-1	580.44	-0.21	204.27	204.5	100.00	30.11	1.1	**	**	32.9	0.0000

NODE RESULTS

NODE NAME	NODE TITLE	EXTERNAL DEMAND	HYDRAULIC GRADE	NODE ELEVATION	PRESSURE HEAD	NODE PRESSURE
		gpm	ft	ft	psi	
J-1		32.08	265.94	68.20	197.74	85.69
J-120		72.63	257.10	84.70	172.40	74.71
J-122		0.65	284.79	83.40	201.39	87.27
J-3		140.56	258.38	80.90	177.48	76.91
J-71		1.89	283.41	68.40	215.01	93.17
J-72		7.73	281.34	66.40	214.94	93.14
J-73		19.94	280.13	58.50	221.63	96.04
J-74		2.39	283.40	69.60	213.80	92.65
J-75		2.69	267.57	71.80	195.77	84.84
J-76		0.05	261.91	74.60	187.31	81.17
J-78		12.06	260.70	77.90	182.80	79.21
J-79		10.22	260.39	74.80	185.59	80.42
J-80		11.79	259.16	86.90	172.26	74.65
I-Pump-1		0.00	80.79	81.00	-0.21	-0.09

R-1	----	81.00	81.00	0.00	0.00	
T-2	----	285.00	81.00	204.00	88.40	
O-Pump-1		0.00	285.27	81.00	204.27	88.52

MAXIMUM AND MINIMUM VALUES

PRESSURES

JUNCTION NUMBER	MAXIMUM PRESSURES	JUNCTION NUMBER	MINIMUM PRESSURES
	psi		psi
J-73	96.04	I-Pump-1	-0.09
J-71	93.17	J-80	74.65
J-72	93.14	J-120	74.71
J-74	92.65	J-3	76.91
O-Pump-1	88.52	J-78	79.21

VELOCITIES

PIPE NUMBER	MAXIMUM VELOCITY	PIPE NUMBER	MINIMUM VELOCITY
	(ft/s)		(ft/s)
P-61	3.20	P-60	0.06
P-108	2.81	P-63	0.26
P-5	2.37	P-59	0.51
P-6	2.37	P-109	0.82
P-110	2.00	P-64	0.96

HL + ML / 1000

PIPE NUMBER	MAXIMUM HL+ML/1000	PIPE NUMBER	MINIMUM HL+ML/1000
	(ft/ft)		(ft/ft)
P-61	5.46	P-60	0.01
P-108	4.28	P-63	0.08
P-106	3.19	P-59	0.29
P-5	1.76	P-4	0.57
P-6	1.76	P-64	0.58

HL / 1000

PIPE NUMBER	MAXIMUM HL/1000	PIPE NUMBER	MINIMUM HL/1000
	(ft/ft)		(ft/ft)
P-61	5.46	P-60	0.01
P-108	4.28	P-63	0.08
P-106	3.19	P-59	0.29
P-5	1.76	P-4	0.57
P-6	1.76	P-64	0.58

SUMMARY OF INFLOWS AND OUTFLOWS

Appendix H

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
R-1	580.44	
T-2	-265.77	

NET SYSTEM INFLOW = 580.44
NET SYSTEM OUTFLOW = -265.77
NET SYSTEM DEMAND = 314.67

=====

TOTAL POWER COST(\$) FOR THIS SIMULATION = 3.35

***** HYDRAULIC ANALYSIS COMPLETED *****



CITY OF SANTA ANA
RECYCLED WATER CAPITAL PROJECTS BUDGET
FY 2020/21

Project Name:	Recycled Water Facilities - Phase 1 - Project No. 1		
Asset Classification:	New Construction		
Asset Category:	New Construction		
Budget ID No. 101	CO No.		

Description: Project consists of new recycled water pipelines in Harbor Boulevard, Segerstrom Avenue, and South Groody Way. All work to be done in City streets.



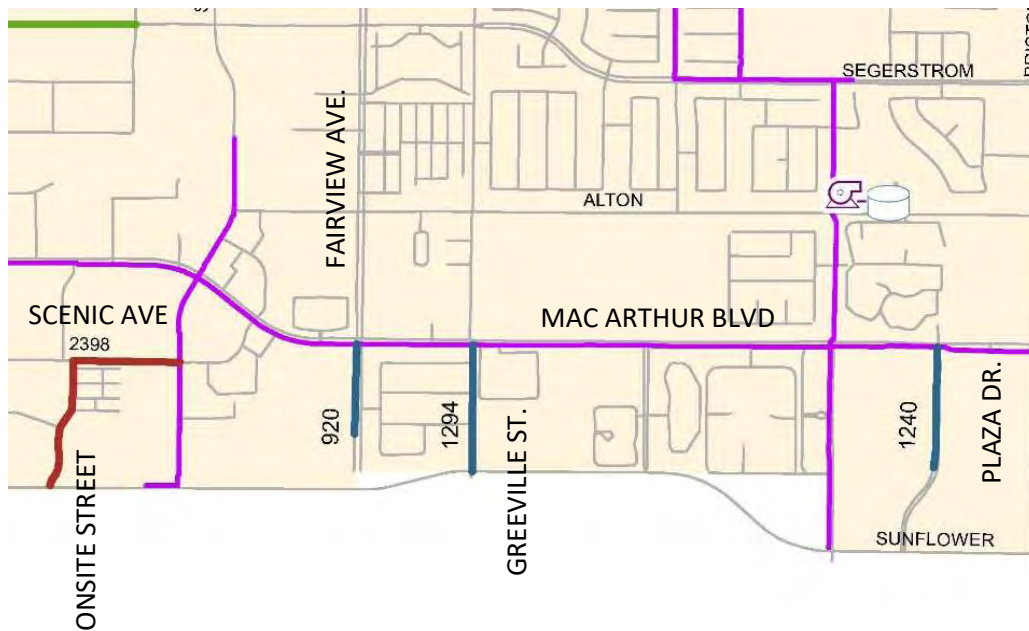
Description	Quantity	Units	Unit Cost	Cost
4-inch pipeline		Feet	\$ 90	\$ -
6-inch pipeline	2,678	Feet	\$ 90	\$ 241,020
8-inch Pipeline		Feet	\$ 120	\$ -
12-inch Pipeline	1,864	Feet	\$ 180	\$ 335,520
Construction Subtotal:				\$ 576,540
Contingency, percent	30%			\$ 172,962
Construction Total:				\$ 749,502
Engineering, Inspection, Soils, and Survey	40%			\$ 299,801
Total Capital Costs:				\$ 1,049,303
Total Capital Budget (round to nearest \$10,000):				\$ 1,050,000



CITY OF SANTA ANA
RECYCLED WATER CAPITAL PROJECTS BUDGET
FY 2020/21

Project Name:	Recycled Water Facilities - Phase 1 - Project No. 2
Asset Classification:	New Construction
Asset Category:	New Construction
Budget ID No. 102	CO No.

Description: Project consists of new recycled water pipelines in Onsite Commercial Street, Fairview Avenue, Greenville Street, and Plaza Drive. All work to be done in City streets or dedicated easements.



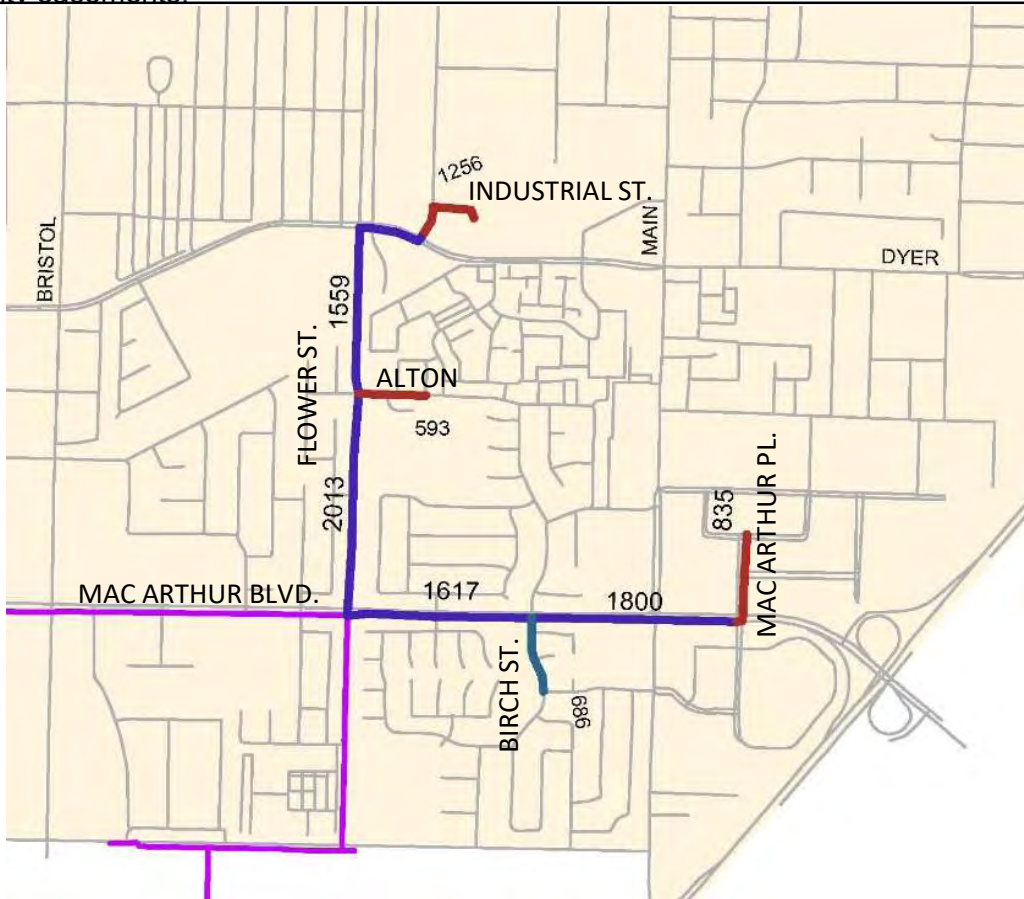
Description	Quantity	Units	Unit Cost	Cost
4-inch pipeline	3,454	Feet	\$ 90	\$ 310,860
6-inch pipeline		Feet	\$ 90	\$ -
8-inch Pipeline	2,398	Feet	\$ 120	\$ 287,760
12-inch Pipeline		Feet	\$ 180	\$ -
Construction Subtotal:				\$ 598,620
Contingency, percent	30%			\$ 179,586
Construction Total:				\$ 778,206
Engineering, Inspection, Soils, and Survey	40%			\$ 311,282
Total Capital Costs:				\$ 1,089,488
Total Capital Budget (round to nearest \$10,000):				\$ 1,090,000



CITY OF SANTA ANA
RECYCLED WATER CAPITAL PROJECTS BUDGET
FY 2020/21

Project Name:	Recycled Water Facilities - Phase 1 - Project No. 3		
Asset Classification:	New Construction		
Asset Category:	New Construction		
Budget ID No. 103	CO No.		

Description: Project consists of new recycled water pipelines in Flower Street, Industrail Access Street, Alton Avenue, Birch Street, and MacArthur Place. All work to be done in City streets or in dedicated City easements.



Description	Quantity	Units	Unit Cost	Cost
4-inch pipeline	989	Feet	\$ 90	\$ 89,010
6-inch pipeline		Feet	\$ 90	\$ -
8-inch Pipeline	2,684	Feet	\$ 120	\$ 322,080
12-inch Pipeline	6,989	Feet	\$ 180	\$ 1,258,020
Construction Subtotal:				\$ 1,669,110
Contingency, percent	30%			\$ 500,733
Construction Total:				\$ 2,169,843
Engineering, Inspection, Soils, and Survey	40%			\$ 867,937
Total Capital Costs:				\$ 3,037,780
Total Capital Budget (round to nearest \$10,000):				\$ 3,040,000



CITY OF SANTA ANA
RECYCLED WATER CAPITAL PROJECTS BUDGET
FY 2020/21

Project Name:	Recycled Water Facilities - Phase 2 - Project No. 1
Asset Classification:	New Construction
Asset Category:	New Construction
Budget ID No. 201	CO No.

Description: Project consists of new recycled water pipelines in Fairview Avenue, 1st Street, Shelton Street, Walnut Street, Fower Street, Memory Lane. The project will also include a pump station and reservoir. All work to be done in City streets or on City owned property.



Description	Quantity	Units	Unit Cost	Cost
4-inch pipeline		Feet	\$ 90	\$ -
6-inch pipeline		Feet	\$ 90	\$ -
8-inch Pipeline	1,096	Feet	\$ 120	\$ 131,520
10-inch Pipeline	2,650	Feet	\$ 120	\$ 318,000
12-inch Pipeline	7,897	Feet	\$ 180	\$ 1,421,460
16-inch Pipeline	16,933	Feet	\$ 200	\$ 3,386,600
25 HP Package Pump Station	1	LS	\$ 30,000	\$ 30,000
Reservoir	50,000	Gallon	\$ 10	\$ 500,000
Construction Total:				\$ 5,787,580
Contingency, percent	30%			\$ 1,736,274
Construction Total:				\$ 8,023,854
Engineering, Inspection, Soils, and Survey	40%			\$ 3,209,542
Total Capital Costs:				\$ 11,233,396
Total Capital Budget (round to nearest \$10,000):				\$ 11,240,000



CITY OF SANTA ANA
RECYCLED WATER CAPITAL PROJECTS BUDGET
FY 2020/21

Project Name:	Recycled Water Facilities - Phase 2 - Project No. 2
Asset Classification:	New Construction
Asset Category:	New Construction
Budget ID No. 202	CO No.

Description: Project consists of new recycled water pipelines in Flower Street, Myrtle Street, 1st Street, Santa Ana Boulevard, and Civic Center Drive. All work to be done in City streets.



Description	Quantity	Units	Unit Cost	Cost
4-inch pipeline	7,047	Feet	\$ 90	\$ 634,230
6-inch pipeline	1,479	Feet	\$ 90	\$ 133,110
8-inch Pipeline		Feet	\$ 120	\$ -
10-inch Pipeline		Feet	\$ 120	\$ -
12-inch Pipeline		Feet	\$ 180	\$ -
16-inch Pipeline		Feet	\$ 200	\$ -
25 HP Package Pump Station		LS	\$ 30,000	\$ -
Reservoir		Gallon	\$ 10	\$ -
Construction Total:				\$ 767,340
Contingency, percent	30%			\$ 230,202
Construction Total:				\$ 997,542
Engineering, Inspection, Soils, and Survey	40%			\$ 399,017
Total Capital Costs:				\$ 1,396,559
Total Capital Budget (round to nearest \$10,000):				\$ 1,400,000



CITY OF SANTA ANA
RECYCLED WATER CAPITAL PROJECTS BUDGET
FY 2020/21

Project Name:	Recycled Water Facilities - Phase 2 - Project No. 3		
Asset Classification:	New Construction		
Asset Category:	New Construction		
Budget ID No. 203	CO No.		

Description: Project consists of new recycled water pipelines in 17th Street, Bristol Street, Orange Road, and Hesperian Street. All work to be done in City streets.



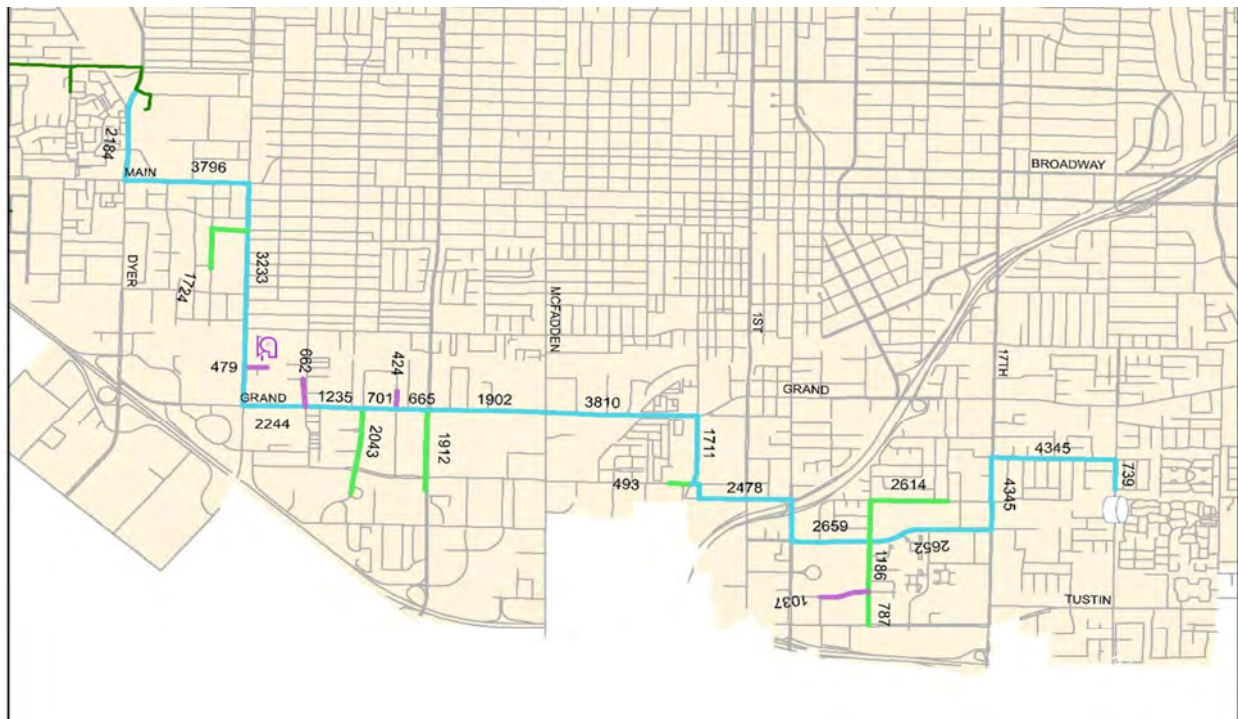
Description	Quantity	Units	Unit Cost	Cost
4-inch pipeline	8,603	Feet	\$ 90	\$ 774,270
6-inch pipeline	1,320	Feet	\$ 90	\$ 118,800
8-inch Pipeline		Feet	\$ 120	\$ -
10-inch Pipeline		Feet	\$ 120	\$ -
12-inch Pipeline		Feet	\$ 180	\$ -
16-inch Pipeline		Feet	\$ 200	\$ -
25 HP Package Pump Station		LS	\$ 30,000	\$ -
Reservoir		Gallon	\$ 10	\$ -
Construction Total:				\$ 893,070
Contingency, percent	30%			\$ 267,921
Construction Total:				\$ 1,160,991
Engineering, Inspection, Soils, and Survey	40%			\$ 464,396
Total Capital Costs:				\$ 1,625,387
Total Capital Budget (round to nearest \$10,000):				\$ 1,630,000



CITY OF SANTA ANA
RECYCLED WATER CAPITAL PROJECTS BUDGET
FY 2020/21

Project Name:	Recycled Water Facilities - Phase 3 - Project No. 1
Asset Classification:	New Construction
Asset Category:	New Construction
Budget ID No. 301	CO No.

Description: Project consists of new recycled water pipelines in Main Street, Warner Avenue, Grand Avenue, Chestnut Avenue, Elk Lane, 4th Street, Cabrillo Park Drive, 17th Street, Wright Street, and Santa Clara Avenue, a pump station and reservoir. All work to be done in City streets or on City owned property.



Description	Quantity	Units	Unit Cost	Cost
4-inch pipeline		Feet	\$ 90	\$ -
6-inch pipeline		Feet	\$ 90	\$ -
8-inch Pipeline		Feet	\$ 120	\$ -
12-inch Pipeline	38,699	Feet	\$ 180	\$ 6,965,820
25 HP Package Pump Station	1	LS	\$ 30,000	\$ 30,000
Reservoir	50,000	Gallon	\$ 10	\$ 500,000
Construction Total:				\$ 7,495,820
Contingency, percent	30%			\$ 2,248,746
Construction Total:				\$ 9,744,566
Engineering, Inspection, Soils, and Survey	40%			\$ 3,897,826
Total Capital Costs:				\$ 13,642,392
Total Capital Budget (round to nearest \$10,000):				\$ 13,650,000



CITY OF SANTA ANA
RECYCLED WATER CAPITAL PROJECTS BUDGET
FY 2020/21

Project Name:	Recycled Water Facilities - Phase 3 - Project No. 2
Asset Classification:	New Construction
Asset Category:	New Construction
Budget ID No. 302	CO No.

Description: Project consists of new recycled water pipelines in St. Andrew Place, St. Gertrude Place, Pomona Avenue, Edinger Avenue, Orange Avenue, and Central Avenue. All work to be done in City streets.



Description	Quantity	Units	Unit Cost	Cost
4-inch pipeline	1,565	Feet	\$ 90	\$ 140,850
6-inch pipeline	5,679	Feet	\$ 90	\$ 511,110
8-inch Pipeline		Feet	\$ 120	\$ -
12-inch Pipeline		Feet	\$ 180	\$ -
25 HP Package Pump Station		LS	\$ 30,000	\$ -
Reservoir		Gallon	\$ 10	\$ -
Construction Total:				\$ 651,960
Contingency, percent	30%			\$ 195,588
Construction Total:				\$ 847,548
Engineering, Inspection, Soils, and Survey	40%			\$ 339,019
Total Capital Costs:				\$ 1,186,567
Total Capital Budget (round to nearest \$10,000):				\$ 1,190,000



CITY OF SANTA ANA
RECYCLED WATER CAPITAL PROJECTS BUDGET
FY 2020/21

Project Name:	Recycled Water Facilities - Phase 3 - Project No. 3		
Asset Classification:	New Construction		
Asset Category:	New Construction		
Budget ID No. 303	CO No.		

Description: Project consists of new recycled water pipelines in Maybury Street, Fruit Street, Park Center Drive, and Lyon Street. All work to be done in City streets.



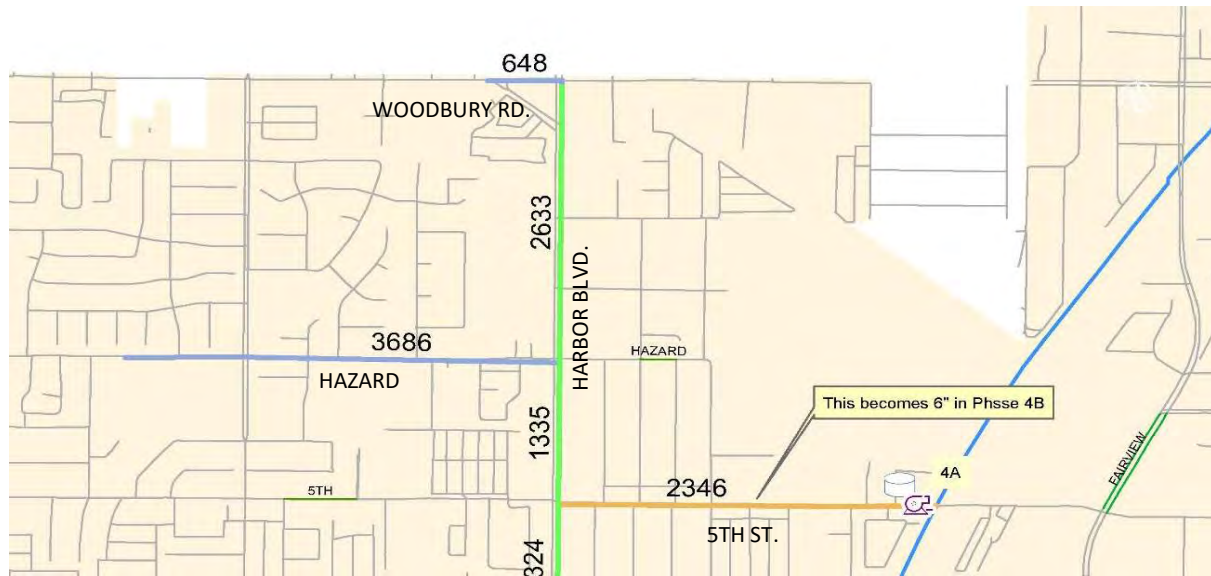
Description	Quantity	Units	Unit Cost	Cost
4-inch pipeline	1,037	Feet	\$ 90	\$ 93,330
6-inch pipeline	5,080	Feet	\$ 90	\$ 457,200
8-inch Pipeline		Feet	\$ 120	\$ -
12-inch Pipeline		Feet	\$ 180	\$ -
25 HP Package Pump Station		LS	\$ 30,000	\$ -
Reservoir		Gallon	\$ 10	\$ -
Construction Total:				\$ 550,530
Contingency, percent	30%			\$ 165,159
Construction Total:				\$ 715,689
Engineering, Inspection, Soils, and Survey	40%			\$ 286,276
Total Capital Costs:				\$ 1,001,965
Total Capital Budget (round to nearest \$10,000):				\$ 1,010,000



CITY OF SANTA ANA
RECYCLED WATER CAPITAL PROJECTS BUDGET
FY 2020/21

Project Name:	Recycled Water Facilities - Phase 4 - Project No. 1
Asset Classification:	New Construction
Asset Category:	New Construction
Budget ID No. 401	CO No.

Description: Project consists of new recycled water pipelines in Harbor Boulevard, Woodbury Road, Hazard Avenue, and 5th Street. It also includes a reservoir and pump station. All work to be done in City streets or on City owned property.



Description	Quantity	Units	Unit Cost	Cost
4-inch pipeline	4,334	Feet	\$ 90	\$ 390,060
6-inch pipeline	3,968	Feet	\$ 90	\$ 357,120
8-inch Pipeline	2,346	Feet	\$ 120	\$ 281,520
30 HP Package Pump Station	1	LS	\$ 50,000	\$ 50,000
Reservoir	50,000	Gallon	\$ 10	\$ 500,000
Construction Total:				\$ 1,578,700
Contingency, percent	30%			\$ 473,610
Construction Total:				\$ 2,052,310
Engineering, Inspection, Soils, and Survey	40%			\$ 820,924
Total Capital Costs:				\$ 2,873,234
Total Capital Budget (round to nearest \$10,000):				\$ 2,880,000



CITY OF SANTA ANA
RECYCLED WATER CAPITAL PROJECTS BUDGET
FY 2020/21

Project Name:	Recycled Water Facilities - Phase 4 - Project No. 2		
Asset Classification:	New Construction		
Asset Category:	New Construction		
Budget ID No. 402	CO No.		

Description: Project consists of new recycled water pipelines in Harbor Boulevard, 1st Street, and McFadden Avenue. All work to be done in City streets.



Description	Quantity	Units	Unit Cost	Cost
4-inch pipeline	8,038	Feet	\$ 90	\$ 723,420
6-inch pipeline	3,845	Feet	\$ 90	\$ 346,050
8-inch Pipeline		Feet	\$ 120	\$ -
30 HP Package Pump Station		LS	\$ 50,000	\$ -
Reservoir		Gallon	\$ 10	\$ -
Construction Total:				\$ 1,069,470
Contingency, percent	30%			\$ 320,841
Construction Total:				\$ 1,390,311
Engineering, Inspection, Soils, and Survey	40%			\$ 556,124
Total Capital Costs:				\$ 1,946,435
Total Capital Budget (round to nearest \$10,000):				\$ 1,950,000